Australian Government
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A literature review on assessing and evaluating government-led business advisory services and their impact

International literature review and scoping study of business advisory services project

UTS Business Research Team

Renu Agarwal
Christopher Bajada
Wen Helena Li
Sanjoy Paul
Phillip Toner
Roy Green
Sancheeta Pugalia
Phi Yen Phan

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Executive summary

Purpose of the review

This study provides a literature review of 30 government-led business advisory services across 11 nations and country groupings. Its purpose is to describe the range of these activities and their impact on business performance and capability, drawing on evaluations of these services. The review also considers the advantages and disadvantages of different approaches to delivering and evaluating business advisory services.

A typology of government-supported business advisory services

Rationale for government-supported business advisory services

All the business advisory programs we examined identified some form of 'market failure' as their justification. The most common impediment related to difficulties in, and/or the expense of, accessing and processing information about matters such as setting up a business, entering/expanding export markets or identifying/accessing/adapting technology.

Program objectives

Most programs have multiple objectives, reflecting the great variety of market failures that constitute the rationale for business assistance and advice. However diffuse, all programs aim to support economic development. We identified 5 categories of program objectives:

(i) lifting firm and/or industry innovation, efficiency and productivity

(ii) increasing the rate of new firm creation, notably through assistance to start-ups, and encouraging entrepreneurship

(iii) expanding existing firms

(iv) increasing firm exports

(v) improving inter-firm collaboration as a means of promoting diffusion of technical and market intelligence.

What firm demographics and industries/sectors receive assistance?

A wide range of industries, sectors and activities are identified as having market failures. The principal targets of business advisory programs are Small and Medium Enterprises (SMEs) and 'start-ups' (with two main types identified). Universities and public research institutes are also commonly supported, not in the traditional manner of public funding of fundamental research and teaching but by encouraging direct cooperation with business to solve technical problems or develop a new technology for commercialisation. 'High tech' firms are another specific target. Our review also identified some key characteristics of each program including eligibility criteria, firm size, specific industry sector and the region for the programs. This information and other program characteristics are given in Appendix C.

Range of services provided

The 5 main objectives of business advisory programs fall into the following categories: business assistance and advice; incubator programs; commercialisation; export assistance; encouragement of collaboration

Service funding

Detailed data on funding of these business advisory programs is limited. Based on the information available, we identified that 62 per cent of the programs offer grants to businesses. None of the programs offering a comprehensive suite of support measures has a detailed breakdown of funding on individual elements offered. Moreover, there are large differences in the scale of funding and the scope of activity across the programs, a number of which provided both advice and grants or loans as an integral part of the service. Some programs offer equity finance or venture capital.

How do firms get to participate?

All the programs examined for this report are selective in one form or another. Some impose eligibility criteria, such as firm size, regional location or industry. Grant-based schemes can require 'matched funding' from firms. Others are 'merit based' where program administrators select the 'best' applications, which typically entails a firm having to make a case detailing its plans for how it will use the program assistance and the anticipated benefits. (These are detailed in Appendix A).

National differences

Most nations offer a variety of business advisory programs, but it was also found that across nations greater emphasis is given to certain objectives or types of business activity than to others.

Evaluations of government-supported business advisory services

Purpose of evaluations

All evaluations had the explicit objective of assessing program outcomes against program purpose with a view to improving current program design and performance.

A typology of evaluation methods

Five distinct evaluation methods using qualitative and quantitative studies were employed:

(i) difference in performance of treated groups pre- and post-treatment

(ii) difference of performance of treated and untreated control groups

(iii) randomised control trials (RCT)

(iv) qualitative assessment of the programs

(v) descriptive assessments.

The first and second method can be designed and delivered ex post that is, during or after delivery of the program, and therefore do not control for possible confounding influences on firm performance. Specifically, the first method examines the difference in performance of treated groups pre- and post-treatment. The second method employs comparisons of treated and untreated groups using either solely quantitative methods or some combination of quantitative and qualitative assessment. The third method, RCT involves the recruitment of many participants, not all of whom will receive treatment, but the non-treated group remains essential to the validity of the results since evaluation relies on comparing treated and untreated groups. Importantly, because RCTs must be designed before the program begins, RCTs necessitate program delivery being integrated with evaluation from the beginning of the process. The fourth entails judgements made by program evaluators based on a variety of qualitative data, such as interviews with

participants and program managers. These focus on the administrative ease and efficiency of the program. The final method simply describes the program without making any judgement about program performance. Strictly speaking this last approach is not an 'evaluation method' but, since the majority of reports used were of this nature, it is included for convenience and serves the important role of differentiating this type of study from the other four evaluation methods. All evaluations of government-supported business advisory services employed just one method for assessing program outcomes.

Limitations of evaluation methods and recommendations to improve program evaluation methods

A detailed account is provided of the limitations and advantages of each method with examples drawn from the evaluations. RCT is the 'gold standard', but it too has limitations such as the difficulty of applying it to large-scale programs. The most common method is qualitative assessments of pre- and post-intervention.

Main findings about program design, performance and recommendations

Variety of programs offered around the world

- Across all nations there is a strong similarity in the broad type of services offered to achieve the 5 objectives listed above. This either reflects the fact that nations arrive at common solutions to address the same market failure and/or there is some degree of copying. Aside from activities explicitly and solely targeting entrepreneurship, start-ups and exports, business advisory programs across all nations are overwhelmingly directed at innovation, productivity and efficiency. This takes 2 forms: lifting the average level of innovation/productivity amongst firms or targeting 'high tech' firms and innovations.
- Several programs, as part of their suite of offerings to business, provide direct financial support to assist firms implement the advice.

Evaluation methods

- Aside from the RCT evaluations, there were few examples where evaluation was built into programs design from the beginning. This had adverse effects on the quality of the evaluation, such as the use of controls derived from 'data bases of convenience', difficulty sourcing appropriate evaluation data from participants or low response rates from participants.
- There are limitations to all evaluation methods but RCTs should address most of the major confounding factors, such as unobserved differences between participants and control groups, and biased participant responses that reduce the validity and reliability of evaluation findings.
- A major issue that can undermine all evaluations, including RCT, is allowing insufficient time between program commencement and evaluation for intended program effects and unintended consequences to appear in participants. Cognisance of this issue should be uppermost in the mind of program managers.

High-performing programs

- Successes and failures were found across different program objectives and types of advisory services. Their causes were often program specific.
- Unfortunately, due to limitations in the publicly available data it was not possible to identify the specific characteristics of program design, activities delivered and persons/agencies

delivering the programs that contribute to program success or failure as judged by the evaluators. This is in part a function of the narrow purpose of most evaluations, which is simply to assess whether a program is achieving its objectives, not to delve into the detailed mechanisms of the program's operation that account for success or failure. This lack of detailed description and analysis is a major problem for those seeking to replicate an entire program or parts thereof, or to learn lessons from the activity. Despite this, some features of high-performing programs were identified in the evaluations or can be inferred from them. These entailed a combination of well-targeted initiatives that address the real needs of firms and highly competent service delivery, resulting in well-performing programs, for example:

  - those directed at innovation, productivity and efficiency especially the US Manufacturing Extension Partnership (MEP) Programme and the UK Manufacturing Advisory Service (MAS) program and the UK Catapult program
  - programs intended to improve inter-firm collaboration and/or collaboration between firms and public research institutions like the German Fraunhofer, Israeli Magnet Consortium and Swedish Competence Centres
  - programs offering some form of financial assistance as an integral part of the advisory service to assist in implementing the business advice. A particularly innovative example, which was also subject to a RCT, was the UK 'Nationwide innovation voucher scheme'. Also impressive were examples of start-up programs, such as those in South Korea, which provide comprehensive 'wrap around' services or a range of sequential and integrated services tailored to the evolving stage of development of a firm. These services range from initial encouragement of entrepreneurship among students, to initial firm conception such as practical assistance with business licensing, to profitable expansion and all the way to export assistance.

- For very large and highly complex programs, such as those involving multiple universities, public research institutes and many firms, this study concludes that success was achieved when governance and the system of incentives for all participants formed a self-supporting eco-system. This prevents participants 'free riding' or excessively pursuing their own interests at the expense of others in the 'ecosystem'. An example is the German Fraunhofer program, which has operated since 1948.
- A feature of many successful programs, aside from Fraunhofer, such as the Israeli Magnet Consortium, Swedish Competence Centres and US MEP Programme, is that they receive long-term bipartisan political support, which permits incremental design improvements and resolution of unintended consequences and unforeseen impediments.

Low-performing programs

- There are few publicly available examples of program failures or programs that do not meet their objectives. One example we did find involved insufficient monitoring of grants to participants to ensure program funds resulted in expected expenditure (for instance on research and development (R&D) and equipment), as opposed to just substituting for spending the firm would have made anyway.

Program Learning

- Some evaluations note it is important to have systems that capture on-going lessons learnt by both program delivery agencies and program participants, and mechanisms for the diffusion of these lessons to all service providers and participants. For example, the US State Trade Expansion Programme (STEP) exports evaluation recommended that 'SBA managers should communicate with grantees the identified best practices to assess how they could be implemented at the state level' (2M Research 2021).

Recommendations

- It is essential that an evaluation strategy be built into program design from the beginning for the purpose of regularly monitoring program performance, implementing incremental improvements and identifying data needed for evaluation.
- The RCT evaluation model offers the best way to make a rigorous assessment of design and performance. This model is best suited to pilot or trial programs given the difficulties of using RCT in larger scale programs. One of these difficulties is maintaining the interest of those firms who are not randomly selected to participate in the program in providing data for evaluation.
- Systems and processes should be implemented that are able both to capture on-going lessons learnt by both program delivery agencies and program participants, and to diffuse lessons learnt to all service providers, participants and other stakeholders.
- Further research should be conducted into better understanding the detailed design and operational features of global high-performing business advisory service programs, as this is generally lacking in published data and is a major impediment to diffusing good practice. In the first instance this could be remedied by elementary measures, such as contacting program administrators to access unpublished studies, evaluations and any documentation. The type of information that would be especially valuable to an agency seeking to replicate a program or learn lessons includes: initial identification of the need for the program; how firms are approached to participate; application forms; eligibility criteria used by program managers to assess entry; participant reporting requirements and the instruments used to collect data for program evaluation. This could be followed up with detailed questions to program managers.

A literature review of the impact of government-led business advisory services

1. Purpose of the review

This study provides a literature review of the impact of government-led business advisory services across 11 nations or country groupings by examining publicly available evaluations of those services. Business advisory services provide strategies to businesses to improve business capability. These strategies include advice to improve capability in management, financials, engineering production processes and more, with goals that may include innovation, productivity, exports, commercialisation, getting local firms into global value chains. Advisory services may also provide supporting grants.

The review collates and analyses published descriptions and evaluations of government business advisory services to identify: the rationales for different advisory services; target groups; breadth of services outcomes for business participants; and national differences in the purpose and scope of advisory programs. The review also provides a critical appraisal of the methods and data used in these studies and identifies research gaps. Comment on the technical merits of particular statistical techniques will be mostly limited to referencing those made in the evaluations themselves. The review was commissioned to inform policy decisions, program design, delivery and evaluation by the Australian Government.

An acknowledged limitation in undertaking such a study is the limited public availability of high-quality program evaluations. An especially acute problem is that all evaluations identified were government-funded business advisory programs and all evaluations were funded, if not undertaken, by government. This arguably leads to an inherent selection bias since it could be in the self-interest of sponsoring entities to fund evaluations of programs they believe are reasonably efficient and effective. Conversely, unfavourable evaluations are less likely to be selected to appear on the public record. Finally, since some evaluations can appear in peer-reviewed academic journals, it is worth noting that many studies have found such publications have a bias towards publishing research that shows positive outcomes or findings that support the author's hypotheses (Duyx et al., 2017). These factors contribute to the fact that very few of the studies and evaluations included in this report were deemed by their authors to have not achieved their objectives. There is no obvious methodological remedy to these forms of selection bias. The implication is that this literature review can assist policy makers to identify the broad design parameters of 'successful' programs but is much less useful in identifying ways to ameliorate less successful or failed programs.

Additional limitations are that many of the studies examined and discussed here were not self-described as formal evaluations, rather they are descriptions of program objectives, methods and outcomes. They do, however, include the requisite data essential for this review, such as descriptions of program objectives, services offered and assessments of program outcomes and participant firm performance. A few studies that only partially addressed the requisite data items were included since they uniquely provided some insight into national programs, for example for South Africa.

1.1 Review research methods

In consultation with the Department of Industry, Science, Energy and Resources, it was decided to examine business advisory services in 11 nations or country groupings, including the United Kingdom (UK), United States (US), New Zealand, Germany, Israel, South Korea, Singapore, Japan, World Economic Forum (WEF), Organisation for Economic Co-operation and

Development (OECD), National Endowment for Science, Technology and the Arts (NESTA) and Scandinavian countries (several European Union and Scandinavian nations were treated as discrete single entities). Finally, two developing countries, Mexico and South Africa, were included, since they could illuminate different but still relevant facets of business advisory services. A list of countries/national groupings and the number of reports analysed for each is provided in Table 1. An average of 4 reports per country were analysed.

Potential reports were identified using online Boolean search terms such as '[country] and business and support or program or incentive or grant and review or evaluation or assessment or report'. Reports found were published by governments or international institutions, in academic journals and other databases, such as the UK NESTA (NESTA 2021).

Table 1: Number and country distribution of reports and evaluations

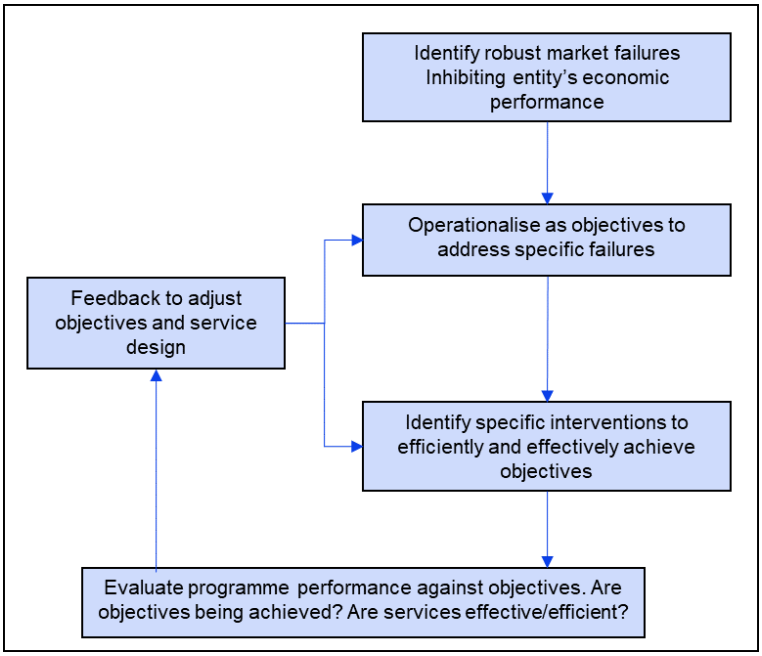
Applications	Number of Programs Identified	Number of Programs/Reports Analysed	Number of programs with evaluations
USA	6	5	5
UK	7	4	4
New Zealand	7	5	5
Singapore	6	4	4
Scandinavian	6	5	5
Germany	5	4	1
South Korea	6	4	0
Israel	17	4	0
Japan	4	4	1
OECD/NESTA/WEF	20	13	3
Mexico	1	1	1
Total	**85**	**53**	**29**

Criteria for inclusion in the study were that the programs and advisory services were government-initiated, and had an objective of improving management capabilities to stimulate growth, productivity, capability, export and innovation in the businesses. Covering both qualitative and quantitative studies, 5 distinct evaluation methods were identified. The first evaluation method compares performance of the entity pre-and post-treatment; second is a comparison of 'treatment' and 'non-treatment control groups'; the third method are RCTs; the fourth involves qualitative assessment of the programs; and fifth is purely a descriptive assessment.

2. A typology of government-supported business advisory services

From the review of the literature, we can construct an idealised version of the process of initiating business advisory service programs and the feed-back loop from implementation to evaluation and then back to design and implementation (Figure 1).

Figure 1: Idealised logic of business advisory service design, implementation and evaluation



2.1 Rationale for government-supported business advisory services

The conventional economic justification for all government business advisory services is that they address some form of 'market failure' or deficiency in the operation of markets, which unnecessarily inhibits the growth and development of firms, organisations or regions. The concept of 'market failure', especially as it relates to innovation and SMEs, includes the high cost for SMEs accessing and processing information regarding market opportunities and technologies; the difficulty identifying high-quality and unbiased information; the risk of firms investing in workforce skills when labour is mobile; risk-aversion in capital markets to novel ideas; and the sunk and irreversible costs of innovation investments (Nelson 2009).

Despite the importance the economic literature places on this justification, the business advisory programs we studied gave only cursory consideration to these matters. Nevertheless, a range of impediments to the initiation or growth of firms was identified in the literature including in markets that supply inputs to the firm, such as skilled labour markets, or venture capital markets, or markets that supply information to improve technology transfer, management practices, product/service design or firm efficiency. Second, these failures occur in markets which the firm seeks to enter such as export markets or shifting the firm's output into higher technology, higher margin products and services, or even failures in commencing a business like those addressed by business incubators.

In most cases these failures were briefly nominated as a rationale for the program or were implicit in the program's objectives. The term 'market failure' and the causes and implications of such failure were never or rarely mentioned. Instead the overwhelming focus in the documentation about the advisory programs was on the practical benefits to firms in participating in the program. In all cases the government business advisory services nominated a very wide range of public policy outcomes that would be achieved if specific market impediments were addressed. For example, the promotion of business and job growth, exports, technology diffusion and upgrading workforce skills, increased investment and assisting disadvantaged regions. In sum, the identification of market impediments to business growth, and the benefits attached to redressing

these failures through government-initiated action, constitute the main rationale for all government business advisory services examined here.

The US MEP Programme is representative of a service offering a brief but explicit 'market failure' rationale:

> The essential rationale for the MEP and similar technology and innovation advisory services in other countries is that existing small and mid-size establishments often face market imperfections and other systematic challenges in acquiring and deploying information, expertise, skills, and other resources. These issues lead to difficulties in technological and business upgrading, contributing in turn to lagging productivity, innovativeness, and competitiveness among many of these establishments (Lipscomb et al., 2017).

Similarly, the Singaporean Government's Capability Development Grant Scheme (CDGS) has the very broad purpose of 'supporting SMEs to overcome problems in implementing technology innovation and productivity improvement' (Chua et al., 2015).

Many programs, like the MEP Programme and CDGS, have quite a broad rationale, while others focus on a single market impediment. Three examples in this category are the US Small Business Technology Transfer (STTR) Programme and in Germany, the Fraunhofer-Gesellschaft (FG), both of which aim solely to lift collaboration between firms and public and private research institutions by removing significant barriers to firms, especially costs and management time for SMEs, accessing and co-operating with advanced scientific and engineering institutions[1]. By contrast the third example, the Greek 'Design Customised Support for Innovative SMEs Innovation Growth Lab (DCS-iSME) (2020) targets SMEs to improve their 'design thinking' in bringing new products and services to market.

The majority of programs analysed are directed at existing firms and aim to address a great variety of barriers to the performance of existing firms currently operating, employing workers and generating revenue. However, two other groups are also targeted, again, due to market-failure type rationales. The first are 'start-up firms'. This term is often not explicitly defined but can entail activities along the full spectrum from the encouragement of entrepreneurship to assistance with initial business formation all the way to firms that have a well-defined product or service they wish to bring to market, or have recently brought to market and are seeking assistance with continued expansion. Start-up firms face particular problems in raising capital, securing their intellectual property rights and entering new markets. They typically receive support because governments wish to promote business dynamics and they have potential for high growth.

The second group of programs target an unusual but quite distinct set of market failures; they are programs directed at 'social entrepreneurship'. This term refers to the promotion of entrepreneurship skills among disadvantaged groups and/or regions for the purpose of encouraging business start-ups as a possible solution to disadvantage and/or to encourage leadership skills to advocate on behalf of these groups and regions to ensure a more equitable distribution of government social, education and infrastructure spending. Clearly, existing firms and start-ups operating in such regions and groups experience the same types of market failure as described earlier but these are compounded by others such as low educational attainment, high unemployment and high crime rates. One such recent example is the Training Program to

[1] The STTR and FG are world-famous programs that provide subsidised and fee-for-service access to leading public research institutions teams 'who work with partners from industry and government to turn novel ideas into innovative technologies' (Intarakumnerd & Goto, 2018)

Encourage Social Entrepreneurship operating in France as described by Åstebro and Hoos (2021).

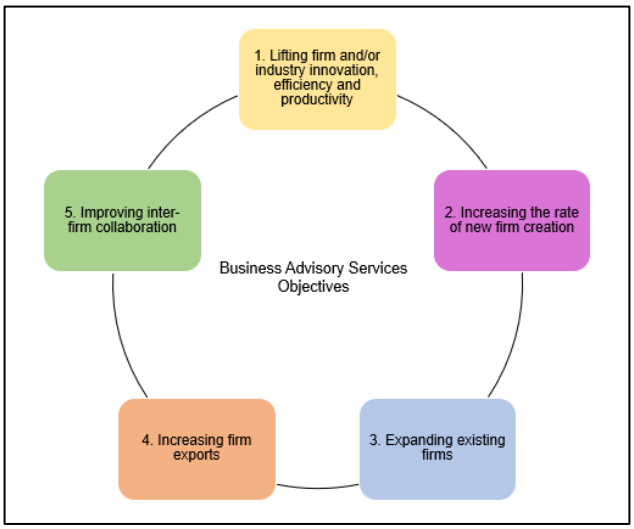
One notable variation is the Japanese Organisation for Small & Medium Enterprises and Regional Innovation. Its programs for small business are justified on the basis of rapid demographic change in Japan. Specially, 'Japan's unprecedented rate of declining birth-rate and aging population, it is inevitable that our domestic market will decrease in size and SMEs will need to explore business opportunities and capture new demands overseas' (Japanese Ministry of Economy, Trade and Industry 2021).

The more general argument for government assistance in the economic literature is that positive economic externalities from improved business performance would not occur without a government intervention and that the economic value of the externality can be significant and possibly exceed the direct cost to taxpayers. This externality argument underpins the long-established R&D tax concessions provided by the Australian Government, which are argued to generate large 'technological spill-overs' from participating to non-participating firms (Productivity Commission, 2007). However, in all the cases in this study the wider social or economic benefits are left implicit. This absence is worth noting since assistance by government to industry is typically justified not only because it helps an individual firm improve its own market access or profitability, but because such assistance provides wider economic benefits such as demand for goods and services or direct employment or externalities to other firms, organisations or regions.

2.2 Program objectives

As noted earlier, the great majority of programs have multiple, or even diffuse, objectives, reflecting first the variety of market failures that constitute the rationale for business assistance programs. Unsurprisingly, all programs, without exception, are directed at supporting economic development but these can be further classified into several categories. These categories are not necessarily mutually exclusive. Figure 2 depicts the 5 objectives of the programs.

Figure 2: Business Advisory Services Objectives



Most programs specifically target firm and/or industry innovation, efficiency and productivity. A smaller number mention specific regions where programs apply. Typical of these is the UK Catapult Network (Department for Business, Energy & Industrial Strategy, 2021) whose primary objective is to 'enhance business access to leading-edge technology and expertise'. The US MEP Programme, run by the National Institute of Standards and Technology (NIST) provides a

comprehensive range of services 'leading to improved business performance outcomes such as enhanced productivity, sustainability, and growth for its clients' (Lipscomb et al., 2017).

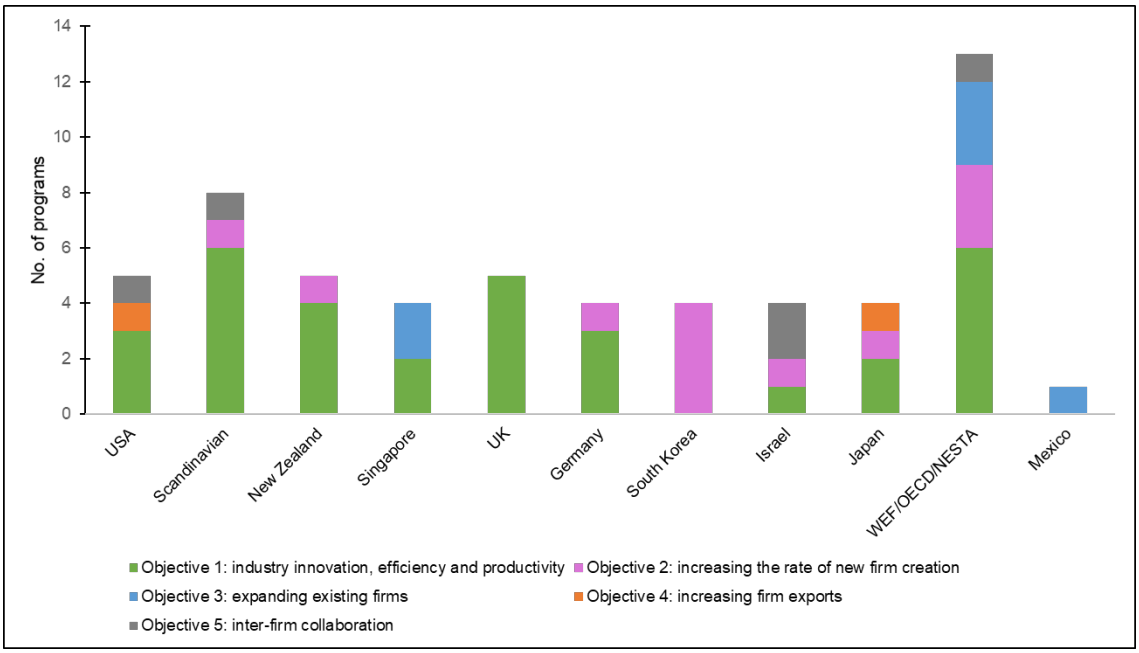
Next in frequency in the majority of nations are programs with a specific objective of increasing the rate of new firm creation, notably through assistance to start-ups and of encouraging entrepreneurship. Representative is the InnoFounder program run as part of wider Innovation Fund Denmark, which provides 'a one-year incubator course offered to new graduates with innovative and scalable business ideas' (Irisk Group, 2018). In New Zealand, the NZ Trade and Enterprise (NZTE) Incubator Support Programme had the purpose of 'stimulating entrepreneurship, innovation and business growth [by]…developing and supporting business incubators in New Zealand' (Ministry of Business, Innovation and Employment 2012). In South Korea, the objective of the Korea Institute of Start-up and Entrepreneurship Development (KISED) is 'to contribute to the development of the national economy through the growth of start-up businesses and job opportunities and promote the technology-based start-ups of future entrepreneurs by cultivating entrepreneurial spirit' (KISED, 2021).

Third is the objective of expanding existing firms. To a great extent, this overlaps with the innovation and efficiency objective, the difference being that business expansion is an explicit objective of several programs, whereas in the first objective, innovation is clearly targeted as an end in itself, without overt focus on its potential effects. For example, the UK Scale-up Programme provides 'one-to-one, bespoke and funded support centred around innovative scale-ups [meeting]…specific needs for scaling a business for growth' (Innovative UK EDGE UK, 2020). The New Zealand Growth Services Fund has the objective of 'accelerating development of firms with high growth potential and enhance[ing] their contribution to New Zealand's overall economic growth' (Ministry of Economic Development, 2009). The Norwegian Innovation Clusters Program is specifically directed at growth by supporting inter-firm collaboration (Technopolis Group, 2017).

Fourth are programs that specifically target increasing firm exports. The Korean Start-up Voucher Program run by the Korea Trade-Investment Promotion Agency & Korea International Trade Association in association with the Ministry of SMEs and Start-ups has the objective 'to remove barriers between government departments' export support projects and to allow small and medium-sized enterprises to freely select export support projects that fit their export capabilities'. Similarly, as noted earlier, in Japan's Ministry of Economy, Trade and Industry (METI), the Organization for Small & Medium Enterprises and Regional Innovation, has the objective to 'empower SMEs that drive Japan's economy…to increase the number of SMEs tapping into overseas markets'. The US STEP specifically targets an expansion in exports from US states, either in inter-state trade or international exports (2M Research, 2021).

Finally, a few programs targeted inter-firm collaboration as a means of promoting diffusion of technical and market intelligence. An example is the Israeli Government's MAGNET program run by the Consortiums Innovation Authority (Technology Infrastructure Division) whose objective is inter alia to 'to provide grants for R&D collaboration as part of a consortium (a group of industrial companies and research institutions developing technologies together)…[I]t allows distribution of knowledge and cooperation between companies operating in the same field, which may be difficult to achieve otherwise'. The distribution of analysed programs based on the 5 objectives is shown below (Figure 3).

Figure 3: Distribution of analysed programs based on 5 objectives



As noted above, it is quite uncommon for the advisory services to identify specific external benefits to non-participating firms, organisations or regions, such as identifying the spread of specific technologies from participating to non-participating firms or easier access to export markets or benefitting from the growth of a skilled regional labour pool due to growth of assisted firms. Specific external benefits are also absent from objectives aside from the most generalised statements regarding national development.

As we shall argue later, the common use of quite generalised objectives can cause problems in evaluating program performance since the link between the broad objectives and the specific metrics used to measure or evaluate outcomes may be indirect or only partially match the broad objectives. Further, it can be difficult to assign specific services (treatments or interventions) to particular objectives, making it difficult or impossible to determine the efficacy of specific services in meeting program objectives.

Much less commonly, some programs have tightly defined and readily measured objectives. The US STEP has the following readily quantifiable objectives: 'to increase the number of small businesses that are exporting; to increase the value of exports for small businesses that are currently exporting; and, to increase the number of US small businesses exploring significant new trade opportunities' (2M Research, 2021).

2.3 What firm demographics and industries/sectors receive assistance

A wide range of industries, sectors and activities are identified as having market failures and therefore are candidates for business advisory programs. (Appendix A and Appendix B contain lists of all programs by their intended target group.)

By far the most common group to whom government advisory services are specifically directed are SMEs.[2] The definition of what constitutes an SME varies across countries and frequently in

[2] Large established firms are not targeted for business advisory services, though they are eligible for other assistance, notably tax concessions for R&D and investment. Moreover, because large firms dominate certain industries, such as pharmaceuticals,

the evaluations is not defined.[3] All programs for SMEs are distinct from those for start-ups or focused on entrepreneurs. For example, the Zentrales Innovationsprogramm Mittelstand (ZIM) run by the German Federal Ministry for Economic Affairs and Energy (2021) is directed at Mittelstand enterprises (SMEs), defined under the program as 'companies with less than 500 employees and an annual turnover of less than €50m'. The Singaporean Isprint Scheme is directed at 'local SMEs…defined to have at least 30 per cent local shareholding, and not more than SGD$100 million in group annual sales turnover or not more than 200 employees under the group' (Poh & Shan, 2016). (At the time of writing 1 SGD$ is equivalent to 1 A$). The Japanese Organization for Small & Medium Enterprises and Regional Innovation, run by the Ministry of Economy, Trade and Industry (2021) targets 'SMEs…based on the capital and number of employee size: Manufacturing and Others: 300 million yen or less; Wholesale: 100 million yen or less; Retail: 50 million yen or less; Service: 50 million yen or less'. (1 JPY is equivalent to approximately 1.2 cents A$, so the program definition is equivalent to an SME with up to $3.6m in annual turnover).

The majority of programs are agnostic, or non-selective, about the specific industry or technology to be supported. However, where industries are specified in the evaluation, the most commonly targeted is manufacturing. The outstanding examples here are the US MEP Programme (Lipscomb et al., 2017), and the UK MAS (BIS Expert Peer Review for Evaluation, 2016). Although never stated in these evaluations, the rationale for this concentration on manufacturing is almost certainly that this industry is at the leading edge of technological development. Given that the predominant reason for providing the advisory services is to lift innovation, it follows that manufacturing sector has a preference over other sectors. The central role of manufacturing in innovation has a long history (Toner, 2000) and remains important, with manufacturing linked to services especially software, logistics, as well as having a critical role in creating green technologies to substitute both energy sources and new products and production processes to combat climate change (De Backer et al., 2015).

Especially prominent in receiving support are 'start-ups'. Two main types of start-up assistance can be identified. First are incubator-type programs that aim to stimulate the creation of new businesses, typically encouraging innovative and technically advanced products and services. For example, the Federal Ministry for Economic Affairs and Energy (2019) identified that despite 'the large number of university graduates, only a small number dare to make the transition into professional self-employment or start up their own companies. The level of technical qualification at universities and universities of applied sciences is excellent, however matters relating to entrepreneurship do not feature in curricula, and a culture of entrepreneurship is lacking in teaching, research and university management. Despite the increased number of innovative business start-ups appearing in the 1990s, the great potential for start-ups at universities is rarely exploited.' Accordingly, it established the EXIST program to support 'students, graduates and scientists from universities and research institutes who want to turn their business idea into a business plan. The start-up projects should be innovative technology or knowledge-based projects with significant unique features and good commercial prospects of success. KISED (2021) runs multiple programs to 'contribute to the development of the national economy through the growth of start-up businesses and job opportunities and promote the technology-based start-ups of future entrepreneurs by cultivating entrepreneurial spirit'. These provide a comprehensive

chemicals, aerospace, ICT, medical devices and advanced military hardware, that are targeted for specific government support large firms do participate extensively in government programs. These programs are different in many respects from the standard business advisory services examined here. For example, they typically promote technological breakthroughs (such as the vast government support for 'moon shot' breakthroughs like the pandemic MRNA vaccines) rather than the diffusion of existing technologies. In addition, the scale of government programs for large firms is typically is in muck larger magnitudes than that for standard business advisory services.

[3] The ABS (2001) defines a small business as employing less than 20 people, medium businesses employing 20 or more people, but less than 200 people; and large businesses employing 200 or more people.

‘range of services actively supporting technological innovative start-ups…based on the stage of the business including: Pre-start-up Package, Early-Stage Start-up Package, Start-up Scale-up Package, Second Chance Start-up Package, Tech Incubation Programme for Start-ups (TIPS), Service Voucher for Start-up, Corporate Venture program…[Commercialization] Partnership with Global Companies, 200 Baby Unicorns… [Overseas Expansion] Global Start-up Academy, Korea Start-up Centre (KSC), Global Acceleration Program for Start-ups (GAPS)’.

The second major type of start-up program is for firms that are on or just past the point of commercialisation of a product or service, and need assistance with further growth. (As can be seen in the previous KISED example, there is some overlap in these program typologies). A good example is the Korean Accelerator Investment-Driven Tech Incubator Program for Start-up (TIPS) jointly run by the private-sector Korea Business Angels Association and KISED. This program ‘is designed to identify and nurture the most promising start-ups with innovative ideas and ground-breaking technologies. In order to support them when entering the global marketplace, it appoints and designates successful venture founders – who are now angel investors and leaders of technological enterprises – as their incubators/accelerators. It then offers seamless services encompassing angel investor networking, incubating, mentoring/professional support and matching R&D funds’.

Universities and public research are also commonly supported, not in the traditional manner of public funding of fundamental research and teaching but for co-operating directly with business to solve technical problems or develop a new technology for commercialisation. The obvious example is the FG bodies in Germany, which are embedded within traditional universities and public research institutes and constitute ‘interdisciplinary research teams [who] work with partners from industry and government to turn novel ideas into innovative technologies, to coordinate and realize key research projects with a systematic relevance, and to strengthen the German and European economy’. As Intarakumnerd & Goto go on to note ‘[i]nternational collaboration with outstanding research partners and companies from around the world brings Fraunhofer into direct contact with the key regions that drive scientific progress and economic development’ (2018). Similar institutes exist in Sweden as the Swedish Competence Centres programme, jointly run by the Swedish Governmental Agency for Innovation Systems (Vinnova) and the Swedish Energy Agency (Stern et al., 2013). These Competence Centres operate within universities and involve a consortium of companies working together with people from more than one academic department in doing R&D. Aside from undertaking research and post-graduate training their role is to ‘encourage the development of interdisciplinary critical mass within academia in areas of industrial relevance…Changing research culture [to become more industry focused] and producing innovations in the participating companies.’

We identified just a few outlier programs, with only one of each type targeting specific groups. The European Union (EU) funds the Diversity Innovation Support Scheme (DINNOS) for SMEs. It aims at ‘preventing and reversing the adverse impact of age diversity on innovation’ by delivering ‘cognitive training for older employees as well as leadership training for entrepreneurs… to reduce age stereotypes and associated conflicts and enhance appreciation of age diversity’ (Innovation Growth Lab 2019). The UK Research and Innovation (2020) funds an artificial intelligence (AI) program in London's hospitality and retail SME sector, ‘to trial the effectiveness of different forms of business support and how they affect the uptake of Artificial Intelligence technologies in London’s hospitality and retail SME sector. An example is the use of AI 'chatbots' and marketing automation systems.’

While several programs provide direct financial assistance to firms (to be discussed in the next section on services provided by advisory programs) only one program especially targeted the banking industry with a view to reducing the cost of financing of productivity investments. The Capacity Building Support Program run by the Mexican Rural Finance Development Agency

addresses the market failure of inadequate risk and information and communication technology (ICT) infrastructure in regional Mexican credit unions, the result of which is excessive risk premiums or higher interest rates being imposed on rural borrowers. The program provides 'grants to rural financial institutions for technical assistance, which is provided through a network of accredited specialists' (Bruhn et al., 2018).

Finally, the Federal Ministry for Economic Cooperation and Development in Germany funds a business support program as part of its aid effort. The program's purpose is 'to deliver effective solutions that offer people better prospects and sustainably improve their living conditions. We help companies and foundations in achieving the Sustainable Development Goals of the 2030 Agenda and realising their worldwide business potential in developing countries and emerging economies'.

Another characteristic of the business advisory programs is the region in which services are offered. Most of the programs analysed were offered nationwide, for example the STTR and Small Business Innovation Research (SBIR) programs in the US; Business Basics Programme in the UK; and the Korea Institute of Startup and Entrepreneurship Development (KISED) of South Korea. A few programs cater to a specific location such as the UK's HeadsUp! Program, which operates in four main areas: London, Birmingham, Oxfordshire and Lancashire, and the EU's DINNOS, which caters to the West Midlands Region of the UK and the Rhine-Ruhr Region of Germany; or the Capacity Building Support Programme offering services to only rural Mexico.

2.4 Range of services provided

Rather than simply furnishing a list of services offered by advisory programs a more useful approach is to align program services against the 5 main objectives at which these programs are directed (Table 2). The programs selected for this review are representative of their type in terms of the range of services provided.

One important feature of the services is how comprehensive some programs are in meeting the needs of firms.[4] Three examples are sufficient to demonstrate this. Within the innovation/productivity objective the US MEP Programme provides business assistance 'delivered at the establishment level; typically to existing (as opposed to start-up), small and midsize manufacturing establishments….its services are customized to their needs; equivalent private sector sources are either more expensive or not available, the MEP Programme's services are oriented to business outcomes (rather than to research), and it offers independent yet comprehensive access to a range of expertise'. The program expects a broad range of changes in the firms participating in the program. 'MEP Programme services should prompt intermediate business actions, including, but not limited to, equipment investment, enhanced plant layouts, employee training, process and quality improvements, cost reductions, and new products and marketing strategies, leading to improved business performance outcomes such as enhanced productivity, sustainability, and growth.'

Second, start-up programs can offer complete support ranging from encouragement and initial education of budding entrepreneurs to start-up formation, incubator support with technology and business development, product and service certification all the way through to the expansion phase. The Korean KISED Start-up and US EDA i6 Challenge Programme are excellent examples of this 'wrap-around' service model. The Japanese J-startup program offers all of these supports and, in addition, extensive assistance with promoting start-ups to export.

[4] It could be that more program would be deemed 'comprehensive' if further data was available. As indicated in the introduction, this study was limited to publicly available data. Many evaluations and/or program descriptions did not include much detail about the type of assistance or range of services.

Finally, some export programs are tightly targeted at established firms that are substantially ready to export but need additional export advice and financial help to initiate or expand their inter-state and overseas markets. The Japanese Organization for Small & Medium Enterprises and Regional Innovation and the US STEP programs provide complete suites of support measures to participating firms. Figure 4 demonstrates the key targets and the common services provided by the programs including some exemplary programs and their objectives.

Figure 4: Key targets and common services provided by the BAS programs

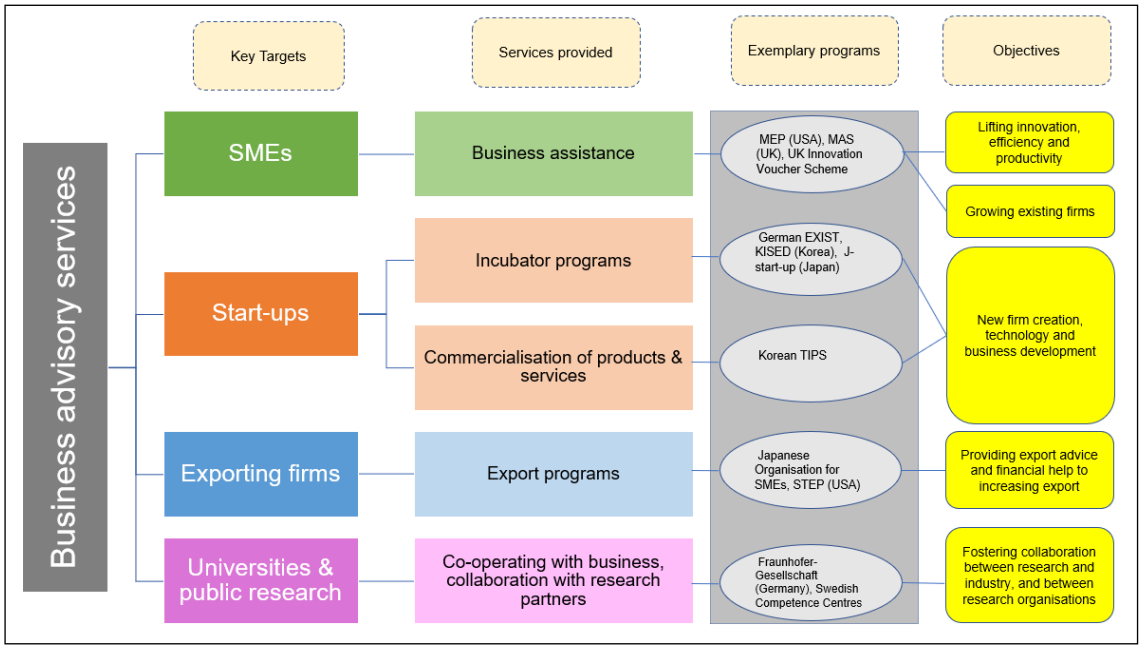


Table 2: Typologies of advisory service objectives and services

Objectives + program (Title/websites)	Services provided under program	Who delivers the service
Innovation, productivity, efficiency		
Sweden Swedish competence centres (Stern et al., 2013)	Swedish universities collaborate with firms to solve their scientific and engineering problems. This typically involves an inter-disciplinary team of academics to work on problems, often with post-grad students in co-operation with the firms.	Competence Centres are embedded within Swedish Universities
US STTR: An Assessment of the Small Business Technology Transfer Programme, (National Academies of Sciences, Engineering, and Medicine, 2016)	Stimulate small business innovation and commercialisation by providing access to leading public US science and technology research institutions to solve technical and engineering problems of selected small businesses. STTR is administered by leading science and engineering institutions in the US and these directly provide their expertise to small business.	These public institutions are the Department of Défense, National Institutes of Health, Department of Energy, National Science Foundation, and NASA.
US US Manufacturing Extension Partnership (MEP) programme (Lipscomb et al., 2017)	Services that directly provide expertise, diagnostics, mentoring, training, and other support to help manufacturing establishments to upgrade, as well as access and referrals to other public and private resources. MEP services are delivered through assessments of all aspects of a company's business or specific functional areas following a variety of outreach activities, one-on-one technical engagements to address a particular problem, hosting manufacturing networks for knowledge and current practice sharing, and training events depending on the needs and preferences of the manufacturer.	A network of manufacturing experts located in MEP centres deliver services with some mix of in-house specialists and third-party providers. More than 3,600 service providers are involved in service delivery.
Increase the rate of new firm creation-Start-up		
Korea KISED Start-up (KISED, 2021)	Comprehensive start-up supports younger than 3 years to stimulate expansion from start-up to commercialisation and sales. Provide funding to cover costs of commercialization activities, including prototyping production, intellectual property rights acquisition and marketing (Up to KRW 100 million). Specialized Programs 1) Minimum Viable Product Evaluation: Consumer feedback on products and services, market research, etc. 2) Growth Support: Marketing: production of promotional material; Certification: product, system certification, etc.; Finance/Accounting: bookkeeping, tax & accounting support, etc.; Intellectual Property Production: technical data lease & IP protection	Provides direct monetary support for a very broad range of activities, from accounting and marketing to export promotion as well as internal public sector educators and experts and external experts. Varies depending on the service provided
Sweden Regional Venture Capital Funds https://ec.europa.eu/regional_policy/sources/docgener/evaluation/library/sweden/1111_sweden_venture_eval_en.pdf"	Venture Capital investments go to SMEs that are in the seed, start-up or expansion stages. Venture capital funds address a gap in the supply of capital among SMEs with high growth potential and not compete with the private market.	VC funds are supplied by the public sector and a private commercial independent actor and the investment must be made on equal terms.

	The venture capital funds revolve i.e., that when the funds' holding is realised, the funds must be reinvested in the region. This also means that the funds shall strive to maintain their capital base.	
US EDA i6 Challenge Programme: Assessment & Metrics University of North Carolina, Chapel Hill SRI International, 2014) The EDA i6 Challenge Programme	Each of the six winning projects received $1 million in funding from the EDA that shows the greatest promise of increasing and accelerating technology commercialization (e.g., advance new technologies or new applications of existing technologies into the market place) All projects focused on accelerating the development and commercialization of innovative ideas, products, and services, utilizing a variety of methods, including creating networks, building collaborations, supporting research, providing early-stage funding, and generally addressing gaps in the commercialisation continuum.	The U.S. Patent & Trademark Office (USPTO)and National Institute of Standards & Technology's Manufacturing Extension Partnership (NIST MEP) Centres also offered technical assistance to winning projects.
Germany EXIST (Federal Ministry for Economic Affairs and Energy, 2019)	"The EXIST program comprises three schemes: Culture of Entrepreneurship supports universities in formulating and implementing a comprehensive and sustained university-wide strategy for increasing entrepreneurial culture and spirit. Business Start-up Grant supports students, graduates and scientists in preparing innovative technology and knowledge-based start-up projects. Transfer of Research funds both the resource development necessary to prove the technical feasibility of start-up ideas based on research and the preparation necessary to launch a business."	Public and private sector experts
Expanding existing firms		
UK The Scale-up Programme https://www.scaleupinstitute.org.uk/scaleup-review-2020/insight-innovating-for-recovery-innovate-uk-and-its-scaleup-programme/	Provides one-to-one, bespoke and funded support centred around innovative scaleups' specific needs for scaling a business for growth. Participants are assigned a Scale Up Director who works with them as their designated single point of contact, to identify key scale up challenges and enablers that the collective resources, skills and connectivity of the board can address. They help in access to funding and finance, internationalisation, infrastructure and internal operations, intellectual property (IP) and talent acquisition and retention.	Public and private sector experts.
Increasing firm exports		
Japan Organization for Small & Medium Enterprises and Regional Innovation, Ministry of Economy, Trade and Industry (METI) https://www.smrj.go.jp/english/ceo/	This program focuses on building relationships between Japanese SMEs and overseas companies through company visits, 1 on 1 business meetings, lectures and networking events. Overarching services provided: Consulting services, Dispatching experts, Talent Development, Information, funding, Supporting SME-related Organizations A wide range of services to help SMEs find solutions at every phase of their business cycles are provided: 1. Start-up phase (Incubation Facilities, Utilization of Regional Resources / Agri-Commerce-Industry Collaborations / New Partnerships) 2. Growth phase (Market expansion, Online Matching, Overseas Business Development) 3. Maturity Phase (Business succession, Business Turnaround, As the headquarters for Japan's SME turnaround measures, we provide various assistances to regional business turnaround support centres initiating the process for SMEs).	Public and private experts as well as co-operation between SMEs and larger firms.

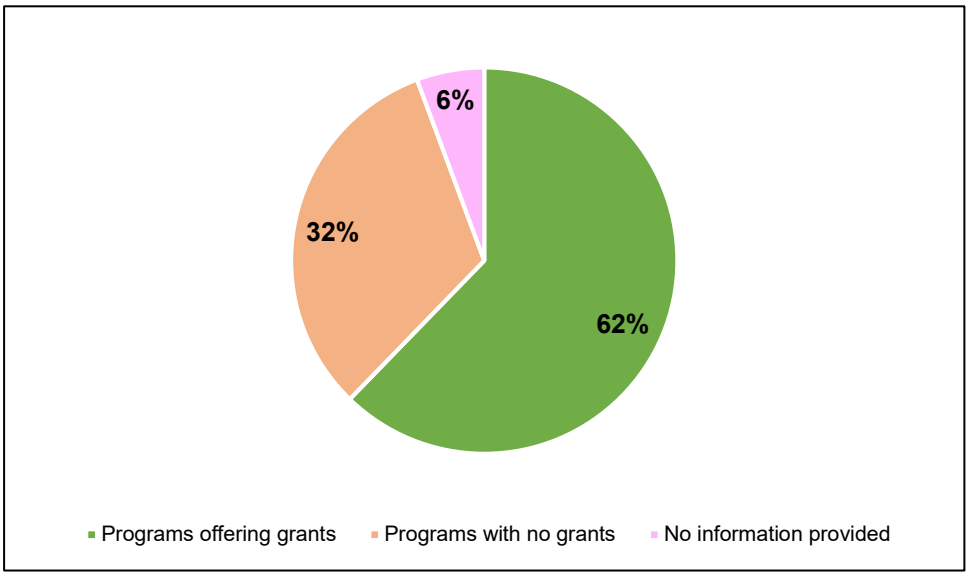
US US State Trade Expansion Programme (STEP) (2M Research, 2021)	Export Activities Allowable under STEP: 1: Foreign Trade Mission. Eligible small business travel, with more than one person traveling together with similar accommodations to the same location in a foreign country, that will enable them to explore or expand international business opportunities. 2: Reverse Trade Mission. Bringing buyers to the United States to meet with potential suppliers of U.S.-manufactured goods and services. 3: Commerce Subscription Service. Utilization of services available from the U.S. Commercial Service, the trade promotion arm of the U.S. Department of Commerce's International Trade Administration, to assist eligible small business with entering or expanding their markets. 4: Website Translation, SEO, Localization. This activity includes translation of websites into foreign languages, localization for foreign markets, and SEO for eligible small businesses. 5: International Marketing Media Design. Marketing media includes the following: brochures, social media platforms, websites, billboards, newspapers, branding and advertising, posters, and advertisements in international magazines. 6: Trade Show Exhibition. An exhibition for eligible small businesses to showcase and demonstrate their products and services. This exhibition includes both foreign and domestic trade shows. 7: Export Training Workshops. Workshops and courses that directly benefit and assist eligible small businesses in gaining credible knowledge of export policies, regulations, and/or best practices. 8: Export Consultancy Service. Only allowable after an eligible small business consults with the U.S. Department of Commerce to avoid duplication of services. 9: Other Export Initiative. Must be determined appropriate by SBA's Office of International Trade. Foreign market sales trips are an appropriate use of funds under this activity.	Public and private sector experts and contractors.
Increasing inter-firm collaboration		
Israel MAGNET Consortiums Innovation Authority (Technology Infrastructure division) Israel https://innovationisrael.org.il/en/program/magnet-consortiums	This incentive program supports the funding of high-tech research and production infrastructure, with links between firms and/or links between frames and public research institutions, it allows distribution of knowledge and cooperation between companies operating in the same field, which may be difficult to achieve otherwise.	High tech firms and public research institutions
Germany Central SME Innovation Programme (ZIM) https://www.zim.de/ZIM/Navigation/DE/Meta/Englisch/englisch.html	There are following options from which companies can choose the one that best suits their needs: ZIM cooperation projects - the program provides funding for R&D work carried out jointly by two or more companies, or by one company and one or more research institutes. ZIM individual projects - the program provides funding for individual companies doing their own in-house R&D work. ZIM cooperation networks - provides funding for external network management work carried out by innovative networks that comprise at least six SMEs which jointly develop a common innovation."	Universities and companies co-operate on common problems

2.5 Service funding

Data on funding is readily available from the public record but the detail is limited. Sometimes only a global figure per program is given. Where a program involves some form of financial grant or loan to participants an upper amount per participant is commonly given. In none of the programs offering a comprehensive suite of support measures was detailed breakdown of funding on individual elements offered. Despite this, enough information is provided to derive the following conclusions.

Based on the information available, we identified that 62 per cent of the programs evaluated offer a grant to businesses but the information regarding the amount offered to the participant is limited. The value of grants varies from program to program and country to country. Distribution of programs offering funding is provided in Figure 5.

Figure 5: Programs offering grants – Distribution of programs offering funding



The first observation is the enormous difference in scale of funding and scope of activity across the programs. Arguably the most expensive program was the German FG, which currently operates across 75 institutes and research institutions throughout Germany. The majority of the organisation's 29,000 employees are qualified scientists and engineers, who work with an annual research budget of € 2.8 billion. Not all of this is in the form of government grant; much is contract research that can be sourced from both public and private sectors. Similarly, the US MEP Programme operates across 50 states with more than 1,400 non-federal staff and over 2,400 third-party service providers involved in service delivery. Others can have more modest budgets amounting to 2-3 A$ millions per annum.

Second, a number of programs provide advisory services and also offer grants, loans, subsidised interest payments on loans and/or preferential access to government procurement contracts for successful participants. Most, if not all, programs offering finance are directed at the innovation/productivity/growth objective. Overwhelmingly, such financial assistance is used to implement the advice or strategy developed through participation in the program. For example, the Singapore IMDAs-iSPRINT service 'helps local SMEs defray the costs of automating their business functions through information technology' (Poh & Shah, 2016). Korean KISED, amongst other items, provides funds for start-ups to have their product or service certified to ensure

conformity with ISO or OH&S standards. The US STEP offers grants to firms to assist with costs entailed in increasing exports. The Danish Innovation Fund Denmark (IFD) has 4 sub-programs all of which have varying types of direct financial support to firms. The largest sub-program, called Grand Solutions, offers grants of between DKK5-30 million per project and makes 'substantial investments in long-term projects/partnerships between academics and businesses with the purpose of creating growth and solutions to societal challenges' (At the time of writing 1 DK Krone was worth 22 cents A$). The UK 'Nationwide innovation voucher scheme' is especially novel since vouchers to assist in paying for external consultants were offered to participants through a RCT (Kleine et al., 2020).

All programs offering loans or grants that were formally evaluated were deemed successful, aside from the Japanese SBIR, which could not show that program funding produced additional investment in innovation compared to what firms would have attracted anyway (Inoue & Yamaguchi, 2017).

The final common form of financial assistance is some type of equity finance. One type is where a government-funded program operates as a link between start-ups and private venture capital entities that assess the growth and risk/reward relationship of start-ups and decide whether to invest on a fully commercial basis. The Korean KISED programs operate on this basis. Alternatively, the public sector takes an equity position in a start-up or SME expansion. This is typically done through some form of venture capital entity, either wholly publicly owned or a public-private entity. The Swedish Venture Capital Fund is a good example of this. The investments go to SMEs that are in the seed, start-up or expansion stages. Venture capital addresses a gap in the supply of capital among SMEs with high growth potential (Ramböll, 2011).[5]

2.6 How do firms get to participate?

All the business advisory programs examined for this report are selective in one form or another. (Appendix C includes some data on program selection.) Selection can occur through multiple means. For example, it can involve a merit-based application process requiring prospective participants to fill out a form describing their needs, how the service may assist, and the outcome expected to arise from receipt of assistance. This is typically the case for established firms seeking assistance with innovation/productivity/growth projects, such as the UK Catapult or US MEP Programme. The assessment of these applications may involve site inspections by government employees or private contractors to assist with determining eligibility or appropriateness of the applicant.

Sometimes a formal competition is undertaken with a substantial 'prize' offered, such as funding for the firm to buy equipment and/or assistance in kind, for example access to university researchers and facilities. This is typically the case for larger grants or equity assistance for firms seeking to commercialise an innovation.

Thirdly, some services are non-selective, such as education programs for start-ups. After this initial engagement, however, continued participation, say in an incubator program, becomes selective, depending on the individual's performance over a period of time.

[5] A recent study by Bakhtiari (2021:59) of Australian federal and state government financial assistance to firms found that 'government assistance affects firms through increasing their propensity to seek financing and further by increasing their propensity to obtain the financing. The former is the larger effect. Besides, the largest additionality accrues to small and innovative firms. Magnitude of the effect also changes with the form and the number of assistance packages received from the government. The findings suggest that government financial assistance can have much broader impact than just supplying firms with direct cash.'

Finally, a few examples used a RCT to allocate participants to receive different types of treatment.

2.7 National differences

Given the sample identified for this report, it is clear that most nations offer a variety of business advisory programs, but it was also found that there is diversity across nations in terms of the emphasis given to certain objectives or types of business activity. It is difficult to establish a clear and unambiguous typology of national differences in business advisory programs, though some initial observations can be offered.

Korean assistance programs are heavily weighted to promoting start-ups. Germany and Scandinavian nations are oriented to encouraging commercialisation and entrepreneurship within universities and public research agencies and/or maximising collaboration between firms and university researchers. Israeli initiatives are much more focused on 'high-tech' sectors. By contrast, while both the UK and US are keen on promoting high-tech, they are also strongly focused on lifting the 'average' level of firm productivity, by diffusing new, but not necessarily, 'high-tech' methods to SMEs. New Zealand is notable for its emphasis on economic development of regions having low economic growth or low household incomes and with pockets of high deprivation and unemployment (Oakden et al., 2017).

For the majority of nations, the data on each program comprised a mixture of formal evaluations and/or a simple description of program ends and means, with or without additional data on outcomes.

3. Evaluations of government-supported business advisory services

3.1 Purpose of evaluations

All evaluations had the explicit objective of assessing program outcomes against program purpose with a view to improving current program design and performance. The selection of program metrics or measures of performance was chosen accordingly and in all cases the metrics were suitable measures to assess program performance. Often this was linked to the evaluation informing the design of future programs. A good example of this is the evaluation of the US EDA i6 Challenge Programme, which had one objective of providing 'new performance metrics and assessment methods that enhance the ability of all economic development practitioners and policymakers to design, implement, and evaluate programs in effective and rigorous ways… [and to create] a logic model to serve as a framework for future i6 programme assessments' (University of North Carolina 2014).

3.2 A typology of evaluation methods

Five distinct evaluation methods were employed, but with only one method used in each evaluation. These are (i) difference in performance of treated groups pre and post treatment; (ii) difference of performance of treated and untreated control groups; (iii) RCT, which can entail comparing difference in performance of randomly allocated treated groups against untreated groups or randomly allocated treated groups (where treatments are different); (iv) qualitative assessment of the programs; and (v) descriptive assessment. The distribution of programs based on the evaluation method is provided below (Figure 6).

Figure 6: Distribution of evaluated programs based on the 5 evaluation methods used

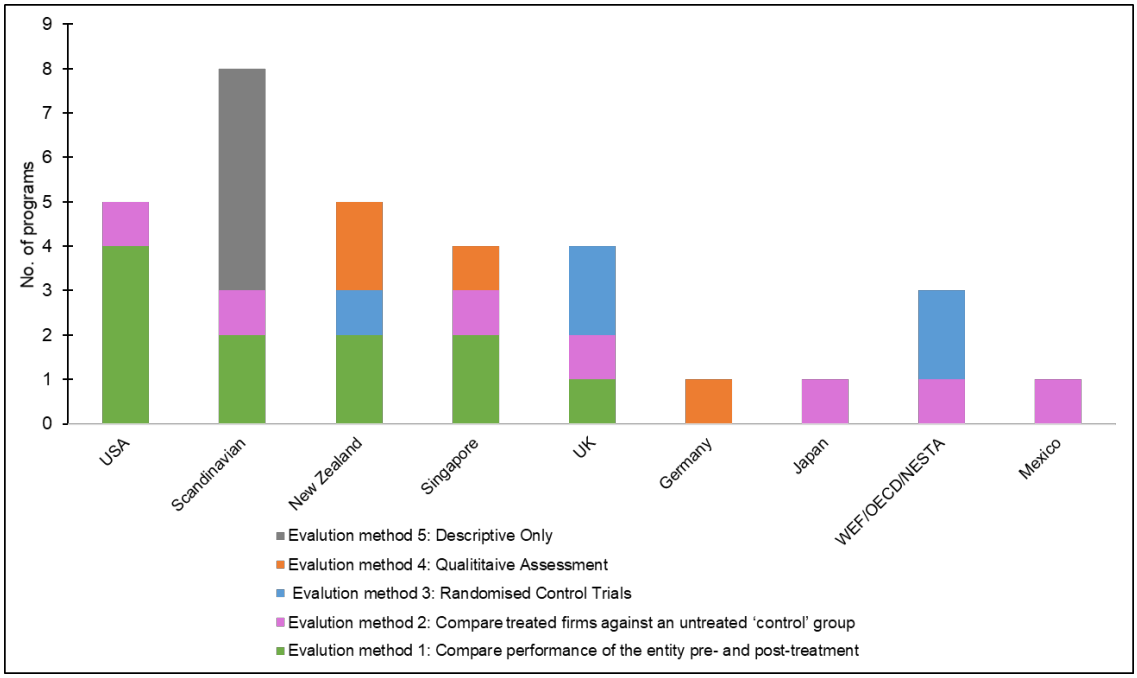
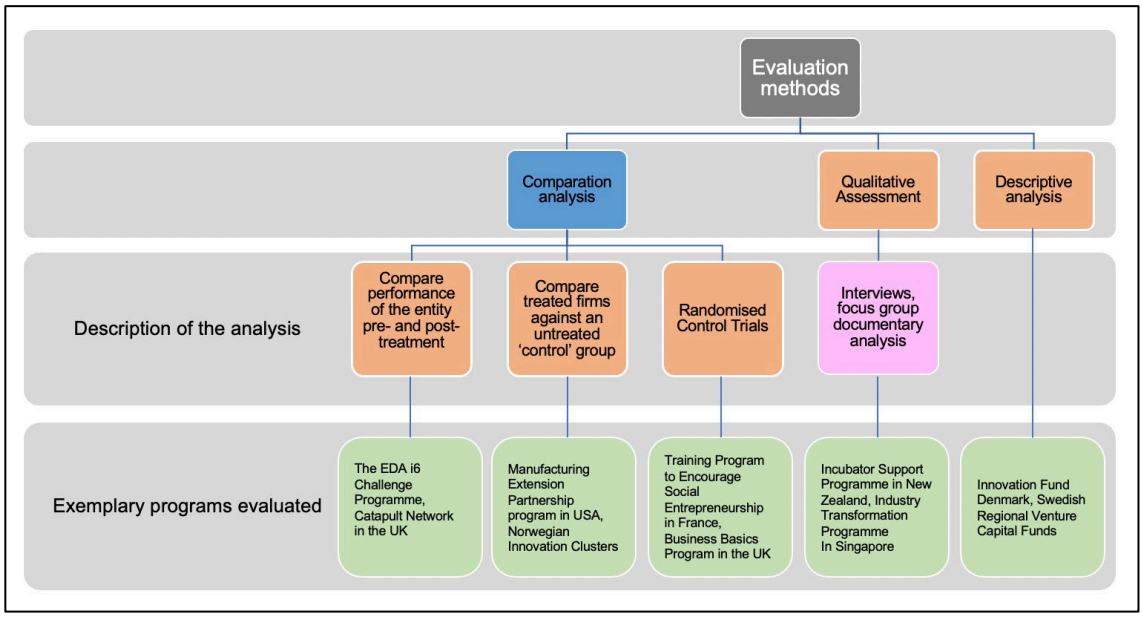


Figure 6 shows that most evaluations compared the pre- and post-performances of the entity. It should be noted that, while Scandinavian countries were the ones to publish most of their evaluation programs, the majority of these evaluated programs were descriptive in nature.

The choice of evaluation method appears to be a function of numerous factors, foremost the size of the budget available to researchers. Some studies were very small scale, with limited budgets, a very small sample size and employing solely qualitative methods. These typically use the first method, namely difference in performance of treated groups pre- and post-treatment. Other methods require a much larger scale of study and are much more expensive and time consuming. These studies usually have a large sample size and employ comparisons of treated and untreated groups using either solely quantitative methods or some combination of quantitative and qualitative assessment. The third method, RCTs, can involve the recruitment of many participants, not all of whom will receive treatment, but the non-treated group remains essential to the validity of the results since evaluation relies on comparing treated and untreated groups. Compared to all other approaches, RCT necessitates program delivery be integrated with evaluation from the beginning of the process because RCT must be designed and delivered ex ante (before and during program delivery) unlike the other two methods which can be designed and delivered ex post (during or, after delivery of the program). The typology of evaluation methods is depicted in Figure 7.

Figure 7: Typology of evaluation methods for business advisory services program evaluation



Compare performance of the entity pre- and post-treatment

The method of comparing the performance of an entity pre and post treatment is the most basic of all three methods. This is because it does not control for possible confounding influences on firm performance, such as entry of more competitors or trends in the business cycle. (Firms can experience a rise or fall in metrics such as revenue or profit due solely to 'boom or bust' economic conditions unrelated to the treatment). There were very few examples of this basic method. A representative example is the study of the UK Local Productivity Club (Palmer et al., 2019). This was a free educational program open to manufacturing SMEs in regional England. Its purpose was over a 3-month period to educate participants in basic productivity measurement and improvement techniques with the expectation that peer pressure from fellow participants would stimulate improvements in firm performance. The evaluation consisted of a qualitative survey and a face-to-face interview with just 3 of the total of 4 firms who were Club members. The overall results were mostly disappointing in terms of the bottom line impact. 'The results of the survey and productivity assessment at the end of the club showed that overall understanding had increased, that companies felt they had progressed in terms of the benchmark survey, though productivity figures did not always demonstrate this'.

A more robust example of this method is the US STEP program. It employed quantitative and qualitative methods to answer the following research questions: '(1) Are STEP grantees increasing the value of small business exports, reaching new clients, and producing new exporters? (2) Which STEP activities contribute most to client outcomes (e.g., increase in new-to-exporting ESBCs and increase in the value of export sales)? (3) What are best practices for STEP grantees that improve client outcomes? A random sample of participants was constructed with data drawn from quantitative interviews and data from firms on pre- and post-treatment export performance.' Overall, the evaluation found the grant and education program was successful in lifting exports but also made numerous recommendations to improve the efficiency and effectiveness of the program.

Compare treated firms against an untreated 'control' group

With this method differences in 'outcomes' between treated and untreated groups are assessed against the purpose or objective of the service program such as export growth, revenue, productivity and employment growth. The majority of evaluations used this 'control' group method and are in most cases use only quantitative data and a variety of statistical tests to determine program effectiveness. Typically, data on treated firms is derived from either large-scale survey of participants and untreated data is derived from other sources such as national statistical offices or private-sector databases. Alternatively, where treated firms can be 'matched' or identified in official data collections – a technique permitted by the use of unit-record data – this data can be used to compare both treated and untreated firms.

An excellent example of this latter approach is the study by Lipscomb et al. (2017) of the US MEP Programme. Data on both firms that received treatment under MEP Programme and a control group was derived from the US Manufacturing Census, which collects a vast array of data on individual establishments every few years. These data are longitudinal, enabling measurement of the performance of treated and untreated firms over time. Because the Manufacturing Census data covers every manufacturing establishment in the US, the study managed to identify treated firms in the census data. The control group was 'matched' against the treated group on a large number of variables such as industry, location, firm age, revenue and employment size. It was also possible to derive productivity and other measures to compare performance of the treated and untreated groups. Because the MEP Programme is a very comprehensive program the study also separately identified the type of treatment firms received, so the evaluation could compare outcomes within the treated groups and between the treated and untreated using the type of treatment received. The metrics used to determine program effect were establishment productivity and sales per worker for the period 2002–2007; enhanced probability of survival; labour productivity: all of which can be derived from the Manufacturing Census.

To measure the effectiveness of treatment the Lipscomb study used a variety of statistical methods including ordinary least squares multiple regression with variables such as change in productivity, revenue and employment in untreated and treated firms as the dependent variables, and a large number of independent variables such as firm size, age, location as well as a dummy variable for treatment vs non-treatment. To examine the specific issue of firm survival, the study employed a sophisticated 'hazard survival function', which in simple terms reduces to a logit regression model (logit regression is used where categorical variables are the dependent variable).

The study also tried to overcome the two confounding problems of 'selection bias' or differences between entities who self-select to participate in a program and entities that do not, and unobserved differences between treated and untreated entities. They do this by using 'difference-in-difference' statistical methods (DiD) to identify the effect of treatment. DiD is an attempt within the social sciences to replicate the genuine scientific experimental model by overcoming selection bias and unobserved heterogeneity across samples.[6]

[6] The World Bank explains DiD clearly. 'Difference-in-differences [DiD] is an analytical approach that facilitates causal inference even when randomization is not possible. …we cannot draw causal conclusions by observing simple before-and-after changes in outcomes, as factors other than the treatment may influence the outcome over time; further, we cannot simply compare enrolled and unenrolled groups due to selection bias and differences in unobservable characteristics between the groups. [DiD] combines these two methods to compare the before-and-after changes in outcomes for treatment and control groups and estimate the overall impact of the program. [DiD] takes the before-after difference in treatment group's outcomes. This is the first difference. In comparing the same group to itself, the first difference controls for factors that are constant over time in that group. Then, to capture time-varying factors, [DiD] takes the before-after difference in the control group, which was exposed to the same set of environmental conditions as the treatment group. This is the second difference. Finally, [DiD] "cleans" all time-varying factors from the first difference by subtracting the second difference from it. This leaves us with the impact estimation – or the difference-in-differences' (World Bank, 2021).

Randomised control trials

RCT in the social sciences is modelled on medical research, especially that commonly used in pharmaceutical treatments. (In medical research the fundamental problem is controlling for the placebo effect: when an improvement of symptoms is observed, despite using a nonactive treatment.) In the social sciences the main problem is, as explained earlier, self-selection bias and 'unobserved differences' between treated and untreated groups. The former problem arises primarily because participation in a business improvement program requires firms to self-select. Firms that self-select to participate in a business improvement program can differ in several important respects from entities that do not elect to participate. For the former these differences can include: higher expectations of performance of the business they own or manage; being more self-critical of their own abilities; having a keenness and preparedness to learn from others; and being associated with an openness to new ideas and ways of seeing and doing things that non-treatment firms may lack.

There are a number of RCT-based business advisory program evaluations in our sample. The following illustrates two main uses of RCT: first, random allocation of participants after they had self-selected to enter a program; and, second, random allocation of participants to receive different treatments offered under a program.

An RCT evaluation entailing a comparison of randomised treated and untreated groups was conducted in France in 2014–15 with the objective of promoting 'social entrepreneurship training…not only in entrepreneurial skills but also social leadership skills and social entrepreneurial identity development' (Åstebro & Hoos, 2021). Applications were sought from young people in France to participate in the program and the method entailed a 'stratified random allocation of qualified applicants into treatment and control groups'. This randomised selection controlled for self-selection bias and non-observable differences. Those who received treatment, which involved training and coaching from experts, and those not receiving treatment were followed up 6 months later to determine any differences in outcomes. Despite these sophisticated approaches the study found the program 'had no detectable impact on either leadership skills or social entrepreneurial identity measures'. However, they do claim the study, using 'RCT-based impact measurement can be a way for researchers to use scientific methods for improving entrepreneurial training in a collaboration between academics and practice. More research using RCTs will help the field to better balance the use of different research methods and to use the powerful RCT-inherent design element that allows for replication'.

A second example of this approach is the nationwide innovation voucher scheme in the UK (Kleine et al, 2020), which aimed to provide established SMEs with advice and financial assistance 'to bring new products and services to market', by promoting collaboration with external knowledge providers, notably in the field of 'smart specification'. The main areas of focus of the program were energy, water and cyber security. Firms applied to participate. Those deemed eligible to progress were randomly allocated to receive treatment via a 'lottery'. Surveys of treated and untreated groups were conducted during the 2 years the program operated, with controls for key differences such as industry, firm and age and size. The key outcome variables were extent of 'external collaboration' with knowledge providers; 'the number of new products and services, and the number of new patents, design rights, and trademark applications, as well as the number of newly established internal processes'; and, the 'effect of the voucher on overall business outcomes captured by turnover, profit, and the number of employees'. The key findings were that '[t]he innovation voucher significantly increases the probability of having received any external innovation support in year 1 after the innovation voucher award. Significant positive

short-term innovation voucher effects for newly created or significantly improved products and services. Firms that applied for IP-related projects and were offered an innovation voucher, are estimated to have almost 4 times more patent applications in the first year than firms that applied to conduct an IP-related project but were not offered a voucher. In the short and medium term, the innovation voucher is estimated to increase the number of newly created or significantly improved internal processes.' The study also found that it was unclear whether the 'behavioural changes' towards innovation induced by the voucher would be sustained in the longer term. However, there are 'no treatment differences for any of the business outcome measures, i.e., the probability of having turnover, the probability of making a profit or for the number of employees' (Kleine 2020: 20).

Another example of an RCT differentiating the impact of separate treatments offered under the same business advisory program is provided by the South African Business Training Program. It used a 3-stage process involving, first, visits from researchers to 10,000 retail businesses in Cape Town with the businesses completing a survey regarding their business processes and performance. Second, businesses were ranked 'based on questions covering formal education levels, years in business operation, formal registration status, motivation, and commitment as well as several interviewer impression questions evaluated by the RA [research assistant]'. Third, businesses were selected to receive training in either finance or marketing or to receive no training or assistance. 'The study design comprises two treatment arms with 266 businesses randomly assigned to finance training and 270 businesses to marketing training. A third group of 316 businesses, the control arm, did not receive any training.' The study used these metrics: firm sales, costs, and profits to assess any change in performance over the 12-month period after the receipt of training.

According to the evaluator, the 'results show positive and statistically significant improvements in profits among those businesses whose entrepreneurs were randomly assigned to receive finance skills training or marketing skills training. Magnitudes of the effects measured 12 months after training are large with a 41% increase for the finance group (0.2 standard deviation improvement) and 61% for the marketing group (0.3 standard deviation improvement) compared with businesses that did not receive skills training.' Unsurprisingly, training affected firm strategies as 'businesses in the marketing training program are significantly more likely to adopt marketing practices related to market research, marketing tactics, and sales. Entrepreneurs in the marketing training group adopt a growth focus: they implement policies and practices related to increasing overall sales and hiring more employees.' By contrast the 'finance training group adopt an efficiency focus: they implement policies and practices linked to reducing costs and effectively managing finances' (Innovation for Poverty Action, 2020).

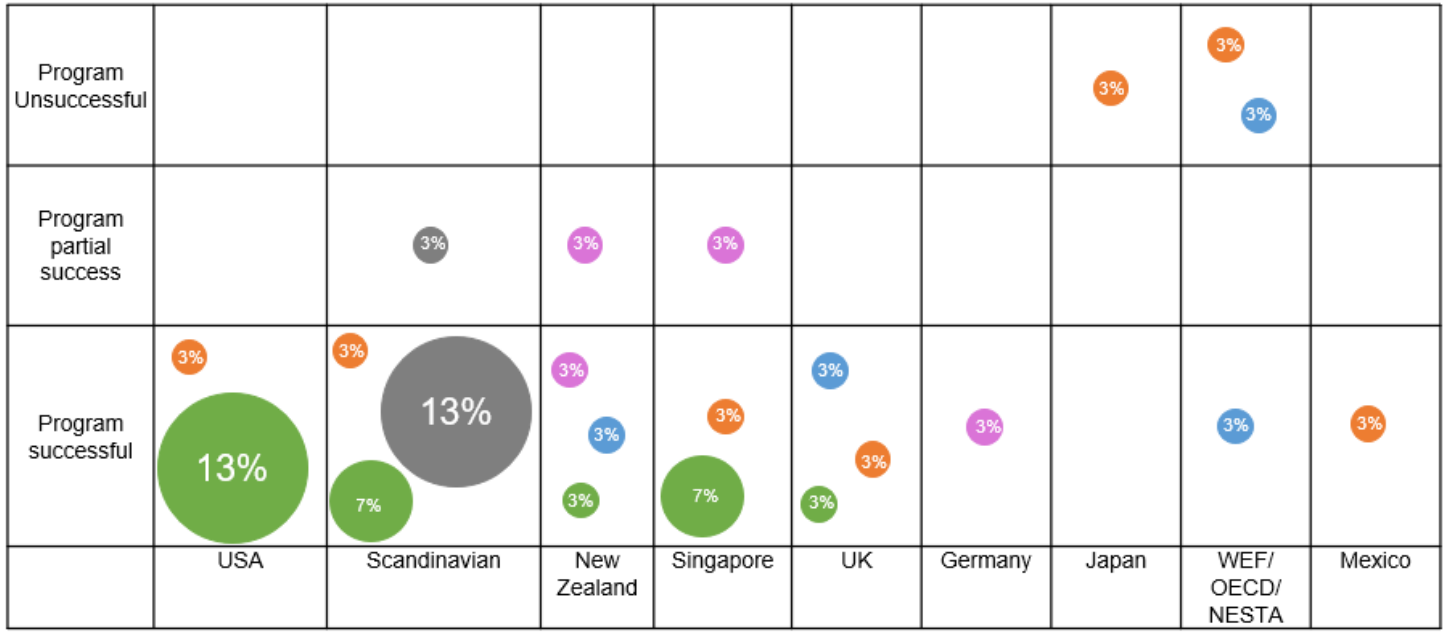
Other evaluation methods: qualitative assessment and descriptive Assessment

Several studies analysed used a simple qualitative assessment of program performance where the evaluator provided some very general assessment of success in terms of whether a program was achieving its goals. Such qualitative assessment used interviews to evaluate the administrative aspects of program and/or some general evaluation of outcomes derived mostly from interviews with participants. An example of this approach is the evaluation of the Regional Growth Programme (RGP) in New Zealand, which assessed the extent to which the implementation and processes of the program were working. The evaluation focused on the way the government agencies were interacting with each other and with regional stakeholders, for example, Māori in the regions. This was achieved by conducting qualitative interviews with government agency staff and regional stakeholders. Therefore, the evaluation outcome is largely representative of feedback from government agency personnel and regional stakeholders.

The last of the evaluation methods, the descriptive assessment method simply describes the program without making any judgement as to the program performance or suggesting a methodology for future evaluation of a program.

The overall distribution of analysed programs is provided in Figure 8 where the size of the bubble is the percentage of successful programs to total evaluated programs in the sample.

Figure 8: Overall distribution of evaluated programs



Note: The size of the bubble in the diagram is the rate of successful programs to total evaluated programs in the sample. For example: for US, it has 4 programs in method 1 that were successful; the study has 30 evaluated programs in total. Therefore, for US in evaluation method 1, it has 4/30=13%.

3.3 Limitations of evaluation methods and recommendations to improve program evaluation methods

The limitations of the evaluation methods reviewed have already arisen as an essential part of the previous discussion. For completeness, these and additional issues are briefly outlined below. The following discussion of methodological limitations is structured around the three broad formal evaluation methods identified above, but it is the case that these limitations may not be restricted to a single research method.

The first method compares performance of the same entity pre- and post-treatment. As noted above the biggest problem is the absence of a control group to assist in determining whether any intended change is due to 'treatment' and/or external factors that may independently account for any change in the entity's performance. There is also the problem of firms self-selecting to participate. Because of this quite severe limitation, it is common for evaluations using this method to employ only qualitative research methods or some combination of quantitative and qualitative methods. Qualitative data are essential to gain insights into many matters that cannot be readily collected via surveys and also permit a semi-structured format where a skilled interviewer can pursue unanticipated issues raised by a respondent or focus group. On the other hand, interviews do suffer from both self-selection bias and small sample size limiting the generalisability of findings.

The evaluation of the US STEP Programme that aimed at lifting SME exports employed this approach. This study highlights the problem of deficiencies by agencies delivering the program recording data about program participants, program expenditure per participant and outcomes. The evaluators note for example discrepancies such as missing or incorrect data and dates; STEP activities that were combined for reporting purposes; incomplete grantee numbers; funding dollar mismatch [between different agencies involved in the program] and missing client characteristics.

Deficiencies in the data held by program administrators arise for a number of reasons, in the STEP programme these were partly due to the program involving several levels of government. They can also arise when evaluations are undertaken post-initiation of a program – more or less as an after-thought – and not integrated into initial program design. In this circumstance data essential for an evaluation may not be available at all or are difficult to collect.

The US SBIR evaluation was similar to the STEP study in that it used quantitative and qualitative data, but it raised the additional problem of the program having multiple and somewhat diffuse objectives. This presented difficulties for the evaluators in determining whether all the objectives had been achieved. Nor was the study able to distinguish between important and relatively trivial innovations sponsored by the program. In other words, it could not assess what it referred to as the 'quality' of innovations. Finally, a fundamental problem with assessments of the importance of innovations is that the economic value or scientific importance of an innovation may not be apparent for some time after its introduction. This issue of the time allowed to elapse before commencing an evaluation is a fundamental and common problem. Typically, the timing is determined by funding and reporting cycles imposed by government on business advisory programs. In none of the studies were the same entities subject to long-term or repeated evaluations, say conducted at five- or ten-year intervals. (On the other hand, the longer the time allowed for effects to occur the more likely it is that entities will cease to exist, be taken over or radically change their objectives and operations, making comparisons implausible).

The control group method is intended to address the problem of self-selection and unobserved bias by 'matching' the characteristics of treated and untreated entities presumed to influence business performance. The object is to isolate the treatment effects from other variables that may influence an entity's performance over time.

The evaluation of the US MEP Programme was a particularly high-quality evaluation involving world-class researchers. Nevertheless, they noted several deficiencies with their own study that are widely applicable to other evaluations. First, an obvious problem is that typically the control group is constructed from public or private databases held by national statistical agencies or banks, and the control variables are limited to those collected. As described earlier, the MEP Programme evaluation it used the Manufacturing Census to not only construct a control group but also identify treated firms who had participated in the Census and collect data on the pre-treatment performance of treated firms. Unfortunately, the evaluation only 'achieved a 20 per cent allocation of firms that received MEP assistance to the…Census Bureau data on firms. As a result, some treated firms may erroneously be included in the control group, leading to a downward bias in the absolute value of estimates of the effectiveness of the MEP Programme' (Lipscomb et al., 2017). It was also unclear whether this matching was itself subject to some bias affecting the sampling validity.

Second, the MEP Programme evaluation also found that different statistical tests gave 'mixed results' or contradictory results, thereby precluding definitive findings. Third, 'limited time coverage', a problem noted earlier, meant that longer-term effects of treatments were not investigated. Fourth, 'an overemphasis on quantitative measures of productivity, sales, and employment numbers' used in the evaluation meant that it could 'not fully capture the effect of MEP in recessionary or slow economic growth periods'. For example, participation in the MEP Programme may have conferred 'survival' benefits on the firm, which can only be determined under adverse economic conditions for which the evaluation did not allow. Finally, like all control group studies the report tried to allow for selection bias and unobserved differences between treated and untreated groups. The control took the standard form of an instrumental variable model (IV) model using a variety of plausible characteristics that could influence the probability of a firm participating in the program (selection bias) and differences in the performance of firms over time (unobserved differences). They concluded 'we were unable to find a single instrument that controlled for selection bias across all of the years in the study'.

A well-resourced and logically structured RCT is generally regarded as the 'gold-standard' method in terms of controlling for selection bias and unobserved differences. For this reason, they are most very relevant to the question of how to assess the performance of business advisory programs. While several trials were included in this study almost all are still underway, with several not concluding for a few years hence.

RCTs are also subject to limitations. The most important is the cost of recruiting from the beginning two matched groups who will be randomly subject to a treatment. Second, is the problem of recruiting entities if they know from the beginning that they have a distinct probability of receiving no treatment. (This only applies to RCTs based on a treatment/no treatment model as opposed to all entities being randomly allocated to receive some form of treatment, with the object being to see which treatment has the largest effect). Moreover, it is much more difficult to maintain the participation of entities that receive no treatment over the life of the study (Åstebro & Hoos, 2021). Third, even RCTs are subject to some form of selection bias, since entities cannot be forced to participate in a study. Finally, another type of bias can affect RCTs, and indeed all methods, because programs rely on some form of application process with program administrators having to exercise discretion in selecting the participants who appear most 'deserving' or most likely to succeed, usually those who demonstrate a good plan to use the service effectively and who have clear objectives. This problem of 'program administrator bias'

arose in the UK MAS program since prospective participants first had to undertake a lengthy telephone interview with program administrators to determine their suitability to participate. Similarly, in the South African RCT study, program administrators identified some 10,000 potential SMEs for the program but selected only 1,500 to participate because they were deemed to be higher performing.

4. Main findings about program design, performance and recommendations

It is important to reiterate the three significant limitations of the present study. First, it is limited to publicly available data, and these may not reflect the breadth and type of business advisory service assistance offered or supported by governments around the world. Indeed, there are good reasons why this should be so. For example, governments may not want to publicise policy failures; confess to the existence of programs that may possibly infringe World Trade Organisation rules on government business assistance; or even have successful programs copied by competitor nations. Second, only around half of the published reports were formal evaluations that assessed whether a program achieved its objectives and amongst these not all had recommendations to improve program design. Third, within those with formal evaluations the soundness of their methods and data were of greatly varying quality, which restricts the robustness of inferences to the present study. Despite these limitations the following main findings can be drawn with some confidence.

4.1 Program Design

First, business advisory services are directed at 5 general objectives, though there can be some overlap between these. These objectives are to increase the following: the level of innovation, productivity and efficiency within firms; the rate of new firm creation, especially technology-based start-ups; the growth of existing firms; firm exports and inter-firm collaboration, especially related to technology and diffusion of best practice.

Second, the rationale for business advisory services in all cases either explicitly or implicitly, is some type of market failure, which was argued to be inhibiting the economic and/or social performance of an entity.

Third, these market failure constraints on the performance were in almost all cases held to apply with particular force to certain types of entities. Few business advisory services were in this sense ‘untargeted’. The exception being generic assistance, such as advice to potential foreign investors wanting to invest in Australia, regardless of any particular characteristics they may have. (These generic programs were generally not examined in this report). Almost, all business advisory programs are directed at SMEs; mostly but not exclusively manufacturing SMEs. The next commonly mentioned target are start-ups, and overwhelmingly start-ups in ICT activities. Also prominent are university and/or public research institutes with programs to encourage entrepreneurship, start-ups and commercialisation within these institutions and/or to form linkages with industry to solve scientific/engineering problems and develop new technologies. It was only in this last field of collaboration that larger firms were prominent as it is they which have higher R&D budgets and the managerial resources to engage in collaboration, often over several years.

Fourth, programs are delivered by either wholly public sector employees with deep expertise in science/engineering and/or business advisory or a mixture of public and private or wholly private.

Fifth, within each of the 5 objectives, unsurprisingly, there is a strong similarity in the broad type of services offered. This either reflects the fact that nations arrive at common solutions to address

the same identified market failure and/or there is some degree of copying across nations in services offered. Aside from activities explicitly and solely targeting entrepreneurship and start-ups and exports, business advisory programs across all nations are directed at innovation, productivity and efficiency. This takes two forms: lifting the average level of innovation/productivity amongst firms or targeting 'high tech' firms and innovations.

Sixth, it is worth highlighting the several examples of services which, as part of their suite of offering to business, provide direct financial support to assist firms implement the advice, for example to start-ups to pay for government licences and registration of patents. Programs for innovation, productivity efficiency objectives, offered grants and or loans to introduce ICT, AI and other equipment to implement business advice. Exports were encouraged by means such as grants to firms to participate in trade.

Seventh, the scale of business advisory programs differs enormously. The largest in our study was aimed at innovation, productivity and efficiency within firms such as the US MEP Programme or UK Catapult and collaboration between research institutes and industry, such as Fraunhofer.

Given the limited number of programs that include funding to business as an integral part of the program it is not possible to draw any strong conclusions about the nature and performance of these programs.

Finally, some national differences were identified in the scope of programs, and these were specified in this report, but such findings may not be especially robust given the limitations on the publicly available data or business advisory services.

4.2 Performance, observations and recommendations

Despite the limitations we have outlined, some observations can be drawn from evaluations of government-supported business advisory services examined in this study.

This study categorised five types of evaluation and identified the merits and demerits of each but regardless of the method to be employed **it is essential that an evaluation strategy be built into the program design from the outset**. This will assist in establishing clear, measurable and unambiguous objectives required to make the program accountable. It will also ensure relevant data is defined and efficiently collected from the beginning and increase the likelihood of participation in the evaluation of entities that received assistance. Ideally, some initial performance benchmarks for success will be established, but often this cannot be done rigorously until comparisons are made with a control group. Aside from the few RCT evaluations there were few examples where evaluation was built into program design from the beginning. This had adverse effects on the quality of the evaluation, such as the use of controls derived from 'data bases of convenience' or low response rates from participants.

The study identified a **spectrum of evaluations that deemed programs to be failures or successes**. The French RCT study of entrepreneurship was deemed a failure as 'no detectable treatment effect was found' and suggested more research was necessary to understand why (Åstebro & Hoos, 2021). Similarly, the large-scale Japanese SBIR concluded 'no significant positive relation was identified. The obtained results are not favourable because the SBIR awardees received grants but did not outperform other companies in regressions with various controls' (Inoue & Yamaguchi, 2017). The study formed a number of conclusions as to the cause of failure especially that grant R&D funds to firms displace R&D firms would have otherwise paid for internally. It suggested closer monitoring of firm's past and current spending could obviate the lack of 'additionality' from the program. Unfortunately, with a few exceptions it is not sensible to generalise their causes in part because successes and failures were found across different program objectives and types of advisory service and the causes were often program specific.

Many other quite positive findings were made of many programs and several stand-out as high performing and some as innovative. However, before detailing these it is essential to note a **major deficiency in these evaluations, at least from the perspective of a government entity wishing to 'learn lessons' from 'successful' programs**. This deficiency is that the evaluators, without exception, do not detail what particular design features of a program made it successful. This is understandable since attributing specific causes to overall successful programs, especially where there are many moving parts to a program, is fraught with potential misspecification errors. In addition, the terms of reference given to evaluators is limited in almost all cases to determining whether a program achieved its objectives efficiently and effectively, not to speculate on what alternative modes of delivery or other program design features could be worse or better.

The **identification of successful or innovative high-performing programs in this review is based mostly but not exclusively on those subject to formal evaluation**. This is not to say the evaluators did not make recommendations for program improvement, but generally the following were found to be successful in meeting program objectives. Several high-performing programs include those directed at innovation, productivity and efficiency especially the US MEP Programme (Lipscomb et al., 2017); the UK MAS (BIS Expert Peer Review for Evaluation, 2016) and UK Catapult Program (House of Lords 2021).

The use of RCTs for business advisory programs is certainly the most innovative approach to evaluation. Particularly innovative programs also offered some form of financial assistance as an integral part of the program to assist in funding implementation of business advice. The use of grants was also generally deemed to be successful by evaluators who, for example, recommended funding continue for the UK 'Nationwide innovation voucher scheme' (Kleine et al., 2020). It is important to note that in all cases these RCT programs were relatively small and regarded as 'pilots'. **It would appear that the main reason for undertaking these RCT programs is to subject ideas for industry assistance to the most rigorous form of assessment with a view to testing them out and, if found to be successful, possibly expanding the program in RCT form or expanding it without RCT but using some other type of evaluation.** (Following the medical RCT analogy, once an RCT has found a particular drug effective and safe the use of the drug no longer continues under an RCT regime but under conventional prescribing methods, though its performance is kept under supervision but the use of 'adverse effects' registers etc).

Although not an RCT program and also not subject to a formal evaluation, the Israeli Magnet Consortium program is worth highlighting as an innovative initiative. It directly funds collaboration between public research agencies and firms and, given the high cost to these institutions and firms in developing innovations to market, the program is quite generous in funding most firm costs and most of the research institutions' costs. Another notable feature is that both the level and purpose of funding is quite flexible depending on the need and prospects of the innovation being developed and brought to market. These features imply considerable discretion is granted to program administrators to approve large and flexible funding allocations and it can therefore be inferred that expectations of program success must be quite high, with a low tolerance for expensive failures.

Many programs of collaboration between universities/public research institute and firms were deemed by evaluators to be successful. These include the EDA i6 Challenge Programme (University of North Carolina 2014); the German FG (Intarakumnerd & Goto, 2018) and the Norwegian Innovation Clusters program (Technopolis Group, 2017) and the Swedish Competence Centres programme (Stern et al., 2013). A common feature of all these programs that arguably underpins their success is that **they have a clearly identified rationale, namely addressing issues that could significantly impede business performance**. These were usually framed around some type of market failure. Second, the specific interventions address

the real needs of firms, are intelligently thought through and matched with highly competent service delivery. (The importance of high-quality service delivery agents is noted in several evaluations).

With the exception of the RCT programs, which are quite recent, **all of the successful programs have been in operation for some time, and often decades.** For example, the US MEP Programme started in 1988, the Israeli Magnet Consortium in 1991 and Swedish Competence Centres programme in 1993. They are all still in operation. A huge benefit for established programs with strong bipartisan political support is that it permits program administrators and designers to effect incremental improvements which, over time result in more refined, effective and efficient delivery. Long-term programs also permit incremental leaning on the part of public and/or private program service delivery agencies, that is, those who actually work directly with firms to provide advice and/or assist in implementing change. In simple terms, time allows these agencies to understand what specific forms of assistance work.

A particular issue for programs, especially those requiring collaboration between universities/public research entities, **is ensuring the governance and system of incentives facing all major components, academics, university administrators, and firms are congruent and form a self-supporting eco-system.** For example, Fraunhofer has been in operation since 1948 and has time to evolve an appropriate system of incentives. 'Since Fraunhofer receives 2/3's of its funds from industry, it makes it relevant to industrial needs…turnover and mobility of researchers [between unis and industry] at…Fraunhofer is quite high…. [and] a key performance indicator for Fraunhofer is income and induced investment from the industry. Fraunhofer institutes are located next to universities and/or research facilities of companies in many regions and forming integrated research compounds in those regions. This 'co-location' concept makes it possible for three parties i.e., Fraunhofer, university and industry work closely, benefitting all three' (Intarakumnerd & Goto, 2018).

Somewhat similar to the point made about having consistent incentives for all parts of a complex service program where programs are delivered by multiple agencies, **co-ordination across agencies is critical**. Inoue and Yamaguchi's (2017) evaluation of SBIR in Japan identified a lack of co-ordination and conflicting departmental interests was a factor in the failure of the program.

It is arguable that in pursuing certain objectives **comprehensive 'wrap around' services are desirable**. Again, although not formally evaluated, start-up programs, such as those in South Korea and Japan, provide excellent examples of such comprehensive assistance, ranging from education and encouragement of budding entrepreneurs to firm initiation, commercialisation (bringing a product/service to market) and then into the expansion phase, including export.

Finally, some evaluations note that it is important to have **systems that capture on-going lessons learnt by both program delivery agencies and program participants and systems for the diffusion of these lessons to all service providers and participants**. For example, the US STEP Programme recommended that 'SBA managers should communicate with grantees the identified best practices to assess how they could be implemented at the state level' (2M Research 2021). Similarly, a recent UK government study of government business support programs was critical of current program policies, design and evaluation as they 'lack adequate information feedback channels from outcomes to the policy process…[and there is a failure to learn or to build on successes' (Coyle and Muhtar 2021). These lessons are equally applicable to Australia.

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Appendix A List of programs analysed[7]

(1) Country	(2) Name of the Govt. Program	(3) Govt Department Running Program	(4) Specific Purpose/Objectives of Program	(5) Who provided the service funded by the program- (was it specialist govt workers; private sector contractors, industry associations etc)	(6) Range of specific services provided under the program (assistance with finding and entering export markets; lifting productivity with re-engineering production processes; linking firms with university/private researchers etc)	(7) Methodology used	(8) Effectiveness of the program (Did it achieve its objectives)	(9) Does the program have grant/ funding?
USA	Manufacturing Extension Partnership (MEP) programme	National Institute of Standards and Technology (NIST)	The MEP program provides business, technology, and other forms of assistance. MEP services prompt intermediate business actions (including, but not limited to, equipment investment, enhanced plant layouts, employee training, process and quality improvements, cost reductions, and new products and marketing strategies) leading to improved business performance outcomes such as enhanced productivity, sustainability, and growth for its clients.	The program deploys a network of manufacturing experts (also known as manufacturing extension agents). MEP centres deliver services with some mix of in-house specialists and third-party providers. More than 1,400 non-federal staff and over 2,400 third-party service providers are involved in service delivery	Services that directly provide expertise, diagnostics, mentoring, training, and other support to help manufacturing establishments to upgrade, as well as access and referrals to other public and private resources.	Compare treated firms against an untreated 'control' group	Yes	Yes

[7] For details of the programmes please refer to the excel document.

	The EDA i6 Challenge Programme	Economic Development Administration, U.S. Department of Commerce	Innovation: Projects that nurture innovation broadly, and market-based applications for that innovation specifically through the: (1) creation of a broad-based, expansive culture of idea-generation and the useful application of that innovation through R&D at universities and research centers; (2) engagement of a diverse set of researchers, innovators, and practitioners; (3) engagement with industry professionals, investors, and successful entrepreneurs with innovation at its earliest stages. Entrepreneurship: Projects that develop a large number of high-growth entrepreneurs and create an ecosystem for them to experiment with and commercialize their innovation. Regional Economic Development: Projects that drive economic development through the lens of innovation and entrepreneurship	Each round of the competition was funded primarily by EDA, with supplemental funding and technical assistance was available from other federal agencies.	Providing funding and assistance to six wining projects ($1 million each). The U.S. Patent & Trademark Office (USPTO)and National Institute of Standards & Technology's Manufacturing Extension Partnership (NIST MEP) Centers also offered technical assistance to winning projects.	Compare performance of the entity pre- and post-treatment	Yes	Yes
	State Trade Expansion Programme (STEP) (partnered with the Small Business Innovation	The U.S. Small Business Administration (SBA)		To increase the number of small businesses that are exporting To increase the value of exports for small businesses that are currently exporting To increase the number of U.S. small		Compare performance of the entity pre- and post-treatment	Partial Success	Yes

	Research (SBIR) programme)			businesses exploring significant new trade opportunities				
	Small Business Technology Transfer (STTR)	STTR is administered by the Department of Defence (DoD), National Institutes of Health (NIH), Department of Energy (DoE), National Science Foundation (NSF), and National Aeronautics and Space Administration (NASA). Each of these research agencies has the flexibility to administer SBIR and STTR in line with its own unique		Stimulate a partnership of ideas and technologies between innovative small business concerns (SBCs) and Research Institutions through Federally-funded research or research and development (R/R&D). Stimulate technological innovation Foster technology transfer through cooperative R&D between small businesses and research institutions Increase private-sector commercialization of innovations derived from federal R&D		Compare performance of the entity pre- and post-treatment	Yes	Yes

		mission needs						
	The Small Business Innovation Research (SBIR) programme	The US Small Business Administration (SBA) serves as the coordinating agency for the SBIR programme.	Specific program purposes are to: (1) stimulate technological innovation; (2) use small business to meet Federal R/R&D needs; (3) foster and encourage participation by socially and economically disadvantaged SBCs (SDBs), and by women-owned SBCs (WOSBs), in technological innovation; (4) increase private sector commercialization of innovations derived from Federal R/R&D, thereby increasing competition, productivity and economic growth.	SBIR participating agencies (funds for technical and business assistance)	Providing technical and business assistance to SBIR Awardees, including access to a network of scientists and engineers engaged in a wide range of technologies, assistance with product sales, intellectual property protections, market research, market validation, and development of regulatory plans and manufacturing plans, or access to technical and business literature available through on-line databases. The purpose of this technical and business assistance is to assist SBIR Awardees in: (1) making better technical decisions on SBIR projects; (2) solving technical problems that arise during SBIR projects; (3) minimizing technical risks associated with SBIR/STTR projects; (4) commercializing the SBIR product or process, including intellectual property protections.	Compare performance of the entity pre- and post-treatment	Yes	Yes
UK	Manufacturing Advisory Services (MAS)	Department of Trade and Industry (DTI) now transformed to	Providing technical and strategic advice to the SMEs in the UK. The main aims of the scheme were to support improvements in areas such as efficiency, strategy or innovation, and in some cases,	The program deploys a number of manufacturing advisors depending on the levels designated to the business. It was administered by a private sector consortium of Grant Thornton, PERA, West Midlands Manufacturing	Online support, manufacturing diagnostic review on-site using diagnostic tools premised on the principle of “Manufacturing Excellence” co-developed with Warwick Manufacturing Group,	Compare treated firms against an untreated ‘control’ group	Yes	Yes

		Department of Business, Enterprise and Regulatory Reform (BERR)	following an independent review, awarded a small grant to applicants.	Consortium and South West MAS (before 2012 this was done at a regional level through the RDAs).	knowledge of technical know-how and logistics, funding, finding partnering organization, provide assistance to enhance the relationship and efficiency between Original Equipment Manufacturers and their supply chains. MAS services are categorized under following 5 levels: L1 – Telephone Helpline and Email / Website contacts - undertaking a level of 'triage' to identify the most appropriate assistance for each business. L2 – Manufacturing Reviews - identifying the interventions a business will undertake. This could be one-to-one (L4), one-to-many (L3) or brokered (L5) support and self-implemented strategies. Some businesses undertaking a L2 review will not receive further MAS support. L3 – Events - MAS organised a small number of events to deliver advice to multiple businesses simultaneously. L4 – In-depth interventions - providing funding for in depth consultancy services, at three levels: The MAS Foundation Service, The MAS Step Change Service and The MAS Transformation Service L5 – Active Referrals - brokering support from other Government schemes. This could happen at any stage in the MAS process, but particularly following an L2 review or the closing review of an L4 project. Where wider support was needed,			

					the advisor referred the client to the most appropriate scheme.			
	Business Basics Programme	Department for Business, Energy & Industrial Strategy delivered in partnership with Innovate UK and the Innovation Growth Lab (IGL) based at Nesta	1. Raise the productivity of small to medium-sized enterprises (SMEs) by 2. Drive innovation 3. Enable better investment decisions at a local and national level	Experts, Senior BEIS officials. it is delivered in partnership with Innovate UK and the Innovation Growth Lab (IGL) based at Nesta.	BBP consists of three key elements: 1. The Business Basics Fund is the main pillar of the program, delivered in partnership with Innovate UK and the Innovation Growth Lab (IGL) based at Nesta. The Fund provides grants to test the most effective ways of encouraging SMEs to adopt modern technology and management practices. 2. Partnership Projects enables BEIS to work with partners to deliver targeted projects e.g. in a specific place, sector or using specific techniques such as nudge or peer to peer advice. 3. The Business Support Evaluation Framework is designed for policy makers, analysts, evaluators and delivery bodies, to create a shared understanding of the evaluation standards expected.	Randomised Control Trials	No result found yet	Yes
	Catapult Network		Enhance business access to leading-edge technology and expertise. Reach into the research base for world-leading science and engineering. Create a critical mass of activity between business and research institutions.	The UK's best businesses, scientists, technical specialists and engineers	Accelerating business growth by equipping organisations with the right infrastructure, testing environments, demonstration tools and technologies to bring new products, processes and services to market Linking businesses and the research community together Informing policy development: working with government, regulators,	Compare performance of the entity pre- and post-treatment	Yes	No

			Provide skills development at all levels.		businesses and academia to develop practical, solution-focused and industry-relevant policy recommendations through input to government inquiries, participation in government advisory and strategy groups etc.			
	Nationwide innovation voucher scheme	Innovate UK, managed by Aston University, in partnership with Birmingham City University	To accelerate economic growth by stimulating and supporting business-led innovation.	Innovate UK and an external expert (e.g. knowledge-based organisations, consultants, developers, etc.)	As part of the program the participants will only get funding. There are four main stages for participation in the innovation voucher program: (1) application, (2) lottery and eligibility checks, (3) voucher claim, and (4) final payment.	Randomised Control Trials	Yes	Yes
New Zealand	The Growth Services Range (GSR)	Ministry of Economic Development	Accelerating development of firms with high growth potential and enhance their contribution to New Zealand's overall economic growth	GSR, NZTE and other agencies	Growth Services Fund (GSF), which offers funding assistance for firms to purchase external advice and expertise. Funding is available for up to 50% of the costs of approved projects and is typically up to $100,000 per company within any 3 year period Market Development Services (MkDS), which are provided by NZTE's offshore offices and comprises specialist information, advice and facilitation assistance GSF recipients receive intensive CMS from NZTE staff and get advice regarding other types of business assistance provided by NZTE. About 20% of firms that had received a	Randomised Control Trials	Partial Success	Yes

					GSF grant had also received another type of New Zealand Trade and Enterprise (NZTE) grant. Half of the group had also received assistance from other government agencies.			
	Provincial Growth Fund (PGF)	Ministry of Business, Innovation & Employment	Raising the productivity potential of regional New Zealand	PGF, its organisational scope includes the Provincial Development Unit (PDU), and partner agencies, with staff in Wellington as well as in regions (Auckland, Wellington and Christchurch are excluded).		Compare performance of the entity pre- and post-treatment		Yes
	The Regional Growth Programme (RGP)	The Ministry of Business, Innovation and Employment (MBIE) and the Ministry for Primary Industries (MPI)	Supporting regions to identify their opportunities and leverage them to increase jobs, income and investment, also to navigate government processes more effectively to realise their regional economic aspirations.	Government agency personnel and regional stakeholders (The RGP has evolved as a partnership between central government, regional and district councils, economic development organisations, Iwi, Māori, businesses and sector groups in the regions, working together to identify, prioritise and champion regional initiatives).	Drawing support from different Government agencies, and also working between Government agencies and the regional stakeholders and Māori with the aim of accelerating progress in areas of economic need identified by the regions. Helping key regional stakeholders to work together There are a number of resources available to the RGP across government agencies including: personnel (SRO, central government leads), facilities, funds, time, skills and expertise. Each region initially identifies their key economic opportunities. Then, an economic action plan is developed by regional leaders. Action plans are economic blueprints for each region and identify specific	Qualitative Assessment	Partial Success	Yes

					activities that will help increase employment opportunities, household income and investment. Central government agencies support regions to develop their plans and implement them.			
	The Primary Growth Partnership (PGP) and the Shellfish Production & Technology (SPATnz)	Ministry for Primary Industries	The PGP aims to: - Boost productivity, value and profitability in the primary sector; - Deliver long-term economic growth and sustainability across primary industries, from producer to consumer; and - Encourage more private investment in research and development in New Zealand. The SPATnz aims to deliver: - Knowledge and capability to produce hatchery-reared GSM at a commercial scale; - Selectively bred spat of GSM with enhanced production and market characteristics; and - Hatchery and sea-based nursery infrastructure.		Providing fund	Compare performance of the entity pre- and post-treatment	Yes	Yes
	Incubator Support Programme	Ministry of Business, Innovation and Employment	Developing and supporting business incubators in New Zealand.	In 2011/12 government support to business incubators was $4.4 million in funding to eight incubators, plus $0.4m for NZTE's Incubator Development Unit (IDU) and $0.1m miscellaneous grants. The government also supports incubated firms through the Seed Co-investment Fund and R&D grants to businesses.	Government funds incubators to: - Address information problems, by building the capabilities of businesses and raising their profile in the market - Link different aspects of the market around start-up businesses together to overcome the coordination difficulties.	Qualitative Assessment	Yes	Yes

Singapore	The Capability Development Grant (CDG) scheme	Managed by Enterprise Singapore (formerly known as SPRING Singapore) *(under Ministry of Trade and Industry)*	The Capability Development Grant (CDG) scheme is a financial assistance program administered by SPRING that aims to help local firms, especially small- and medium-sized enterprises (SMEs), build capabilities and become more competitive.	SPRING (Standards, Productivity and Innovation Board) Singapore, a statutory board under the Ministry of Trade and Industry, was established with the aim of helping Singapore enterprises grow as well as to build trust in Singapore products and services	Financial assistance The CDG scheme helps firms to develop capabilities across 10 project areas by defraying up to 70 per cent of the qualifying project costs SPRING also works with CDG firms to understand the areas for improvement and scope the projects based on their needs.	Compare performance of the entity pre- and post-treatment	Yes	Yes
	Enterprise Singapore's (ESG) loan Schemes	Ministry of Trade and Industry	Complementing commercial lending and avail financing to local SMEs through the sharing of the risk of loss on loans with participating financial institutions.	ESG's loan schemes and 16 participating financial institutions	The schemes encourage lending by financial institutions and assist deserving borrowers to gain access to financing by reducing the risk exposure of the lenders in areas where they are more risk averse or where they see minimal benefit based on the risk profile of borrowers. ESG offers a suite of loan schemes, yet the study focuses on the Equipment, Micro and Enhanced Micro loan schemes	Compare performance of the entity pre- and post-treatment	Partial Success	No
	Isprint Scheme	IMDA (Infocomm Media Development Authority)	A financial assistance scheme that helps local SMEs defray the costs of automating their business functions through information technology.	IMDA	Under the scheme, IMDA provides funding support to local SMEs for the first- time automation of each business function. It covers both pre-approved packaged solutions that are ready to use and customised solutions that are tailored to firms' needs.	Compare treated firms against an untreated 'control' group		Yes

	Industry Transformation Programme (ITP)	Government of Singapore	Facilitating innovation, trade and creation of more productive and higher quality jobs and ensuring that sufficient amount of qualified local labour force will be readily available to occupy those jobs.			Qualitative Assessment	Yes	No information provided
Scadinavian	The Swedish Competence Centres programme	VINNOVA and the Swedish Energy Agency	Performing industrially relevant research Producing high-quality scientific outputs Developing scientifically qualified human capital with skills in industrially relevant areas Encouraging the development of interdisciplinary critical mass within academia in areas of industrial relevance Changing research culture Producing innovations in the participating companies	Three partners normally fund the centres: industry, university and a state agency	Providing fund to CCs	Compare performance of the entity pre- and post-treatment	Yes	Yes
	Regional Venture Capital Funds	Several actors have been commissioned to be project owners and operate one or more of these projects:	increase access to equity capital for small and medium-sized enterprises in Sweden	Venture capital funds, private investors and the companies	The investments go to SMEs that are in the seed, start-up or expansion stages Venture capital funds address a gap in the supply of capital among SMEs with high growth potential and not compete with the private market. The venture capital funds invest in conjunction with a private	Descriptive Only	Yes	Yes

		Innovationsbron, Almi Invest, Saminvest, the Norrland Fund (Norrlandfonden) and the Sixth AP Fund (Sjätte AP-fonden)			commercial independent actor and the investment must be made on equal terms. The venture capital funds revolve i.e. that when the funds' holding is realised the funds must be reinvested in the region. This also means that the funds shall strive to maintain their capital base.			
	Innovation Fund Denmark (IFD) including four largest programmes: Grand Solutions, InnoBooster, InnoFounder and Industrial Researcher	Danish government	Grand Solutions: Invest in high quality research and innovation projects with the potential to create knowledge, growth and employment in Denmark. InnoBooster: Enhance innovation in small and medium-sized enterprises (SMEs). InnoFounder: InnoFounder is a one-year incubator course offered to new graduates with innovative and scalable business ideas Industrial Researcher: Promoting innovation through collaborative research between private company/public institution and public research institution	Danish government		Descriptive Only	Grand Solutions: Partial Success InnoBooster: Yes InnoFounder: Yes Industrial Researcher: Yes	Yes

	The Danish Growth Fund (DGF)- is a government-backed, regulated fund	Danish government	(DGF) is a public investment fund that aims to make a significant contribution to innovation and economic growth by co-financing the genesis, growth and development of small and medium-sized enterprises (SMEs) of high growth potential		Venture activities: DGF provides capital to entrepreneurs either through direct equity investments or through indirect equity investments managed by other funds or via fund of funds (FOF) investments. Loan and guarantee activities: By providing loans and loan guarantees, DGF provides capital for entrepreneurs and SMEs which lack sufficient collateral and/or a track record to obtain a bank loan on normal market terms.	Compare performance of the entity pre- and post-treatment	Yes	Yes
	Norwegian Innovation Clusters (NIC)	Organised by Innovation Norway, in a joint effort with Siva (the Industrial Development Corporation of Norway) and the Research Council of Norway	Promoting and improving collaboration activities in the clusters.	A team from Innovation Norway, advisers from the Research Council and Siva The program is funded by the Ministry of Trade, Industry and Fisheries and the Ministry of Local Government and Modernisation	The government supports the cluster activities by financing cluster facilitators and common activities in each cluster within the framework of the program.	Compare treated firms against an untreated 'control' group	Yes	Yes
Germany	Central SME Innovation Programme (ZIM)	Federal Ministry for Economic Affairs and Energy	It supports innovation activities by SMEs, including industry-science collaborations and technology transfer. It supports the innovation and competitiveness in SMEs. Supported are research and development projects that lead to	The program does not provide any service. it only provides funding/grant to innovative ideas	There are following options from which companies can choose the one that best suits their needs: ZIM cooperation projects - the program provides funding for R&D work carried out jointly by two or more companies, or by one			Yes

			new products, technical services or better production processes. IT has following objectives: Enhanced innovation potential Stronger international focus Simplified program structures		company and one or more research institutes. ZIM individual projects - the program provides funding for individual companies doing their own in-house R&D work. ZIM cooperation networks - the program provides funding for external network management work carried out by innovative networks that comprise at least six SMEs which jointly develop a common innovation.			
	EXIST	Federal Ministry for Economic Affairs and Energy	Aims at improving the entrepreneurial environment at universities and research institutes. It also aims at increasing the number and success of technology and knowledge-based business start-ups. It promotes a lively and lasting entrepreneurial culture at public and private universities. Key objectives of EXIST 1. Establish a culture of entrepreneurship in university teaching, research and management for the long term. 2. Consistently translate the findings of academic research into economic value – also for the purpose of the technology transfer mandate for universities. 3. Promote the huge potential for business ideas and entrepreneurs at universities and research institutions in	EXIST is co-financed by funds of the European Social Fund (ESF).	The EXIST program comprises three schemes: EXIST Culture of Entrepreneurship supports universities in formulating and implementing a comprehensive and sustained university-wide strategy for increasing entrepreneurial culture and spirit. EXIST Business Start-up Grant supports students, graduates and scientists in preparing innovative technology and knowledge based start-up projects. EXIST Transfer of Research funds both the resource development necessary to prove the technical feasibility of start-up ideas based on research and the preparation necessary to launch a business.			Yes

			a targeted manner. 4. Significantly increase the number of innovative business start-ups and create secure new jobs in the process.					
	Fraunhofer Institute (Germany) (FhG)	Private organization. It is world's leading applied research organization. Govt. intervention is limited	Its mission is to carry out research of practical utility in close cooperation with its customers from industry and the public sector. As a source of inspirational ideas and sustainable scientific and technological solutions, Fraunhofer provides science and industry with a vital base and helps shape society both now and in the future.	The employees of the organization conduct research. FhG also acts as intermediary between universities and firms. Professors, university students, research assistants	It supports research in different field and support their employees to but technology-based products that support the society. FhG adopted geographical concept by working with local industries and universities in the fields based on specialization of particular geographical areas.	Qualitative Assessment	Yes	No information provided
	German Corporation for International Cooperation (GIZ)	Federal Ministry for Economic Cooperation and Development (BMZ)	To deliver effective solutions that offer people better prospects and sustainably improve their living conditions. we help companies and foundations in achieving the Sustainable Development Goals of the 2030 Agenda and realising their worldwide business potential in developing countries and emerging economies. We advise private sector firms and civil society actors on individual cooperative projects, either under direct commissions or in partnerships. We support projects from their inception and design all the way to implementation in the field.	People working at GIZ	GIZ supports people in acquiring specialist knowledge, skills and management expertise. We help organisations, public authorities and private businesses to optimise their organisational, managerial and production processes. And, of course, we advise governments on how to achieve objectives and implement nationwide change processes by incorporating them into legislation and strategies. The political and social framework plays a crucial role in ensuring reforms are effective and sustainable. Without an enabling environment, changes remain superficial and have no real impact in the medium term.			No

South Korea	Korea Institute of Startup and Entrepreneurship Development (KISED)	Ministry of SMES and startups	To contribute to the development of the national economy through the growth of startup businesses and job opportunities and promote the technology-based startups of future entrepreneurs by cultivating entrepreneurial spirit. KISED core values includes: innovation, Customer Centricity, Communication and Trust	Vary depending on the service provided	It provides range of services based on the stage of the business. Startup Commercialization: Pre-startup Package, Early-Stage Start-up Package, Startup Scale-up Package, Second Chance Startup Package, Tech Incubation Programme for Startups (TIPS), Service Voucher for Startup, Corporate Venture programme, 100 Startups from Materials, Parts & Equipment, Local Creator Programme Startup Commercialization & A New Market Pioneer: -> Partnership with Global Companies -> 200 Baby Unicorns Startup Education: Youth BizCool, Hands-on Startup Education, University Entrepreneur Center, Online Startup Education, Startup Mentoring Platform, IEum Overseas Expansion: Global Startup Academy, Korea Startup Center (KSC), Global Acceleration Programme for Startups (GAPS)) Events & Networking: K-start-up Week COMEUP, AI Championship, Challenge! K-Startup, Youth BizCool Festival Startup Infrastructure Maker Space, Maker Culture, Tech-			Yes

					based Startup Center for Seniors, Center for Creative Economy Innovation (CCEI), Pangyo Startup Zone, Start-up park, One-man Creative Company Support Center Research & Analysis			
	TIPS (Accelerator Investment-Driven Tech Incubator Programme for Startup)	South Korean government along with public and private partners	To identify and nurture the most promising startups with innovative ideas and ground-breaking technologies.	It appoints and designates successful venture founders – who are now angel investors and leaders of technological enterprises – as their incubators/accelerators. It then offers seamless service encompassing angel investor networking, incubating, mentoring/professional support and matching R&D funds.	Provides support right from incubation stage			No
	K-startup grand challenge	Launched by National IT Industry Promotion Agency (NIPA) and funded by the Ministry of SMEs and Startups of South Korea	To invite foreign start-ups to come to Korea and cooperate with local VCs and companies. Inviting start-ups from overseas is to assist Korea's evolution into a prominent startup business hub as well. To promote the expansion of an open entrepreneurship ecosystem in Asia and assist in South Korea's evolution into a prominent startup and business hub in the region. The key purpose of K-Startup Grand Challenge is to promote collaboration and exchange of ideas among startups from Korea and around the world.	Experts in the area	KSGC 2021 will offer 60 teams and entrepreneurs an all-expenses-paid, 3.5-month residency program in South Korea that includes access to expert guidance, co-working spaces, state-of-art R&D labs, corporate partnerships, entry to Asian markets, and more.			Yes

	Startup Voucher Programme	Korea Trade-Investment Promotion Agency & Korea International Trade Association in association with Ministry of SMEs and Startups	To support SMEs and middle-standing enterprises to easily select programs/services and their implementing organizations/institutions by providing the Export Voucher that lists programs/services by different categories To remove barriers between government departments' export support projects and to allow small and medium-sized enterprises to freely select export support projects that fit their export capabilities.	Expert in the area	startups' preparation to advance into overseas, marketing for overseas buyers, matching overseas investment, and supporting implementation of overseas advancement. Companies that have received export vouchers can freely select, purchase, and use services required for export business at the export support-based utilization business portal (www.exportvoucher.com) 6,000 services are registered in 13 fields Preparation stage: Produce foreign language webpage, translate data in foreign language, optimize design, consulting on overseas expansion strategy, educate on trade and international marketing, etc. Beginning stage: Marketing through TV/newspaper/SNS, search engine marketing, global market research, support business matchmaking, support for participating overseas exhibition, launching a new product, etc. Contract stage: Check buyer's credit, write a contract paper including payment, manage export distribution, etc. Global expansion stage: Support to			Yes

					build local branch office, consulting on M&A, etc.			
Israel	The Pilots Programme	Innovation Authority with different government departments depending on the industry	To help high-tech companies conduct semi-commercial demonstrations of new technologies. The programs allow Israeli technology companies to receive support for R&D or pilot programs (for testing feasibility / proving value of an existing technology in a work environment that simulates the target market) in selected fields	Regulatory assistance may also be provided by the government	Provide funding for R&D and Regulatory assistance may also be provided by the government			Yes
	MAGNET Consortiums	Innovation Authority (Technology Infrastructure division)	To provides grants for R&D collaboration as part of a consortium (a group of industrial companies and research institutions developing technologies together). To assist in the development of generic technologies in important fields in the global market, in which Israeli industry has, or may have, a competitive advantage. Since this incentive program supports the funding of infrastructure technologies, it allows distribution of knowledge and cooperation between companies operating in the same field, which may be difficult to achieve otherwise. The program is aimed at Israeli industrial companies developing commercial products, who are simultaneously interested in adapting new technologies, from which a new advanced generation	Not Specified	This incentive program includes three kinds of consortiums: Industrial consortium – this consortium includes several different fields of expertise with the participation of technology leaders from Israeli industry that have a significant presence in the global market and researchers from academia with broad knowledge in the fields relevant to the consortium. The consortium's products must have a potentially large influence on the Israeli economy. Knowledge-Building Consortium – this consortium focuses on applied academic studies in fields in which industry is not yet ready to play a significant part in the R&D process, but where there is significant potential to promote it via knowledge maturing. The industrial companies'			No

			of products can be developed. In addition, the program is also aimed at Israeli academic research groups that focus on scientific or technological research and are interested in stimulating applied research and cooperating with industrial companies.		role in this consortium is to serve in a supporting and mentoring capacity. Ma'agadon – this consortium is relevant for a limited number of companies that receive assistance from a small number of academic researchers for focused technological development that may have a significant influence on the companies' business activity.			
	Bi-National Funds Programme: •India-Israel Industrial R&D and Technological Innovation Fund (I4F) – Israel-India •Israel-U.S. Binational Industrial Research and Development (BIRD) – Israel-United States	Israel Innovation Authority & government of specific country (Department of Science and Technology, (India), US Government, Singapore Economic Development Board, Ministry of Trade, Industry & Energy (Korea)	To encourage international collaborations for development and application of innovative technologies in all fields and the examination of their feasibility in order to help Israeli companies grow and increase their competitiveness in the international market by establishing strategic global connections, access to real international conditions in order to test their products, breakthrough and scale-up of their products in global markets.	Government provides fund based on the proposal submitted.	• Assistance in finding a foreign partner. • Financial assistance of up to 50% of the approved R&D budget in accordance with the type of program in the fund. • Each fund operates different programs. Further details can be found on the funds' websites			Yes

	•Singapore Israel Industrial R&D Foundation (SIIRD) – Israel-Singapore •Korea-Israel Industrial R&D Foundation (KORIL) – Israel-Korea							
	The Workshop programme	Israel Innovation Authority	an association for advanced technology studies to help High-tech companies train workers in advanced development professions, particularly in AI.	Expert in the field will provide knowledge. Four of these workshops are slated to be held in 2020-2022.	professional training			No
Japan	Organization for Small & Medium Enterprises and Regional Innovation, JAPAN (SME Support, JAPAN）	Ministry of Economy, Trade and Industry (METI)	We empower SMEs that drive Japan's Economy. to increase the number of SMEs tapping into overseas markets as Japan’s comprehensive SME policy implementing body. To achieve this goal, we are currently strengthening our global business matching efforts mainly through CEO Network Enhancing Projects and J-GoodTech, an online business matching platform with about 20,000 registered Japanese SMEs and overseas companies. 1. Chase your dream (With a variety	Might vary depending on the service	Hosts CEO Network Enhancing Projects in major cities throughout Japan for SMEs seeking overseas expansion and CEOs from abroad seeking partnerships with Japanese companies. This project focuses on building relationships between Japanese SMEs and overseas companies through company visits, 1 on 1 business meetings, lectures and networking events. Overarching services provided: Consulting services, Dispatching experts, Talent Development, Information, funding, Supporting			Yes

			of support tools, SME Support, Japan embraces ambitious SMEs & entrepreneurial spirit) 2. Capture Demand (Capture new demands is essential for SMEs to grow the businesses. SME support, Japan helps "create" & "capture" demand by refining value & expanding markets for products & services) 3. Embrace Change (In a rapidly transforming market, monitoring changes & redefining competitive edge is critical for SMEs. SMEs Support, Japan provides variety of support tools that meet the needs of ever-changing environment & SMEs)		SME-related Organizations A wide range of services to help SMEs find solutions at every phase of their business cycles are provided: 1. Start-up phase (Incubation Facilities, Utilization of Regional Resources / Agri-Commerce-Industry Collaborations / New Partnerships) 2. Growth phase (Market expansion, Online Matching, Overseas Business Development) 3. Maturity Phase (Business succession, Business Turnaround, As the headquarters for Japan's SME turnaround measures, we provide various assistances to regional business turnaround support centers initiating the process for SMEs.			
	J-startup	Ministry of Economy, Trade and Industry (METI)	The J-Startup project aims to make winning startups in the global market and bring new value to the world. We will create successful, cutting-edge Japanese startups and empower Japan's startup ecosystem. Those successful startups are expected to bring new values to the world, and empower Japan's startup ecosystem. the J-Startup Programme cultivates the brightest of Japan's startups to succeed in the world market. Recommenders from leading business communities determine and select a group from over	top VCs, accelerators, and corporate VCs, scholars and experts	• Granting private business spaces and fee preferences • Professional mentors from leading technology companies • Collaboration opportunities with large companies in similar fields • Welcoming programs from Ministers and other important figures • Marketing services designed for startups to succeed in overseas markets • Opportunities to exhibit at the world's largest tech conferences, such as CES and SLUSH			No

			10,000 Japanese startups to join the program. Representatives from the startups will demonstrate their products and services during the International Innovation Platform in the conference					
	Impulsing Paradigm Change through Disruptive Technologies (ImPACT) programme	Council for Science, Technology and Innovation	The goal of creating disruptive innovation through ambitious R&D topics, thereby bringing about a revolutionary change to Japanese industry and society. The ultimate goal of ImPACT is to turn Japan into the country most favorable to innovation and a country brimming with the spirit of entrepreneurship and business start-ups. There are two targets that need to be met for the successful attainment of these goals: Creating disruptive innovation and presenting an action model for innovation creation	Impact has incorporated the project manager (PM) method i.e. a producer who sets high targets, chooses a cast of the very finest researchers and implements high-risk, high-impact R&D The committee selecting the project are Minister, State Minister, Parliamentary Vice-Minister, CSTI executive members, external experts	Providing assistance for research			Yes
	Small Business Innovation Programme (SBIR)	Ministry of International Trade and Industry & Ministry of Economy, Trade and Industry	It seeks to provide consistent support to small businesses' research and development (R & D) as well as actual utilization of its fruits for the purpose of promoting business activities that utilize new technologies owned by small businesses.	Support is being provided by giving necessary funds to the business	winners can receive (a) loans with low interest rate, (b) more opportunities to submit bids for government procurement, (c) fees exemptions for steps such as patent registration, and (d) tax breaks. SBIR will make efforts to increase opportunities for directing & budgets of the national government and governmental agencies to small	Compare treated firms against an untreated 'control' group	Somewhat effective	Yes

					business owners. SBIR provides support for actual utilization of fruits of R & D carried out using Subsidies.			
OECD/NESTA/WEF	Training Programme to Encourage Social Entrepreneurship		Social entrepreneurship training includes training not only in entrepreneurial skills but also social leadership skills and social entrepreneurial identity development	The organizers received support for the program design and execution from a large and dedicated group of advisors with either senior business experience or teaching experience at business schools.	The training consisted of two major components: accelerating social entrepreneurial activity and promoting leadership skills associated with a social entrepreneurial identity. The 50 participants were coached and met experts in leadership, social entrepreneurship, and related topics. The bus trip was followed by a six-month coaching program. The main focus of the coaching period was to provide networking opportunities, coaching, and other support for developing the ventures	Randomised Control Trials		No
	InnoCAP: Increasing the innovation capacity of SMEs	Austrian research promotion agency (FFG)	Conduct an experimental pilot program to evaluate if additional support actions based on software and guiding instruments increase innovation ability in SMEs.	FFG	Conducting a large-scale randomised control trial (RCT) to test if scalable support measures can increase the innovation capacity in SMEs in order to gain evidence on the effectiveness of the support measures in fostering innovation capacity in SMEs. Through an evidence-based RCT, FFG will pilot a new innovative support scheme to address one of the major challenges that most funded projects have: bringing new innovative products/services/business models			No

					to the market, based on the results of publicly funded research projects.			
	DCS-iSMEs: Design Customised Support for Innovative SMEs	The Business and Cultural Development Centre (KEPA)	Setting up a brand-new innovation support service, which is a service that will enable both the country make profit out of its investments on SMEs and the SMEs further develop their operations by enhancing the use of Design		Findings will be used to come up with a feasibility study for expanding the program, which may include a larger impact evaluation experiment.			No
	Create4value: Creative collaboration to provide value for first time innovators - effective engagement of stakeholders and users in co-creation processes in SMEs	Poznański Park Naukowo Technologiczny (PPNT)	Looking at whether a process of co-creation can be used to encourage first time innovators Improving current methods of co-creation to meet the needs of first-time innovators Exploring how to engage users and stakeholders in the process.		Findings will inform PPNT's future policy offer; provide insights for other agencies on the use of co-creation and help to elaborate the method of assessing such support schemes in future experiments. The results will assist innovation agencies, stakeholders and regional authorities to test or design new schemes by using randomised control trials (RCTs).			No
	DINNOS: Diversity Innovation Support	Greater Birmingham Chambers of Commerce and researchers	Preventing and reversing the adverse impact of age diversity on innovation		The program consists of cognitive training for older employees as well as leadership training for entrepreneurs that seeks to reduce age stereotypes and associated			No

	Scheme for SMEs	at Aston Business School, Bergische University Wuppertal and the Kienbaum Institute			conflicts and enhance appreciation of age diversity			
	InReady	Lithuanian Innovation Center	Aims to design a service that supports startups dealing with investors more effectively. The project aims to bring insights from three different agencies across Europe, that would provide valuable lessons about the different startup readiness levels in various European countries.	Via web-tool	readiness of startups for investment pitching			No
	HeadsUp!	Enterprise Nation working with Brunel University London as part of a collaborative research project	The program looks at boosting the performance of small businesses by adopting digital technologies in order to increase company productivity. Our training helps business owners be more productive. The support will help you save time and grow faster. The Project will be delivered by engaging small businesses to take part in certain training sessions and activities (Training) and the results will be measured by changes in revenue, output and employee satisfaction.	Accredited coaches, provide productivity tools	Accounting and finance, Collaboration, sales and marketing, Time management			No

	Local Productivity Club NOTE: This program is basically an output of Business Basic Programme of UK.	Department for Business, Energy and Industrial Strategy. Funded by Innovate UK	The club concept aimed to teach and encourage implementation of basic tools and techniques that have been proven to increase productivity to local SMEs using a club format with expert mentoring and coaching in between. The key objectives stated were: 1. To develop a method to identify, invite and encourage relevant organisations to join a productivity club 2. Through regular club meetings with support in-between and representation from different organisational levels create effective learning, motivation, peer pressure and sharing of experiences across business boundaries enable the application of tried and tested management techniques within these organisations. 3. Through this structured and motivational approach to demonstrate significant productivity gains within a 3-4-month window from the start of the club	Consultants.	Training programs; club meetings; expert training; Measurement of productivity before, during and afterwards; Benchmarking before and afterwards	Compare treated firms against an untreated 'control' group	No	No
	Artificial Intelligence in London's hospitality and retail SME sector	Innovate UK. Project lead by London's hospitality and retail SME sector Mayor of	To trial the effectiveness of different forms of business support and how they affect the uptake of Artificial Intelligence technologies in London's hospitality and retail SME sector Specifically, to increasing productivity in London's SME retail	Matching SMEs with AI vendors via a series of events	Stream 1 will use a market convening methodology, which involves matching SMEs with AI vendors via a series of events, and allowing the supplier market to explain the opportunity through case studies and live demonstrations. This light touch method is based on 'letting the tech speak for itself' in			Yes

		London's Office	and hospitality sectors, through the adoption of AI 'chatbots' and marketing automation systems.		order to encourage uptake. Stream 2 is a more targeted intervention, which will provide SMEs with a £1,000 innovation voucher. By providing external expert support we will see if we increase uptake of AI amongst SMEs, and to realise the productivity potential of the technology.			
	People Skills+: An innovative management and leadership approach to boosting SME productivity ## This project is inactive now.	Innovate UK. Project lead Chartered Institute of Personnel and Development	Aimed at developing methods for enrolling 'hard-to-reach' SMEs - lower-productivity firms which lag significantly in people management.	Independent local HR	The project will therefore increase the awareness of business practices, increase desire for adopting better practices, make the costs and benefits of doing so clearer, and provide trusted advice from local partners.			No
	Global Business Innovation Programme (GBIP)	Innovate UK	GBIP can support high-growth innovative businesses to develop, explore and exploit the opportunities that exist in specific markets and technology and innovation areas. GBIPs provides the sort of detailed market knowledge, introductions and cultural insight that SMEs would find difficult to generate themselves. The Program is designed to help		GBIP is delivered in 3 stages: > Prepare for the market > Visiting the market > Exploiting the opportunity			No

			innovate companies find R&D partners, build collaborations and explore R&D and innovation opportunities internationally					
	The Scale-up Programme	Innovative UK EDGE	To provides one-to-one, bespoke and funded support centred around innovative scaleups' specific needs for scaling a business for growth.	A board of high calibre 'Scale Up Directors', Strategic Advisory Board	Participants are assigned a Scale Up Director who works with them as their designated single point of contact, to identify key scale up challenges and enablers that the collective resources, skills and connectivity of the board can address. They help in access to funding and finance, internationalisation, infrastructure and internal operations, intellectual property (IP) and talent acquisition and retention			Yes
	Business Training Programme	Training partner Business Bridge				Randomised Control Trials		
Mexico	Capacity Building Support Programme	Mexican development finance institution Financiera Nacional de Desarrollo Agropecuario, Rural, Forestaly Pesquero (Rural Finance Developmen	Providing grants to rural financial institutions for technical assistance, which is provided through a network of accredited specialists.	A network of accredited specialists FND has worked with more than 500 financial intermediaries, including credit unions, cooperatives, non-deposit taking financial institutions (SOFOMES), and producers' associations to increase access to credit in rural areas	Technical assistance, which is provided through a network of accredited specialists with extensive experience in supporting financial institutions e.g., credit risk management, trainings to increase the skills and capacity of management and staff and IT systems selection. Equipment support (e.g. computers, copiers and desks) to support thee opening of branches and/or expansion of operational capacity in rural areas.	Compare treated firms against an untreated 'control' group	Yes	Yes

		t Agency, FND).			Financial support in the form of capitalization, guarantees to support credit access and interest rate subsidies. The median grant amounts were about 70,000 Mexican pesos (4,000 USD) for technical assistance, 340,000 pesos (19,000 USD) for equipment and 1,600,000 pesos (89,000 USD) for capitalization.			

Appendix B List of programs not analysed[8]

(1) Country	(2) Program name	(3) Dollar Value	(4) Size of firm	(5) Industry sector	(6) Specific regions
USA	TWI program	By June 1945 the dollars and cents savings actually accomplished through TWI services at Picatinny Arsenal had amounted to $6,800,000.		Various industrial areas	TWI divided the country into 22 geographical districts according to the main industrial areas: Northern New England Southern New England, Upper New York State, Metropolitan New York, New Jersey, Eastern Pennsylvania and Delaware, Maryland and Virginia, North and South Carolina, The Southeastern States; the Ohio Valley (that is, Southern Ohio, Southern West Virginia, and Kentucky); Western Pennsylvania and Northern West Virginia; Northern Ohio; Michigan; Indiana; Illinois and Wisconsin; the North Central States; the Middle States; the Western Gulf and Rio Grande country; the Rocky Mountain States; Southern California; Northern California; and the Pacific Northwest; New York State
UK	Sector mentoring challenge fund	Up to £1million is available	SMEs	Different business sectors: manufacturing, construction, Trad, Inforcomms, business services, admin. services and other services.	Not mentioned
	Manufacturing growth programme	Funded by European Union – European Regional Development Fund	SMEs	Manufacturing	West Midlands, Yorkshire and Humber, parts of the East Midlands and South East.

[8] For details of the programs please refer to the excel document.

	Start and growth Programme	The program has assisted almost 8,500 start-ups, with £90m of business funding secured, 15,000+ jobs created in those businesses.	small businesses (start ups)	Not mentioned	Nation-wide
	Business Boost Trial	Not mentioned	SMEs, typically micro-businesses –	SMEs from different areas and different sectors	Nation-Wide
Singapore	Productivity-innovation-project	Not mentioned	All	Construction-related companies: supports the concept of Design for Manufacturing and Assembly (DfMA), and Integrated Digital Delivery (IDD).	National-wide
	Productivity-solutions-grant	Not mentioned	SMEs	Retail, food, logistics, precision engineering, construction and landscaping industries	National-wide
New Zealand	"New Zealand's Aid Programmes in the Cook Islands, Niue, Samoa and Tokelau"	New Zealand's total assistance to Tokelau in 2014-15 was NZD24.6m.	Not mentioned	New Zealand's budget support operations in each country are different e.g., In the Cook Islands, New Zealand provides Sector Budget Support (SBS) in tourism and education.	Cook Islands, Niue, Samoa and Tokelau.
	R&D grants	Three broad programs: Growths ($134,927,861),	Not mentioned	Predominant sectors: manufacturing, services, agriculture, forestry and fishing, constructions…	Nation-wide

		Project ($24,114,907), Student ($6,402,790)			
Scandinavian	State Counselling programme	Not mentioned	Start-ups and SMEs	All	Nation-Wide
OECD/NESTA/WEF	Nationwide innovation voucher scheme in the United Kingdom	support of up to 5,000 GBP for engaging the services of experts, e.g., from universities, research institutes or IP advisors, when pursuing an innovation-related project.	SMEs	All	Nation-wide
	SIVA (Selskapet for industries)	SIVA services more than 5,000 companies, and is a partner in more than 70 innovation companies, 40 real estate companies, and is present at more than 130 locations	SMEs	All	Nation-wide
	The Advisory Institute in Northern Norway (Veiledningsinstituttet i Nord-Norge –VINN)	Not mentioned	Not mentioned	Private and public sectors	Northern Norway
	Business Advisory Service (Ireland)	Budget allocation in 2013 and 2014 for a 5-year matching-	SMEs and entrepreneurs	All	Nation-wide

		contribution CAD 100 million			
South Korea	Kotra (Korea trade-investment promotion agency)	Not mentioned	SMEs	All	Nation-wide
	Korea SMEs and Startups Agency	Not specified	SMEs	Not specified	Nation-wide
Israel	Innovation Labs programme	NIS 4 million to each project	Not specified	Companies interested in innovation	Nation-wide
	Generic R&D Incentive Programme for Large Companies	Grant of 20%-50%	Large Israeli companies that employ at least 200 employees	Not specified	Nation-wide
	Early Stage Companies Incentive programme	NIS 10 million each year	Israeli startup companies	All sectors	Nation-wide
	Support Programme for different specific fields	Maximum 85% grant for their product	Both large and small company can apply	Companies developing products in the fields of space that will be installed on satellites or at ground control and navigation stations, as well as for companies developing equipment for calibration and testing of these products or that are related to the operation of satellites including installation of different versions of sellable satellites for export.	Nation-wide
	Technology Knowledge Direction and Transfer Programmes (KAMIN, NOFAR,	Not specified	All firms	All sectors	Nation-wide

	Technology Import, MAGNETON, and Application Institutes)				
	MEIMAD Programmes	Grant of 50%-90% in accordance with the type and nature of the activity.	Small and medium companies (Up to US$100 million in sales per year	Defense and commercial markets	Nation-wide
	MOFET (R&D in the Manufacturing Industry)	30%-50%	Not specified	Manufacturing	Nation-wide
	Coding Bootcamps programme	Equivalent course fees	To graduates	Technology	Nation-wide
	Back to Tech Incentive Programme	Not specified	Not specified	Technology	Nation-wide
	High-Tech Specialization for First Job Employees (Juniors)	NIS 50,000 for a candidate eligible for internship	Small and large companies	High-tech	Nation-wide
	Human Capital for High-Tech Fund	Max NIS 15 million each project	Not specified	High-tech	Nation-wide
	Women-Led entrepreneurship programme	No info provided	No info provided	No info provided	Nation-wide
	Knowledge Commercialization (includes 3 sub-programmes MAGNETON, Knowledge Import, Continued MAGNET)	A total of NIS 3.4 million for a period of up to 24 months.	Not specified	New product and innovation	Nation-wide

Appendix C Key characteristics of programs analysed

(1) Country	(2) Name of the Govt. Program	(3) Dollar value		(4) Size of firm	(5) Industry sector	(6) Specific regions	(7) Eligibility Criteria
		Govt Funding	Funding to Participants				
USA	Manufacturing Extension Partnership (MEP) programme	The FY 2021 appropriation for the MEP program is $150 million	MEP is providing approximately $8 million total funding for projects that support Advanced Manufacturing Technology Services/Industry 4.0	SMEs	Manufacturing	In all 50 U.S. states and Puerto Rico	These business assistance services are delivered at the establishment level; typically to existing (as opposed to start-up), small and midsize manufacturing establishments.
	The EDA i6 Challenge Programme	$3 billion EDA received from President Biden's American Rescue Plan	Each of the six winning projects received $1 million in funding	Entrepreneurs, start-ups, and small businesses	Multiple industry sectors	Six EDA regions Geographic focus: 2010: St Louis MSA, Atlanta GA and the South eastern U.S., Northeast Ohio, State of New Mexico, State of Oregon, Pittsburgh - PA region 2011: State of Florida, New England States, State of Iowa, I-20 Innovation Corridor (North Louisiana, South Arkansas, West Central Mississippi, Northeast Texas), Michigan - National, State of Washington	Small businesses and entrepreneurs with the gap financing needed to start or expand their business.
	State Trade Expansion Programme	$19 million in FY 20 funding to 48 grantees in Year One	Grant ranging from $50,000 (minimum) to	Small businesses	All	The program offers competitive grants to all 50 states: the District of Columbia; and the Territories of	Small businesses with export development.

	(STEP) (partnered with the Small Business Innovation Research (SBIR) programme)		$2,000,000 (maximum)			Puerto Rico, the U.S. Virgin Islands, the Commonwealth of Northern Mariana Islands, Guam, and American Samoa	All institutions applying for federal grants are required to provide a DUNS (Data universal numbering system) number.
	Small Business Technology Transfer (STTR)		Each agency provides up to $6,500 of SBIR/STTR funds for the technical and business assistance	Small businesses	All	Nation-wide	Small businesses that are majority-owned by multiple venture operating companies, hedge funds or private equity firms A majority (more than 50%) of firms' equity (e.g., stock) must be directly owned and controlled by one of the following: 1) One or more individuals who are citizens or permanent resident aliens of the US, 2) Other for-profit small business concerns (each of which is directly owned and controlled by individuals who are citizens or permanent resident aliens of the US). 3) A combination of (1) and (2) above.
	The Small Business Innovation Research (SBIR) programme	Each year, Federal agencies with extramural research and development (R&D) budgets that exceed $100 million are required to allocate 3.2% (since FY2017) of their extramural R&D budget to fund small businesses through the SBIR program.	Each agency provides up to $6,500 of SBIR/STTR funds for the technical and business assistance	Small businesses	All	Nation-wide	• Organized for profit, with a place of business located in the United States; • More than 50% owned and controlled by one or more individuals who are citizens or permanent resident aliens of the United States, or by other small business concerns that are each more than 50% owned and controlled by one or more individuals who are citizens or permanent resident aliens of the United States; • No more than 500 employees

UK	Manufacturing Advisory Services (MAS)		Maximum funding available of £10,000	SMEs	Manufacturing	England and Scotland	MAS offered funded support to SME manufacturers in England. An SME is a business with the following characteristics • Less than 250 employees • Turnover less than €50m or a Balance Sheet total of less than €43m • Not part of a group which in itself exceeds one of the criteria above
	Business Basics Programme	£9.2m over 4 years agreed in the Autumn 2017 budget	Not specified	SMEs	Not specified	Nation-wide	MAS offered funded support to SME manufacturers in England. An SME is a business with the following characteristics (defined by the EU). • Less than 250 employees. • Turnover less than €50m or a Balance Sheet total of less than €43m. • Not part of a group which in itself exceeds one of the criteria above.
	Catapult Network		Not specified	SMES	Multiple industry sector	The network is comprised of nine catapults with a national presence spanning over 40 locations across the UK	Not specified
	Nationwide innovation voucher scheme	~ £4 Million	Not specified	SMEs	Multiple industry sector	Birmingham Solihull Redditch Bromsgrove Wyre Forest (Kidderminster)	Firm located in the UK and to be a start-up, micro (<10 employees), small (10-49 employees), or medium-sized (50-249 employees) business. The applicant should require help from a specialist to execute a specific innovation project or meet a certain business challenge. Firms were only eligible for the innovation voucher if they had not worked with the chosen external partner before the program. Finally, applicants were not considered if they had previously received an innovation voucher from InnovateUK. **Priority sectors** Advanced manufacturing (including automotive & aerospace) low carbon ICT

							digital & creative life science
New Zealand	The Growth Services Range (GSR): which consists of the Growth Services Fund (GSF), Market Development Services (MkDS) and Client Management Services (CMS)		GSF: funding is available for up to 50% of the costs of approved projects and is typically up to $100,000 per company within any 3-year period	Not specified	All	National-wide	• The GSF grant is only available to firms with high growth potential (average 20% per annum revenue growth sustainable for five years, or revenue growth of $5m within five years) • All client firms receive the specialist CMS advisory services. • MkDS services are available to all firms that are deemed capable and willing to pay for the services.
	Provincial Growth Fund (PGF)	3 billion dollars over a three-year term	Not specified	All	Priority and/or high value sector: manufacturing and engineering, energy, food and beverage, aquaculture, forestry and wood processing and tourism	Regional New Zealand	Applications were open to all individuals, non-government organisations, iwi, and charities as well as New Zealand companies, including those that are foreign-owned for investment into the New Zealand economy.
	The Regional Growth Programme (RGP)	Not specified	Not specified	Not specified	All	Regional New Zealand: regions with economics issues such as low economic growth or low household incomes, with pockets of high deprivation and unemployment: Northland, Bay of Plenty (BOP), East Coast/Gisborne, Hawkes Bay, Manawatū/Whanganui, the West Coast, Waikato, Taranaki, Canterbury, and Southland	Not specified
	The Primary Growth Partnership (PGP)	**PGP funding:** $13 million **Industry funding:** $13 million	Not specified		PGP: Primary industries	National-wide	Not specified

	and the Shellfish Production & Technology (SPATnz)				SPATnz: Seafood		
	Incubator Support Programme	In 2011/12 government support to business incubators was $4.4 million in funding to eight incubators, plus $0.4m for NZTE's Incubator Development Unit (IDU) and $0.1m miscellaneous grants.	Not specified	Start-up businesses	All	Nation-wide	Start-up businesses with high-growth potential
Singapore	The Capability Development Grant (CDG) scheme			SMEs	All	National-wide	To be eligible: • Registered and operating in Singapore • At least 30% local shareholding • Group annual sales turnover ≤ S$100m or group employment of ≤200 employees
	Enterprise Singapore's (ESG) loan Schemes		Up to $100K financing	SMEs	All	National-wide	Business registered and operating in Singapore, with at least 30% local shareholdings. Annual revenue not more than S$1 million or have up to 10 employees.
	Isprint Scheme		Funding per SME capped at S$20 000 for business improvement	SMEs	All	National- wide	Local SMEs with at least 30% local shareholdings, not more than S$100 of group annual sales turnover million or have up to 10 employees.
	Industry Transformation Programme (ITP)	Not specified	Not specified	Lifestyle sectors (i.e. Food Services, Retail, Hotel, MICE,	The program covers 23 different sectors (through sector-specific	Nation-wide	All companies from the lifestyle sectors that are legally registered or incorporated in Singapore, with a Unique Entity Number (UEN) registered with ACRA are eligible to apply.

				Attractions, Tour & Travel)	transformation maps)		
Scandinavian	The Swedish Competence Centres programme	Each Centre has had an annual budget of around 18 MSEK		Not specified	Not specified	National-wide	Competence centres (CC): the centres are typically located on a university campus and involve a consortium of companies working together with people from more than one academic department in doing R&D
	Regional Venture Capital Funds	Not specified	Not specified	SMEs	All	12 fund projects (10 venture capital funds)	SMEs that are in the seed, start-up or expansion stages.
	Innovation Fund Denmark (IFD) including four largest programmes: Grand Solutions, InnoBooster, InnoFounder and Industrial Researcher		In 2018, IFD will invest DKK 1.4 billion in new projects.	Varies according to the four different programs: e.g., InnoBooster is targeted at SMEs; InnoFounder is for new graduates	All	Nation-wide	Not specified
	The Danish Growth Fund (DGF)		Loans amounting to less than EUR 1 million	Entrepreneurs and SMEs	All	National-wide	Entrepreneurs, small and medium-sized enterprises (SMEs) of high growth potential, which lack sufficient collateral and/or the track record to obtain a bank loan on normal market terms.
	Norwegian Innovation Clusters (NIC)	Not specified	Not specified	Not specified	All	National-wide	There are no restrictions on who can apply for admission to the cluster program. However, applicants for all levels (see the detailed description below) must meet a set of requirements for how the cluster project is organised, e.g. a legal entity as the formal applicant, a defined partnership between actors in the cluster, a board representing the partnership and an operational management. The project proposal must be in accordance with the purpose of the program and the specific call for proposals. Furthermore, it should be the result of a joint process with the participation of key actors in the partnership.

Germany	Central SME Innovation Programme (ZIM)	Not specified	Not specified	SMEs	All	Germany. Since 2018, ZIM is open to international cooperation networks in order to enable SMEs to better position themselves and network at global level and to tap new markets.	
	EXIST		150,000 Euro	Start-ups	All	Germany & Israel	Not limited to a particular industry or technology field. SMEs and medium-sized companies with less than 500 employees and an annual turnover of less than €50m and based in Germany are supported by the program.
	Fraunhofer Institute (Germany) (FhG)	Not specified	Not specified	Not specified	All	Nation-wide	Scientists from public, non-profit -> research institutes -> universities o University graduates and former academic staff members (up to five years after getting a degree or dropping out). o Students who have completed at least half of their studies at the time of applying. o Entrepreneur Teams of up to three people. Teams that are made up of a majority of students are only funded in exceptional cases. o One of the maximum of three team members may have a qualifying professional education and can be funded as the technical staff or one of the team members may have a degree that is more than five years old.
	German Corporation for International Cooperation (GIZ)	None	Not specified	None	All	Nation-wide	The organization's fields of research focus on people's needs: health, security, communication, mobility, energy, and the environment. – Information and Communication Technology – Innovation Research – INNOVATION – Life Sciences – Light & Surfaces – Materials and Components – MATERIALS – Microelectronics – Production
South Korea	Korea Institute of Startup and Entrepreneurship	over KRW100 billion for the complete program	Not specified	Start-ups	Technology	Nation-wide	None

	Development (KISED)						
	TIPS (Accelerator Investment-Driven Tech Incubator Programme for Startup)	Not specified	Not specified	Start-ups	Technology	Nation-wide	KISED is actively supporting technologically innovative start-ups in a wide range of areas from start-up education, commercialization to marketing
	K-startup grand challenge	Not specified	Not specified	Start-ups	Not specified	Nation-wide	It is specific to tech-based start-ups. Start-ups under three years old are eligible to apply for the program led by the Ministry of SMEs and Start-ups. Each selected team is eligible to receive up to 1 billion won ($838,000) in funding, used as seed capital, research and development expenses or marketing fees.
	Startup Voucher Programme	~17 billion KRW funding per year from government	Not specified	Start-ups	Not specified	Nation-wide	To apply for 2021 grand challenge, start-ups must be less than seven years old, and their representative must be of foreign nationality. They must also demonstrate a clear interest in expanding into the Korean and East Asian markets.
Israel	The Pilots Programme	20%-50% of the approved R&D expenditure	Not specified	ALL	Specific industry	Nation-wide	Domestic enterprises with no history of export activities
	MAGNET Consortiums	None from participant	Not specified	All	Technology related	Nation-wide	Not specified
	Bi-National Funds Programme: •India-Israel Industrial R&D and Technological Innovation Fund (I4F) – Israel-India •Israel-U.S. Binational Industrial	Maximum $2 million USD	Not specified	All	Specific industry depending on the country of the program	Nation-wide	• Israeli companies developing competitive products that are interested in developing innovative technologies which can be used as a basis to develop a new and advanced generation of products. •Israeli academic research groups engaged in scientific or technological research, seeking to promote applied research as part of a consortium, to collaborate with the industry, and to study the market needs.

	Research and Development (BIRD) – Israel-United States •Singapore Israel Industrial R&D Foundation (SIIRD) – Israel-Singapore •Korea- Israel Industrial R&D Foundation (KORIL) – Israel-Korea						
	The Workshop programme	None from the participant	Not specified	Individual	Technology	Nation-wide	Israeli technology companies from all industrial sectors that seek to develop or upgrade products and technologies with an international partner in the US, India, Singapore, and Korea. Calls for proposals are published from time to time and provide priority to specific technological fields. • I4F Specific sector: Water, Healthcare, Agriculture, Energy, ICT • BIRD Sector: Agriculture, Communications, Construction Technologies, Electronics, Electro-optics, Life Sciences, Software, Homeland Security, Renewable and Alternative Energy and other technology sectors • SIIRD: R&D based technology project •KORIL: All technology sectors are welcome
Japan	Organization for Small & Medium Enterprises and Regional Innovation, JAPAN (SME Support, JAPAN）	Capital: 1.1 trillion yen from government	Not specified	SMEs	All	Nation-wide	existing developers and engineers aiming to become AI specialist. The program supports the creation of a joint framework for a group of high-tech companies that will provide their employees with advanced training while working in the industry.
	J-startup	Not provided	Not specified	All	Technology	Nation-wide	Small and Medium enterprises (SMEs) are selected based on the capital and number of employee size. • Manufacturing and Others: 300 million yen or

							less, 300 or less • Wholesale: 100 million yen or less, 100 or less Retail: 50 million yen or less, 50 or less • Service: 50 million yen or less, 100 or less
	Impulsing Paradigm Change through Disruptive Technologies (ImPACT) programme	Capital: 55-billion-yen government funding for the program	Not specified	Not specified	Research	Nation-wide	Deep tech, platform and SDG-oriented startups
	Small Business Innovation Programme (SBIR)	Not provided	Not specified	SME	Technology	Nation-wide	select a cast of researchers that provides optimum R&D capability, and will lead high-risk, high-impact R&D aimed at achieving disruptive innovation
OECD/NESTA/WEF	Training Programme to Encourage Social Entrepreneurship	The program cost of approximately 12,000 euros	Not specified	Entrepreneurs		France	Applicants have to be SMEs or individuals who are capable of conducting R&D and of developing new technology to start new businesses
	InnoCAP: Increasing the innovation capacity of SMEs	EU contribution: € 500 000	Not specified	SMES	All	Austria	The participants are SMEs that successfully applied to one of Austrian research promotion agency- FFG's innovation funding schemes
	DCS-iSMEs: Design Customised Support for Innovative SMEs	EU contribution: € 60 000	Not specified	SMEs	All	Greece	Not specified
	Create4value: Creative collaboration to provide value for first time innovators -	EU contribution: €60,000	Not specified	SMEs	All	Poland - West-central	SMEs that have never before benefited from any type of innovation support.

	effective engagement of stakeholders and users in co-creation processes in SMEs						
	DINNOS: Diversity Innovation Support Scheme for SMEs	EU contribution: € 696 215	Not specified	SMEs	All	West Midlands Region of the UK and the Rhine-Ruhr Region of Germany.	SMEs in the West Midlands Region of the UK and the Rhine-Ruhr Region of Germany.
	InReady	Budget of €60,000	Not specified	Start-ups	Not specified	Lithuania, Greece, Italy	
	HeadsUp!	The funding is part of the government's £8m Business Basics Programme, unveiled in the Industrial Strategy, run by the Department of Business, Energy and Industrial Strategy (BEIS) and Innovate UK.	Not specified	Small businesses	Not specified	4 main areas: London, Birmingham, Oxfordshire and Lancashire business	start-ups dealing with investors
	Local Productivity Club NOTE: This program is basically an output of Business Basic Programme of UK.	Budget of £60,000	Not specified	SMEs	Manufacturing or service	UK	4 main areas: London, Birmingham, Oxfordshire and Lancashire business must not have received more than €199,000 of De Minimis State Aid in the last three (3) financial years. Additional criteria: The business has no more than 9 employees; and The business has its registered offices London, Oxfordshire, Lancashire or Birmingham,
	Artificial Intelligence in London's	Budget of £249,678	Not specified	SMEs	All	UK	SMEs classified as a manufacturer or service company are eligible provided you comply with the EU requirements that define a SME (normally less than 250 employees with a turnover of less than €50m).

	hospitality and retail SME sector						There is a de-minimis in terms of government and EU support your business received over a 3-year period. This is currently the equivalent of €200,000 maximum. The business needs to have an operating facility in the borough of King's Lynn and West Norfolk.
	People Skills+: An innovative management and leadership approach to boosting SME productivity ## This project is inactive now.	Budget of £339,320	Not specified	SMEs	Human resource	UK	None
	Global Business Innovation Programme (GBIP)	Not specified	Not specified	All	Innovative businesses	UK	None
	The Scale-up Programme	Budget of ~£39m	Not specified	SMEs	All	UK	Not Specified
	Business Training Programme	Not specified	Not specified	Not specified	Not specified	South Africa	Companies achieving, or with the potential for, 50% compound annual growth rates (CAGR) and over. The most outstanding scaling businesses that are disrupting their industries, capable of internationalisation
Mexico	Capacity Building Support Programme		Not specified		Finance	Rural Mexico	This program provides grants for capacity building projects to financial intermediaries with the goal of getting them ready to receive FND loans and more broadly to develop sound rural financial institutions that can responsibly reach more rural borrowers.