



Grant Thornton

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Digital Hub Review

Department of Communications, Climate Action & Environment

30 June 2020



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Acronyms

CSO	Central Statistics Office
DCCAE	Department of Communications, Climate Action & Environment
DCC	Dublin City Council
DESI	Digital Economy and Society Index
DETE	Department of Enterprise, Trade & Employment
DHDA	Digital Hub Development Agency
DLR	Dún Laoghaire–Rathdown
DMDL	Digital Media Development Limited
DPER	Department of Public Expenditure & Reform
EI	Enterprise Ireland
FT	Full Time
LDA	Land Development Agency
LEO	Local Enterprise Office
NCAD	National College of Art & Design
NDRC	National Digital Research Centre
NDS	National Digital Strategy
PSC	Public Spending Code
PV	Present Value
SFI	Science Foundation Ireland
SMEs	Small & Medium Sized Enterprises

Definitions

A business **accelerator** is a programme that gives developing companies access to mentorship, investors and other support that help them become stable, self-sufficient and sustainable businesses. Companies that use business accelerators are typically start-ups that have moved beyond the earliest stages of getting established.

Community coworking space is office space made available in a collaborative community setting. Community coworking spaces generally have a mixture of office sizes and meeting rooms, a common area for kitchen and soft seating open area meeting spaces for their members.

Coworking is an arrangement whereby several workers from different companies share an office space. Coworking office space is usually open plan communal offices with shared meeting rooms allowing collaboration with different organisations with complimentary skill sets.

A **digital tech cluster** is a critical mass of digital technology businesses within an urban location which interact with one another. Such interaction can be formal, such as through trading or forming partnerships, as well as informal, such as through networking and socialising.

A business **incubator** is an entity that helps startup companies to develop by providing services such as management training or office space.

Serviced offices provide centrally managed, fully-fitted and furnished flexible office space on a licence agreement. In addition to individual offices, serviced offices can include co-working spaces.

A **startup** is a company with a minimum viable product, working towards establishing a repeatable and scalable business model.

A **tech hub** is a physical space with a high density of technology companies present. A tech hub can exist as a city, a suburb or just a suite of offices.

Executive Summary



Executive Summary

This strategic review report has been commissioned by the Department of Communications, Climate Action & Environment (DCCA) to inform an assessment of the current rationale for the Digital Hub Development Agency (DHDA) (**Phase 1**) and to review the effectiveness, efficiency and value for money of the agency through the conduct of a Cost Benefit Analysis (CBA) (**Phase 2**). One of the key justifications for this review has been the fact of the significant growth and development of the digital economy and digital ecosystem in Ireland since the initial establishment of the DHDA in 2003. A fundamental rationale for the Digital Hub Project was that of enhancing Ireland's capacity in digitally-intensive information and communication technologies. In light of advancements in the Irish digital economy the question has arisen as to whether there is currently a market failure to be addressed by the DHDA. As a result, this analysis aims to answer the following questions:

- Is the DHDA required in order to meet a socio economic need?
- Are the original rationale and functions of the DHDA as provided in statute still valid having regard to developments in the market?
- What is the DHDA's relationship to the rest of the digital ecosystem, including consideration of the range of public and private supports for that ecosystem?
- What is the social and economic value added by the DHDA?

The market gap analysis (**Phase 1**) has been undertaken to assess and define the nature of any market failure that may be currently addressed by the DHDA. **The findings of the market gap analysis are that the DHDA is not required in order to sustain the continued growth and development of the Irish digital tech sector.** The Irish digital tech sector is incredibly dynamic and advanced, and Ireland is one of the most innovative and knowledge intensive economies in the world. Ireland's strong performance in technological innovation is also not purely attributable to the presence of global tech multinationals, as Ireland's indigenous SMEs are ranked best in the EU for innovation activities. Based upon the empirical data to hand there is no evidence to suggest that the knowledge intensity of the Irish economy is sustained by the services provided by the DHDA.

As Ireland's digital economy has evolved, so too has the range of public and private supports designed to support the digital ecosystem. These include an extensive and steadily increasing array of enterprise centres and coworking office space service providers that have come into operation across Dublin.

While the expansion of Dublin's flexible coworking office space has made the tech sector less reliant upon the Digital Hub, the DHDA remains among the largest providers of such services in Dublin. The Digital Hub's location in Dublin 8 has come to serve as a counterbalance to the overconcentration of Dublin's coworking office space market in the Docklands and in Dublin 2 in particular. This trend of increased concentration of tech sector activity within the Docklands area may be set to intensify over coming years in light of plans for the development of a Grand Canal Innovation District. The fact that the Digital Hub is a major service provider that is in public ownership means that it provides a stabilisation function within the Dublin coworking office market. **The presence of the Digital Hub remains important to the ongoing regeneration of the Liberties,** which continues to be one of the most economically disadvantaged areas of Dublin.

In light of these considerations and the findings of the market gap analysis all of the options within this analysis have sought to relieve the Exchequer of the requirement to subvent the continued operation and development of the Digital Hub. The CBA component of this review (**Phase 2**) has **evaluated a range of options for the future of the DHDA, all of which either dissolve the DHDA or remove the requirement for Exchequer funding of the Digital Hub.**

In the event that the DHDA is dissolved, it is assumed that all of the Digital Hub's clientele will be gradually displaced to other flexible coworking office facilities across Dublin. This outcome is assumed to have no material impact on the long-term growth and development of the Irish digital tech sector.

In the event that the DHDA is retained, the achievement of commerciality is taken to be necessary. In light of the goal of achieving sustainable commerciality this analysis also includes an examination of the budgetary implications of each option considered in terms of DHDA reliance upon Exchequer funding.

The ultimate findings of the market gap analysis were that the Irish digital tech sector and Dublin coworking office space market are exceptionally robust



Approach

This review has been undertaken in accordance with the prescribed guidance provided within the Public Spending Code (PSC). The methodological approach taken has consisted of the following three core elements:

- Stakeholder Engagement Process
- Market Gap Analysis
- Cost Benefit Analysis (CBA)

A total of 47 consultations were held with key stakeholders covering a broad range of Digital Hub related expertise, interests and experience. These included representatives of:

- Digital Hub client companies
- Membership of the DHDA Board
- Local community groups
- Central Government Departments
- Government Agencies
- Local Government
- Management of other enterprise coworking hubs
- Academic experts
- Health sector experts

A total of 21 consultations were held with DHDA client companies, representing an exceptionally high response rate of 80.7%. These included both current and former DHDA clientele. In the interest of efficiency all consultations with DHDA client companies were held via teleconference. The vast majority of the remaining consultations were held face-to-face. As with the consultations held with DHDA client companies, the response rate for the remaining stakeholders engaged was exceptionally high. This stakeholder consultation process proved invaluable in gaining a wide range of views and opinion on the DHDA and the Digital Hub.

In terms of the market gap analysis undertaken as a component of this review, a wide ranging suite of data was collected and analysed in order to address the question of whether the DHDA is currently required in order to meet a socio-economic need. In particular, the market gap analysis sought to answer the question of whether the original rationale and functions of the DHDA are still valid.

Another key consideration within the market gap analysis was that of whether the DHDA is required in order to provide adequate flexible coworking office space capacity in Dublin. In the absence of readily available of secondary data on the Dublin coworking office space market Grant Thornton sub-contracted market research services from Lisney, who are the leading estate agents in the Dublin area with particular expertise on coworking office space. Lisney provided Grant Thornton with comprehensive survey data on the Dublin working office space market, including information on the balance of market share among Dublin flexible office space service providers, total coworking office space capacity and pricing, inclusive of variation on these variables across Dublin's various districts. Other data utilised within the market gap analysis was sourced from a range of secondary sources including:

- DHDA
- DCCAE
- DETE
- Dublin Local Enterprise Office (LEO)
- Tech Ireland

In order to address the market gap issue, the analysis consisted of the development of a comprehensive profile of the Irish digital tech sector and the Dublin coworking office market. All variables and metrics examined considered the question of whether the DHDA is required in order to sustain the growth and development of the Irish digital tech sector.

The ultimate findings of the market gap analysis were that the Irish digital tech sector and coworking office space markets are exceptionally robust and are not reliant upon the services provided by the DHDA. However, the market gap analysis evidenced the fact that structural imbalances have emerged within Dublin's flexible coworking office space market. In particular, Dublin's coworking office market is at risk of becoming overly concentrated within Dublin 2. Dublin's cost competitiveness as compared to other major international tech hubs is also a genuine concern. In light of these market developments the Digital Hub has come to serve as a counterbalance to Dublin's Docklands. The Digital Hub has come to represent a coworking office space option in Dublin 8 that is central, flexible and affordable.



Economic Evaluation

At the outset of this project seven distinct potential options for the future of the DHDA were considered. In light of the findings of the market gap analysis a shortlist of four options were brought forward to full evaluation in a CBA, all of which resulted either in the dissolution of the DHDA or the retention of the Digital Hub on a commercially sustainable basis. This shortlist of options was as follows:

- Counterfactual
- Retain DHDA but divest a share of assets to the Land Development Agency (LDA)
- Retain DHDA, divest a share of assets to the LDA and designate facilities for a new sub-sectoral cluster
- Dissolve the DHDA and transfer all assets to other organ(s) of the State

The **counterfactual**, or 'do minimum', scenario involved the retention of the DHDA and the creation of new office space through the redevelopment of the VAT House 7 site. This scenario would see the development of new office space through the leveraging of a portion of the DHDA's properties, plus DHDA borrowings and Exchequer investment. In this scenario, some of the properties in the Digital Hub's portfolio are exchanged in return for in-kind refurbishment of unused properties or new-build offices in partnership with private sector operators. Under the counterfactual scenario the total floorspace of the Digital Hub increases from 91,225 ft² today to reach 133,225 ft² by virtue of the provision of an additional 42,000 ft² of office space within the VAT House 7 building.

Option 2 would see the retention of the DHDA and the divestment of a share of the DHDA's property portfolio to the LDA. Under this scenario the Digital Hub campus will be substantially redeveloped and consolidated within a share of its existing campus footprint. As with option 1, this scenario would see the redevelopment of existing coworking office space along with the development of new space by divesting some of the DHDA's properties. As distinct from option 1, the process of divesting a share of the DHDA's assets under option 2 is achieved through a strategic partnership with the LDA. This distinction has implications in terms of the scheduling, scale and nature of any future Digital Hub campus redevelopment, as the LDA has financing capabilities which would reduce the DHDA's reliance upon its own financial resources or Exchequer funding. Scenarios where the LDA plays a significant role (option 2, 3 and 4) are dependent upon the LDA having access to the requisite levels of financing.

Under option 2 sites that are currently within the Digital Hub portfolio are redeveloped by the LDA for a range of purposes including the Digital Hub's future requirement, social and affordable housing, community amenities, commercial office space and retail space. The final scale of the redeveloped Digital Hub campus under option 2 is 150,000 ft², resulting in the delivery of an additional 58,775 ft² of office space as compared to the current scale of operations. This scale of development represents the upper limit of what is expected to be achievable on a market basis through the strategic partnership with the LDA, i.e. without the requirement for external funding for any potential campus redevelopment. The ultimate space delivered in such a scenario would depend upon a number of factors including the outcome of any commercial discussions between the LDA and DHDA, as well as the business case for any such campus redevelopment masterplan.

As with option 2, **option 3** involves the retention of the DHDA and the divestment of a share of the DHDA's property assets to the LDA. However, as distinct from option 2 this option involves the creation of a new sub-sectoral cluster within the Liberties. During the stakeholder consultation process undertaken for this review several industry stakeholders expressed a preference for the establishment of an e-health cluster in Dublin with sector-specific industry supports and managerial expertise above and beyond the basic provision of flexible coworking office space.

The Liberties has advantages as a location for the establishment of an e-health cluster, including the close proximity of multiple major institutions engaged in health practice and health research, as well several institutions engaged in communications technology research and design.

The establishment of an e-health cluster could be achieved *within* the Digital Hub or *in parallel* to the Digital Hub campus. The establishment an e-health cluster as a stand-alone entity at a dedicated facility, i.e. *in-parallel* to the Digital Hub, would allow for the provision of sector-specific technical and managerial expertise as well as sector-specific infrastructure and facilities. This analysis does not specify what the governance structure, precise function or remit of such an e-health cluster might be. Such a facility is modelled as being 15,000 ft² in scale and as being additional to the 150,000 ft² of office space provided under option 2.



Option 4 would see the dissolution of the DHDA and the transfer of essentially all of the 5.6 acres of land assets within the DHDA’s portfolio to the LDA to be redeveloped as a mix of social housing, affordable housing and commercial property. The principal justification for consideration of this option is that the continued growth and development of the digital sector in Ireland is not currently reliant upon the services provided by the DHDA. While the market gap analysis has found that there is currently no requirement for the DHDA to fill a market gap as far as the tech sector writ-large is concerned, the same may not be true for the e-health cluster envisaged under option 3. As a result, option 4 retains the designation of 15,000 ft² of office facilities for the establishment of this e-health sub-sectoral cluster. Option 4 does not require that the e-health cluster be established by the DHDA or that the e-health cluster represents any form of continuity with the Digital Hub in any sense. Neither does the quantitative appraisal take account of the overarching governance model associated with any such e-health cluster.

In terms of the specific **benefits** that are expected to arise under each of the options considered in the analysis, these include:

- Commercial Income
- Clustering effect Gross Value Added (GVA)
- Residual values of properties

The costs and benefits associated with the redevelopment of assets by the LDA are taken to be external to this analysis. These benefits include the provision of social and affordable housing, the development of commercial and office buildings and considerable progress in the broader regeneration of the Liberties.

For the purposes of this CBA, property development costs, operational expenditure and commercial income levels are projected to differ across each of the options considered in proportion to the quantum of office floorspace provided. Approximately a third of the benefits accrued under each option considered stem from office rental commercial income. In terms of the benefits associated with the Digital Hub’s industrial clustering effects, the analysis utilises the findings of Enrico Moretti’s (2019) study to quantify the GVA uplift of firms based within the Digital Hub. Taking the CSO’s annual ICT services sector GVA per employee data as a baseline, the analysis applies the estimated elasticity of productivity with respect to cluster size to quantify the aggregate effects of geographical agglomeration on total GVA for the cohort of companies based in the Digital Hub.

Economic Evaluation Results

After the application of the recommended discount rate of 4%, as provided by the Department of Public Expenditure and Reform (DPER), all of the options considered return positive NPVs. The highest Net Present Value (NPV) result is recorded for option 3. This result is due to the fact of higher commercial income and a larger scale clustering effect for option 3. Options 2 and 3 have comparably higher NPVs because these two options result in the creation of the largest industrial clusters and the largest lettable floorspace areas. Option 3 results in the highest levels of commercial income among all of the options considered due to the fact that this option has the largest lettable floorspace. This is due to the establishment of an e-health cluster under option 3, which is taken to be additional to the floorspace of the Digital Hub under option 2.

#	Option	Total Floorspace	Lettable Floorspace	NPV	BCR
1	Counterfactual	133,225 ft ²	112,048 ft ²	€107,839,662	2.022
2	Retain DHDA and divest a share of assets to the LDA	150,000 ft ²	126,156 ft ²	€133,524,186	2.263
3	Retain the DHDA, divest a share of assets to the LDA and designate facilities for a new sub-sectoral cluster	165,000 ft ²	138,772 ft ²	€154,013,553	2.346
4	Dissolve the DHDA and transfer its assets to other organ of the State	15,000 ft ²	12,616 ft ²	€2,482,468	1.197



All options considered return positive NPV and BCR values within the quantitative economic appraisal. However, the higher periodic maintenance costs, costs associated with unoccupied properties and lower commercial income levels under the counterfactual scenario result in lower NPV and BCR results.

Option 4 results in lower NPV and BCR results. However, option 4 does have the potential to provide a greater contribution in addressing other market structural imbalances and societal needs beyond the tech sector. As distinct from options 2 and 3, option 4 is assumed to result in essentially all of the DHDA’s assets transferring to other organs of the State. As a result, option 4 would be likely to result in the sites currently occupied by the Digital Hub being repurposed for other societal needs, such as the delivery of social and affordable housing. **The vast majority of the costs and benefits that result from option 4 are necessarily taken to be external to the scope of this analysis.** This fact explains the comparatively poor performance of option 4 in the economic evaluation component of this review. While option 4 results in the dissolution of the DHDA and the transfer of all of its assets to other organs of the State, this option retains the establishment of an e-health cluster within the Liberties in light of the fact that several industry stakeholders expressed a preference for such an e-health cluster. This analysis does not specify what the governance structure, function or remit of such an e-health cluster might be under either options 3 or 4.

This analysis was undertaken in advance of the onset of the Covid-19 pandemic. As a result, the commercial income projections within the analysis do not take account of the potentially negative impacts that Covid-19 may have upon the flexible coworking office market in Dublin. The Covid-19 pandemic is likely to depress the DHDA’s commercial income in the medium-term. The Covid-19 pandemic may also have longer lasting negative impacts upon the coworking office space business model more generally, as companies may become more averse to coworking environments while also becoming more accustomed to remote working models.

Multi-Criteria Analysis

In addition to conducting a quantitative economic appraisal of the options considered this analysis also included a Multi-Criteria Analysis (MCA). The purpose of the MCA is to consider non-quantifiable, i.e. qualitative, factors in a formalised manner through weighted average scoring against a set of pre-defined critical success factors.

The MCA evaluates the options considered under 4 overarching evaluation headings:

- Strategic Policy Alignment
- Optimal Use of Location
- Impact Upon the Local Community
- Technical & Planning Issues

The MCA exercise was conducted through a structured survey of the members of the Steering Group overseeing the project. The Steering Group was established by DCCAE to oversee the completion of the review. It had membership from the DCCAE; the Department of Public Expenditure and Reform (DPER); the Department of Enterprise, Trade & Employment (DETE); the DHDA; Enterprise Ireland and Grangegorman Development Agency (GDA). The final scoring results were derived using a weighted sum model using pre-defined weightings. Option 3 returned an overall MCA score of 76.2 out of a potential score of 100. Option 2 had the second highest overall MCA result at 59.1, while options 1 and 4 return comparable scores of 44.6 and 49.1 respectively.

Conclusions

This review has been undertaken to evaluate the current rationale, effectiveness, efficiency and value for money of the DHDA. This has included both a comprehensive market gap analysis and an evaluation of a range of options for the future direction of the DHDA. The findings of the market gap analysis were that there is no evidence to suggest that the continued growth of the Irish digital economy is sustained by the services provided by the DHDA. For these reasons, all of the options considered either dissolve the DHDA or remove the requirement for Exchequer funding of the Digital Hub. This review has found that option 3 has scored the most favourably on the economic evaluation criteria examined. Option 3 provides the highest stream of benefits over the time horizon of the analysis as well as a better ratio of costs to benefits. The prospect of establishing an e-health cluster within the Liberties is a proposition which requires additional consideration and further exploration. In addition, all scenarios involving the LDA (option 2, 3 and 4) are also subject to the LDA gaining access to the requisite levels of financing. Option 4 performs less favourably in the quantitative appraisal as a result of the fact that more costs and benefits are taken to be external to the analysis under this option. However, option 4 does have the potential to provide a greater contribution in addressing other market structural imbalances and societal needs beyond the tech sector.



Background

Background

Approx. 40% of the clients based at the Digital Hub in recent years have been foreign companies



The role of clusters in Irish economic development

The establishment of the Digital Hub emerged in line with Irish enterprise policy in the early 2000s which sought to encourage agglomeration economies based on industrial clusters to guide industrial development and improve productivity. Irish policymakers adoption of the cluster concept dates back to 1992 and the publication of the *Culliton Report*, which recommended the promotion of industrial clusters focused on niche industrial sectors. The findings of the *Culliton Report* were based on Michael Porter's book, *The Competitive Advantage of Nations*, where the concept of a cluster is defined as:

“Critical masses, in one place, of unusual competitive success in particular fields...Clusters are geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities.”

(Porter, 1990)

According to Porter, where strong clusters exist, they enhance productivity. However, four conditions must be met in order for a cluster effect to occur which results in enhanced productivity:

Proximity: Firms must be close enough geographically to allow for positive spillovers to be enjoyed and/or for resources to be shared.

Market Relationship: Firms must have a common goal (e.g. meeting the needs of the same market), or requiring highly skilled specialised labour in a specific field to benefit from interaction.

Active Interaction: Active relationships must be developed for positive cluster effects to emerge.

Critical Mass: A sufficient number of participants must engage in active interactions before any meaningful or significant impact on company performance results. The number depends on the particular cluster, its location and its target market.

The productivity improvements that arise from industrial clustering initiatives are summarised in table 2.1.

Table 2.1: The effects of industrial clustering

Agglomeration effects	Enhance production processes Diffuse technology within the cluster Promote expansion of existing firms Facilitate higher innovativeness Improve FDI incentives Facilitate private infrastructure projects Promote innovation and new technologies
Community effects	Foster networks among people Establish networks among firms
Regional effects	Attract new firms and talent to the region Attract necessary talent to the region
Institutional supports	Provide technical training Provide mentoring and advice Provide management training Provide incubator services Provide business assistance Assemble market intelligence
Commercial interactive effects	Promote formation of spin-offs Promote cluster exports Coordinate purchasing
Reputational effects	Create a brand for the region or country in a sector Improve firms' cluster awareness
Policy effects	Establish technical standards Improve regulatory policy Lobby for subsidies Lobby government for infrastructure Analyse technical trends
<i>Doyle & Fanning 2007</i>	

Over 200 companies have progressed through the Digital Hub since 2004



THE DIGITAL HUB

Background to the Digital Hub

In 1999, the Irish Government, in addition to granting approval to develop MediaLabEurope, announced its intention to create a digital media centre in Dublin 8 along with plans for the urban regeneration of the locality (“Digital Hub Project”). The rationale for the Digital Hub Project, along with that of MediaLabEurope, was to enhance Ireland’s capacity in information and communication technologies and to facilitate Ireland’s transformation into a knowledge economy. The Digital Hub Development Agency (DHDA) was set up in 2003 under the Digital Hub Development Agency Act 2003 to support digital entrepreneurship through the creation of a cluster of enterprises focused on digital content and technologies in the Liberties area of Dublin 8. This was subsequent to the initiative being overseen by Digital Media Development Limited (DMDL), a private limited company owned by the state. The newly formed DHDA was established as a statutory agency assuming the functions of DMDL.

The Digital Hub Development Agency Act defines “digital content” in broad terms to mean “content stored - (a) in a digital format, or (b) electronically in a format which is not digital, that can be created, manipulated and exchanged electronically.” The geographic area of the Digital Hub is defined in the DHDA Act. The DHDA property portfolio comprises a campus of circa 5.6 acres with a further 1.02 acres owned by the Office of Public Works (OPW). The DHDA’s property portfolio consists primarily of protected structures, including vacant and derelict buildings which must be maintained pending their redevelopment. The DHDA has 10 occupied buildings of which 9 are in use for the purpose of the cluster.

An initial investment was made by the Irish State in the Thomas Street area to provide accommodation for digital enterprises and related activities of the Hub. Since this investment, over 375 digital companies have progressed through the enterprise cluster, and in doing so have supported over 2,000 jobs during their time at the Digital Hub. Approx. 40% of the clients based at the Digital Hub in recent years have been foreign companies. In terms of financing, the DHDA meets its operating costs through a combination of commercial income and Exchequer funding, with the agency seeking to fulfill its functions from commercial income and ultimately remove its reliance upon Exchequer funding.

The DHDA has received Exchequer funding averaging €1.6m per annum since 2003, amounting to a total of approximately €28.8m. This Exchequer contribution has been dedicated towards the maintenance of unoccupied buildings, operation of the agency’s Head Office, various digital initiatives and community liaison programmes.

In November 2011, as part of the Government’s plan for the rationalisation of State agencies, the DHDA was included in the list of agencies to be merged. In 2015 the Government decided that legislation be drafted to effect the merger by way of transferring DHDA to a company established by Dublin City Council.



The National Digital Research Centre

The Digital Hub is also home to the National Digital Research Centre (NDRC), which is based at the Digital Exchange. The NDRC is a Government funded initiative, aimed at converting late-stage technology research into commercial goods and services.

The NDRC is a pre-seed digital investor operating an accelerator model from its base in the Digital Exchange to transform solid ideas into commercially viable startups. It provides investment, an accelerator programme and working space to digital ventures.

The NDRC builds and invests in early stage digital startups, providing capital and hands on expertise to young Irish companies with international growth potential. It regularly features in the top 3 University Backed accelerators in Europe as judged by UBI Global.

NDRC’s mission is to deliver a sustainable supply of globally scalable Irish digital companies, helping to create high value jobs and prosperity.



There were approx. 700 people working at the Digital Hub campus at the end of 2019



The role of the Digital Hub Development Agency

The DHDA is tasked with the management of the Digital Hub cluster, which is aimed at creating an international centre of excellence for digital content and technology enterprises. This is achieved through offering digital companies flexible property solutions, facilities, and technology transfer with peer-to-peer collaboration within the wider digital sector.

DHDA's statutory functions include the requirement to:

- Develop the Digital Hub (including property development) as a location for digital enterprises and related activities
- Attract enterprises engaged in digital content to locate to the Digital Hub, thus creating a cluster in which companies would benefit from interaction with similar enterprises
- Engage with the local community including delivering educational projects particularly in digital arts and technology

The overarching objective for the DHDA is to be a catalyst for the development of an indigenous digital technologies sector in Ireland, generating jobs through the support of new and emerging companies, and building a critical mass of these activities in one location to facilitate the development of a cluster.

The DHDA is designed to combine the functions of enterprise support, learning, community and property management. The combination of these elements has been designed to provide a catalyst for the development of an indigenous Irish digital sector, establishing a cluster and community of knowledge workers and enterprises.

In pursuing its functions the objective of the DHDA is to foster an attractive working and living environment, both to ensure companies want to locate in the Digital Hub, their staff want to live local area and the local community benefits from the regeneration of their locality.

The DHDA also provides office space to the National Digital Research Centre (NDRC), whose activities complement the enterprise functions of the DHDA. The NDRC is a Government funded initiative, aimed at converting late-stage technology research into commercial goods and services.

Through location in the Digital Hub in Dublin indigenous companies can collaborate with one-another and with foreign-owned companies based in Ireland to further develop and stimulate Ireland's digital sector.

The Digital Hub has fostered innovation, technological development and creativity through the creation of a supportive, entrepreneurial environment in its campus in Dublin 8. Within the Digital Hub cluster, almost 80 companies operate in a broad range of digitally-intensive activities. There include digital media, advertising and marketing, business services, eLearning, fintech, gaming, healthcare and e-health, industrial organisation, telecommunications, software development and web design.

The ongoing regeneration of the Liberties

In addition to stimulating entrepreneurial and innovative activities in the region, the DHDA is devoted to the regeneration of the surrounding area of the Liberties, which has suffered from significant social and economic disadvantage.

The Liberties area is located in the southwest of Dublin's inner city and is home to one of Dublin's most historic neighbourhoods. The area is particularly noteworthy for its industrial heritage, exemplified by its proximity to the Guinness brewery, whiskey distilleries and historic textile industry facilities.

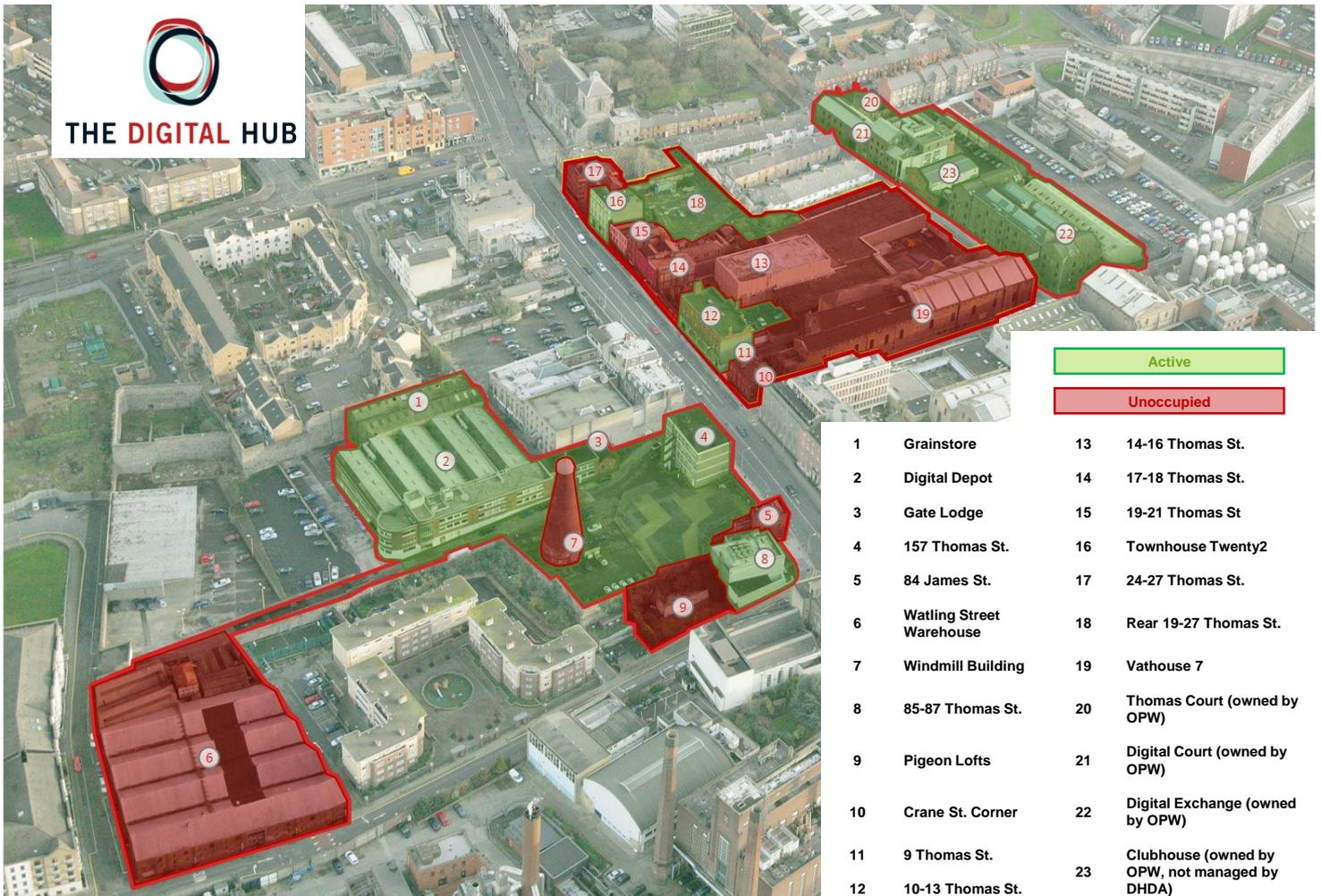
The DHDA is mandated to deliver a strategy for educational outreach and urban regeneration in the local community. It is important to note that Section 9(d) of the Digital Hub Development Agency Act makes clear reference to a strategy for educational provision, particularly for digital arts and technology, including linkages with first and second level schools.

In recent years, the Liberties area has begun to experience a rejuvenation through the emergence of the Innovation District, in no small part thanks to the Digital Hub. As a significant centre of activity and employment, the Digital Hub has contributed to the regeneration of the local area and runs numerous community education programmes for both adults and children.

The Digital Hub Campus

The Digital Hub's unique location in the historic Liberties area puts companies right in the heart of Dublin City.

Digital Hub Development Agency



Source: DHDA



Strategic Context

Strategic Context

Dublin is ranked 3rd overall in the Global Cities of the Future report



Introduction

The DHDA was established in order to enhance Ireland's capacity in information and communication technologies and to facilitate Ireland's transformation into a knowledge economy. The role of digital technology in daily life has evolved considerably since the initial establishment of the DHDA. As a result of the importance of digital technologies in many aspects of daily life there are multiple government institutional actors and strategic policy documents that aim to support Ireland's capacities in digital technology.

National Digital Strategy

In 2013 the Department of Communications launched Phase 1 of the National Digital Strategy (NDS) for Ireland focussing on Digital Engagement. The main focus of the NDS is on Doing more with Digital. It is a foundation step to help Ireland to reap the full rewards of a digitally enabled society. The Strategy sets out a vision and a number of practical actions and steps to encourage and assist more citizens and small businesses to get online. The ultimate goal of the NDS is the optimal economic and social use of the internet by business, individuals and by Government. Building on the 2013 National Digital Strategy Phase 1, the Government is now seeking to develop a new NDS to maximise the opportunities offered by digitalisation and respond to its challenges. A Public Consultation on a new NDS was launched in October 2018 inviting members of the public and interested stakeholders to make submissions. The progression of the NDS is a cross-departmental initiative encompassing:

- Department of the Taoiseach
- Department of Communications, Climate Action & Environment
- Department of Enterprise, Trade & Employment
- Department of Public Expenditure & Reform

Innovation 2020

Launched in 2015 by the Department of Business, Enterprise & Innovation (DBEI), Innovation 2020 is Ireland's current strategy for research and development, science and technology. The central vision in Innovation 2020 is for Ireland to become a Global Innovation Leader. The Innovation 2020 strategy is a whole-of-Government initiative that is led by the DBEI.

IDA Ireland Strategy

IDA Ireland is currently in the process of developing a new five year strategy to succeed its current strategy "Winning FDI 2015 – 2019". IDA-supported foreign direct investment into Ireland has been critical to the development of Ireland's digital tech sector.

Dublin Regional Enterprise Plan to 2020

Published by the DBEI, the Dublin Regional Enterprise Plan to 2020 includes practical actions and strategic objectives to support the digital ecosystem including

- Supporting sustainable and scalable start-ups
- Providing quality support to start-ups
- Conducting and publishing surveys across Dublin on coworking enterprise space
- Gaining sector insights to inform future planning and networking

Smart Dublin

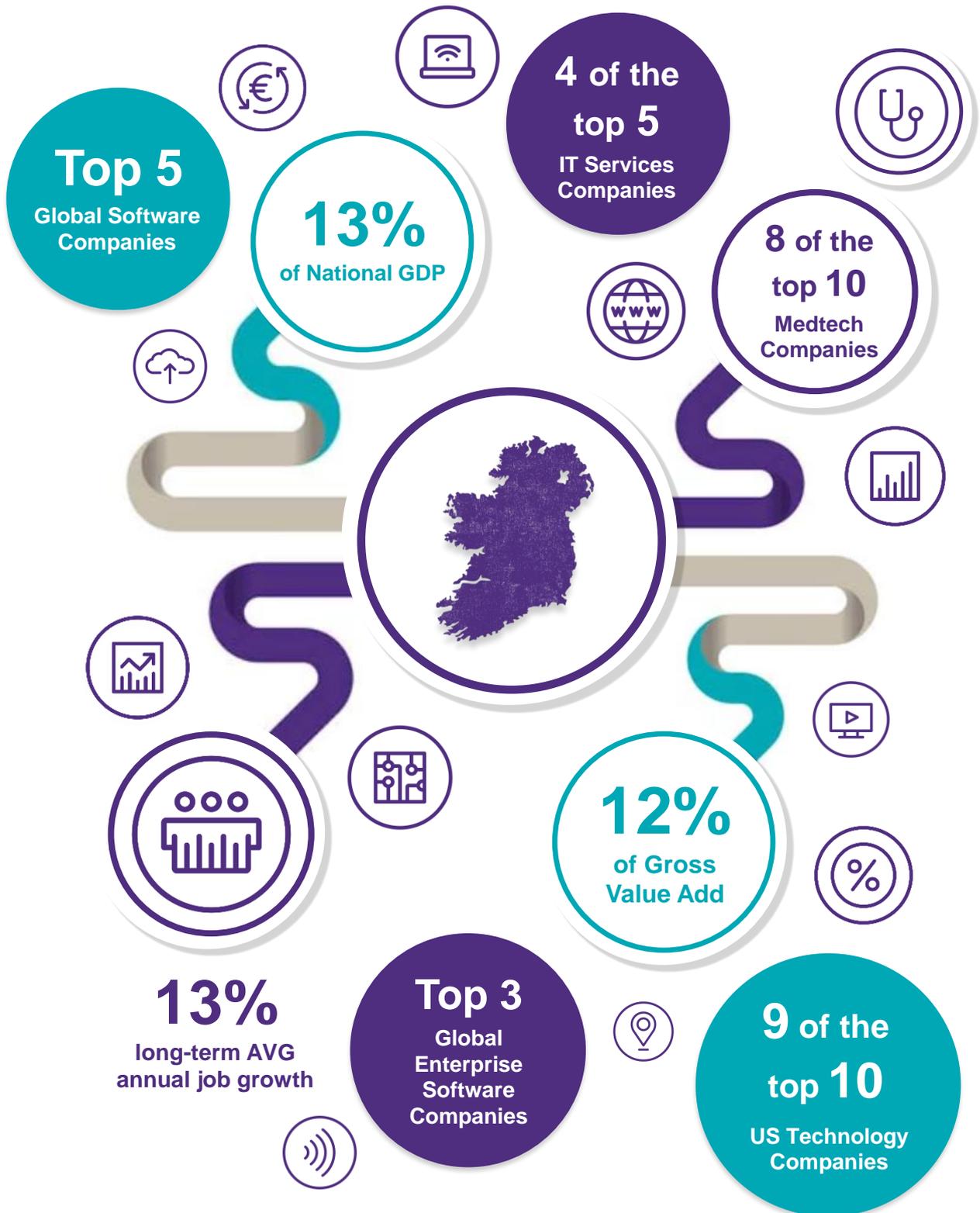
Launched in March 2016, Smart Dublin is an initiative of the four Dublin Local Authorities to engage with smart technology providers, researchers and citizens to solve city challenges and improve city life. Smart Dublin is delivering a programme that encourages the creation of solutions to address city needs. It has an emphasis on using the opportunities offered by emerging technology and public data. The objective of the initiative is to partner and collaborate with internal champions and external stakeholders to:

- Provide Better Services
- Promote Innovative Solutions
- Improve Economic Activity
- Increase Collaboration and Engagement

Technology Skills 2022

Technology Skills 2022 is Ireland's Third ICT Skills Action Plan. The initiative seeks to ensure that Ireland's education and training system continues to meet Ireland's ICT skills needs. The initiative involves multiple government departments and agencies, State-supported bodies, educational institutes and key industry stakeholders.

Ireland's digital economy at a glance



Ireland's regional tech hubs

A shortage of affordable accommodation in Dublin is making Ireland's regions a more attractive proposition for many tech firms

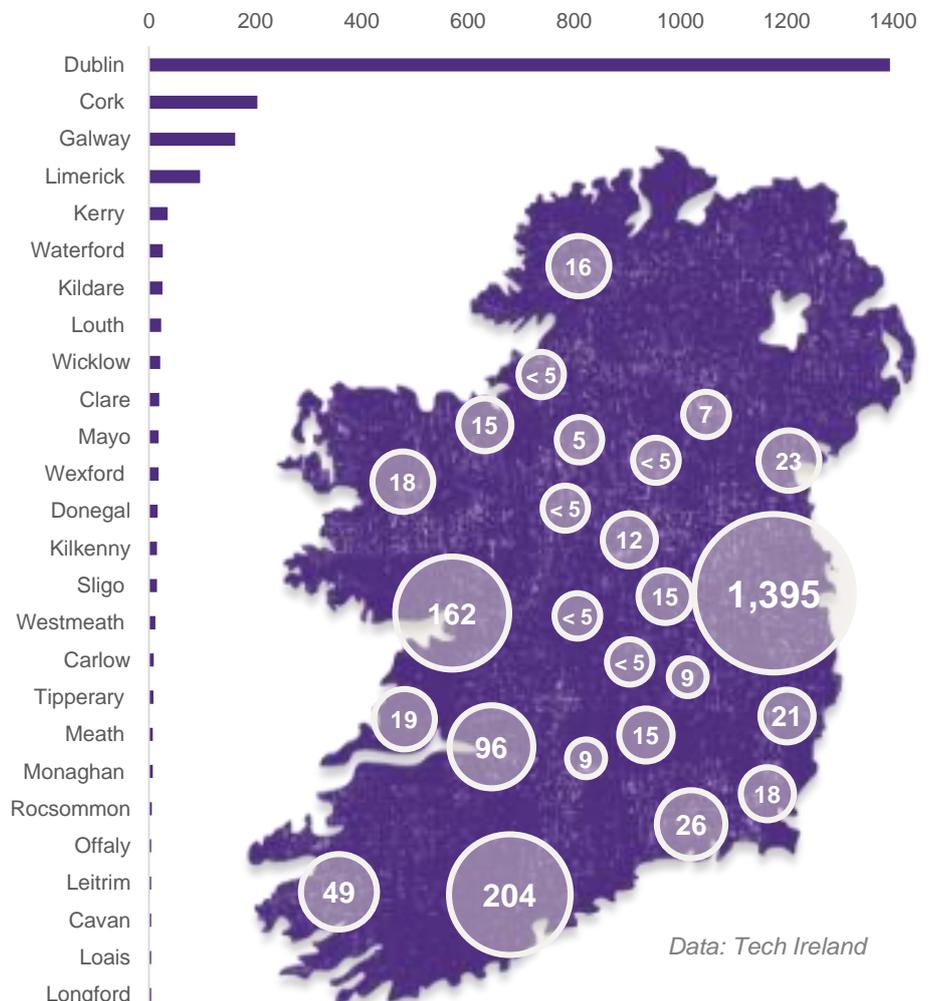


Ireland's regional tech hubs

While Dublin has developed to become a tech cluster of truly global significance, Ireland's regions have also enjoyed considerable success in developing into regional tech hubs in their own right. Data compiled by *Tech Ireland* has found that there are more than 1,725 tech companies based in Ireland outside of Dublin, 341 of which are multinationals.

The emergence of regional digital hubs such as the Ludgate Hub in Skibbereen, the Building Block in Sligo, SportsTech in Limerick, Crystal Valley in Waterford and One Region One Vision in Galway are serving as catalysts for future job creation and innovation among indigenous firms in regional localities.

Figure 3.1: Number of tech companies per county



2,623
Tech companies nationally

424
Tech multinationals

282
Tech hubs nationally

Data: Tech Ireland

Public and private supports for Ireland's digital ecosystem

Dublin is ranked 1st globally in both the *Large City and Economic Potential* categories in the *Global Cities of the Future 2018-2019* report



Supporting Ireland's digital ecosystem

The DHDA is one of many public and private institutional actors that supports the growth and development of the Irish digital tech sector. Others include various Government Departments and Agencies, public and private funding bodies, academic research institutes and enterprise hubs including:

- Department of Communications, Climate Action & Environment
- Department of Enterprise, Trade & Employment Enterprise Ireland
- Local Enterprise Offices
- Science Foundation Ireland
- Guinness Enterprise Centre
- Dublin Business Innovation Centre

It is important to consider this wider network of public and private supports for Ireland's digital ecosystem in the context of evaluating the role and effectiveness of the DHDA.

Department of Communications, Climate Action & Environment

The Department of Communications, Climate Action & Environment (DCCA) is responsible for the delivery of policies and programmes in a number of areas. The objectives of the Communications section include:

- maximising opportunities for economic growth, competition and social inclusion by promoting investment into communications networks
- supporting small Irish business to trade online and enhancing citizen engagement with digital technology
- promoting and supporting the media sector including television, digital, radio and print media

The Department of Enterprise, Trade & Employment

The Department of Enterprise, Trade & Employment (DETE) funds Enterprise Ireland and develops, promotes and co-ordinates enterprise policy in Ireland. The vision of DETE is to make Ireland the best place to succeed in business, delivering sustainable full employment and higher standards of living across all regions.

Enterprise Ireland

Enterprise Ireland is responsible for the funding, development and international growth of innovative start-up companies in Ireland. With a network of more than 30 international offices, Enterprise Ireland partners with entrepreneurs and investors to help companies start, grow, innovate and win sales around the globe

Enterprise Ireland is at the heart of this well established ecosystem, well connected to the supports a start-up requires ranging from funding, mentor support and strategic advice. Enterprise Ireland has developed a €10m fund for international start-ups which offers equity funding to leading edge teams to locate their start-up business in Ireland.

Local Enterprise Offices

Local Enterprise Offices provide a range of supports to help newly established and small enterprises that wish to grow their business. The supports include an initial 'First Stop Shop' service for business information, management skills training, business advice and networking opportunities.

LEOs also provide a range of financial supports designed to assist with the establishment or growth of enterprises employing up to ten people. These services are designed to assist new and existing entrepreneurs at each stage of business development.

Science Foundation Ireland

Science Foundation Ireland (SFI) is the national foundation for investment in scientific and engineering research. SFI funds research in the areas of science, technology, engineering, and mathematics (STEM) which promote and assist the development and competitiveness of industry, enterprise and employment in Ireland.

Through focussed investment in excellent and impactful scientific research and talented researchers, Science Foundation Ireland ensures that Ireland leads the world in strategic research areas, has globally recognised SFI Research Centres and is a hub for industry-academic research collaborations.

"Ireland has made a good job of building a proto-Silicon Valley. By attracting global high-tech names to the country, it provides a high-tech hinterland in which smaller companies can grow ... a whole ecosystem of support."

Ben Rooney, The Wall Street Journal Europe



Tangent at TCD

Tangent, Trinity's Ideas Workspace is a place where all students, staff, and forward-looking external partners have the opportunity to imagine, collaborate, and iterate — putting ideas into action that can positively impact the world.

NovaUCD

NovaUCD is a leading innovation hub with a strong reputation and a proven track record in assisting start-ups to grow and scale internationally. Over 360 companies and early-stage start-ups have been supported through NovaUCD. Between them these companies currently support over 1,040 jobs directly, have an annual turnover in excess of €113 million and have raised over €760 million in equity financing.

DCU Ryan Academy

The DCU Ryan Academy promotes and accelerates early stage entrepreneurship in Ireland. The Academy delivers leading entrepreneur and startup programmes and events and activities which support broader entrepreneur and startup ecosystem development.

The LINC, Technological University Dublin

The LINC (Learning and Innovation Centre) is the Enterprise Innovation & Research Centre on TU Dublin Blanchardstown Campus. The key activities of the LINC are delivering programmes, training, mentoring, facilities and other supports for start-up, high growth potential, knowledge and innovation based enterprises and early stage entrepreneurs.

Guinness Enterprise Centre

The Guinness Enterprise Centre (GEC) is a community of high potential businesses, a hub of entrepreneurial enterprises and business support services. They offer a range of services which include high-spec telecommunications and internet connectivity, supported by wireless connection. They also offer a Virtual Office facility which include coworking space for companies that require a Dublin address without the expense of office space.

Dublin Business Innovation Centre

Dublin Business Innovation Centre (BIC) specialise in investment preparation and providing access to seed capital and angel financing. Dublin BIC manages the AIB Seed Capital Fund, the Halo Business Angel Network (HBAN) and the Guinness Enterprise Centre (GEC), supporting a thriving community of over 300 entrepreneurs.

Dogpatch Labs

Dogpatch Labs is a startup hub, located in the CHQ Building and in the Docklands. The Dogpatch mission is to accelerate the development of startups by providing a community from which to grow, share knowledge and form connections.

WeWork

After opening its first location in Dublin as recently as 2018, WeWork has quickly become one of the city's leading coworking office space providers. WeWork provide coworking office space in 77 cities across 23 countries.

Iconic Offices

After entering the Irish market in 2013, Iconic Offices have become one of the largest flexible workspace providers in Ireland, operating at 16 locations across Dublin. Additional Iconic Office developments are currently under construction.

Grand Canal Innovation District

A government report published in January 2020 made a series of recommendations for the development of a Grand Canal Innovation District, designed to complement Trinity College Dublin's planned development of a Grand Canal Quay campus.

The recommendations of the report included the establishment of a large start-up hub with shared infrastructure to allow scientists and companies to progress developments in the area of digital technology and associated applications.

The flexible coworking office market in Dublin

Ireland is the EU leader in innovation from SMEs as well as in employment and sales impacts *European Commission*

Dublin is 3rd in the FDI Smart Locations of the Future
FDI Intelligence

Dublin is 4th in the European Coworking Hotspot Index
Cushman & Wakefield

Dublin is a Top 30 city in the Global Startup Ecosystem report
Startup Genome

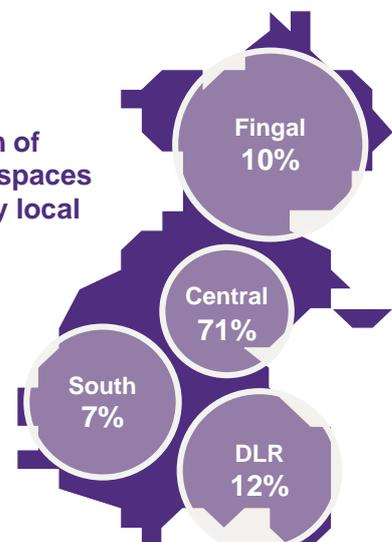
The Digital Hub is the largest cluster of technology, digital media and internet companies in Ireland *DHDA*

NDRC ranked 6th in the World's Top Incubator Linked to a University category *UBI Awards*

Guinness Enterprise Centre ranked 1st globally in the University-Linked Business Incubators and Accelerators category *UBI Awards*

Dogpatch Labs top 10 start-up incubators around the world you need to know *Crunchbase*

Distribution of coworking spaces in Dublin by local Authority



Source: Dublin City LEO

Dublin's Coworking Hubs

	Est. in Ireland	Hub Type	Ownership
Dublin BIC	1988	Coworking / Community / Incubator / Accelerator	Public-Private Centre
Noone Casey	1992	Coworking / Community	Private
IADT Media Cube	1997	Community / Coworking / Research Centre / Education / Incubator / Accelerator	GOV
LINC	1999	Coworking / Research Centre / Education / Incubator / Accelerator	GOV
Glandore	2001	Coworking	Private
Digital Hub	2003	Coworking / Community	GOV
Nova UCD	2003	Research Centre / Education / Coworking / Incubator / Accelerator	GOV
Element 78	2004	Coworking	Private
Office Suites Club	2006	Coworking	Private
WeWork	2010	Coworking	Private
Coworkinn	2011	Coworking	Private
CoCreate	2012	Coworking	Private
Iconic Offices	2013	Coworking	Private
DoSpace	2014	Coworking	Private
Cluster	2015	Coworking	Non-profit
Dogpatch Labs	2015	Coworking / Community	Private
Flexhuddle	2015	Coworking	Private
Workbench BOI	2015	Coworking / Community	Private
Innovate Dublin	2015	Coworking / Community	Social
CampusDublin	2016	Coworking	Private
Huckletree	2017	Coworking / Community / Incubator / Accelerator	Private
Talent Garden	2018	Coworking / Community	Private

Source: Tech Ireland

Ireland's Digital Ecosystem support network



The tech sector and the Dublin office market



Dublin is Europe's leading hub of innovative games companies

The evolution of the tech sector in Ireland

Ireland has come to be described as a global powerhouse in digital technology. Despite being a relatively small island nation, Ireland is the second largest exporter of computer and IT services in the world. With a highly creative and talented workforce, an open economy and a competitive corporate tax environment, Ireland's has attracted some of the largest and most strategically important tech companies in the world. Ireland is currently home to 9 of the top 10 US technology companies, the top 5 global software companies, the top three global enterprise software companies and 4 of the top 5 IT services companies.

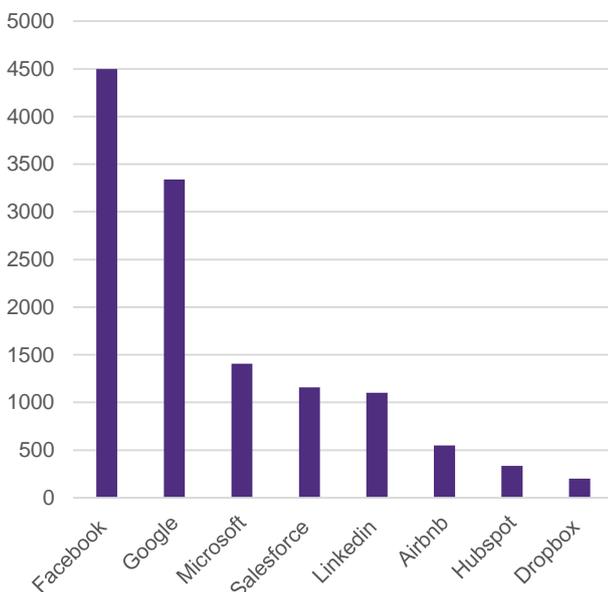
Dublin is the EMEA headquarters for some of the world's largest tech companies including Microsoft, Google, Facebook, Airbnb, Salesforce, Twitter, eBay, Paypal, Indeed, Slack, LinkedIn, Dropbox and Zendesk. The presence of these major tech sector 'anchor' tenants has been a critical factor in establishing Dublin's profile as a global tech sector centre of excellence.

Ireland is the also the European data centre location of choice for world leaders including IBM, Microsoft, Google, Yahoo, MSN and Adobe and is now poised to become a global cloud centre of excellence.

Ireland's reputation for creativity and communication is also fuelling the interest of games companies, with Big Fish, EA, Havok, DemonWare, PopCap, Zynga, Riot Games and Jolt all having a significant presence here. Start-ups and global multinationals seeking a highly educated workforce, world class infrastructure and a supportive policy environment have found exactly what they need in Ireland.

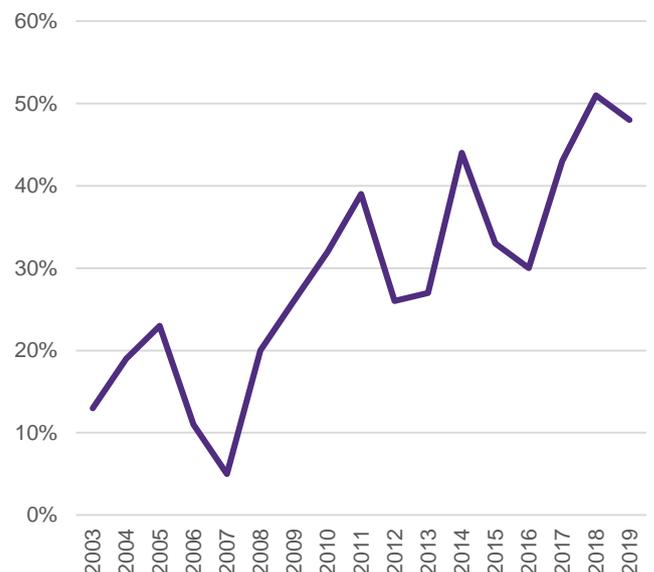
As the Irish tech sector has gone from strength to strength, occupiers from the tech industry have come to dominate the Dublin office market. Approximately half of the total Dublin office market was taken up by the sector in 2019.

Figure 3.2: Number of employees in Dublin 2018



Source: Lisney

Figure 3.3: Share of the Dublin office market taken up by tech companies



Source: Lisney

Dublin is ranked as the 8th most start-up friendly city in Europe

EUStart-ups.com



Demand for flexible office space in Dublin

As the Irish economy has continued to grow consistently in recent years, so too has office based employment, which expanded by 6.4% in Dublin city and county in 2018. Robust demand for new office space has made Dublin one of the leading coworking and flexible office space markets in Europe. There is particularly strong demand for flexible office space in Dublin in light of the city's importance as a global tech sector centre of excellence and the consistent proliferation of start-ups based in the greater Dublin region.

According to research by CRIF Vision-net, almost half of all start-ups established in Ireland in recent years have been based in the greater Dublin area. The fact of such a high concentration of start-ups becoming established in Dublin has coincided with a surge in demand for coworking spaces.

Dublin's dynamic coworking office market is underpinned by an extensive and steadily increasing array of enterprise and coworking centres and spaces that operate across the city.

According to survey research conducted by Dublin City Local Enterprise Office (LEO) there are currently 114 enterprise coworking spaces operated by 61 different service providers across Dublin. A majority (59%) of all coworking spaces available in Dublin have been established since 2008 and more than half plan to expand their existing capacity. Together the five largest flexible office space providers in Dublin (WeWork, Regus, Iconic, Glandore and Pembroke Hall) represent 55% of the market. The market is also heavily concentrated in the Dublin 2 area, where 76 flexible office space providers are located.

This increased availability of enterprise coworking has enhanced Dublin's start-up and enterprise ecosystem. A majority of coworking enterprise space providers in Dublin offer supports and services as well as suitable space to assist enterprises to become established and scale.

While the expansion in total flexible and coworking office space capacity has accommodated many tech sector firms in Dublin, the influx of flexible office space providers has also adversely impacted upon the cost competitiveness of the city's office market.

The number of small direct office space lettings available in Dublin has reduced substantially in recent years, as traditional landlords have found it more difficult to lease smaller spaces on longer term contracts. In response to this some traditional operators have started to offer short term options with the ability to renew leases on an ongoing basis. However, these new flexible lease offerings have come at the expense of higher rents, reduced tenant incentives and the use of break penalties.

Conclusions

The DHDA was established in order to enhance Ireland's capacity in information and communication technologies and to facilitate Ireland's transformation into a knowledge economy. Since the initial establishment of the DHDA in 2003 Ireland's digital tech sector has evolved to become one of the most vibrant and advanced in the world. Ireland's digital ecosystem is also supported by a wide range of public and private sector institutional actors and service providers. The increasing number of enterprise tech hubs and flexible coworking office space providers present in the Dublin market is particularly noteworthy. While the resulting increase in flexible coworking office space capacity has made Dublin an internationally recognised coworking hotspot, the presence of large private coworking office space service providers has contributed towards consistent office rental price inflation.





Market Gap Analysis

Market Gap Analysis

Dublin is ranked 3rd in the FDI Smart Locations of the Future rankings



Introduction

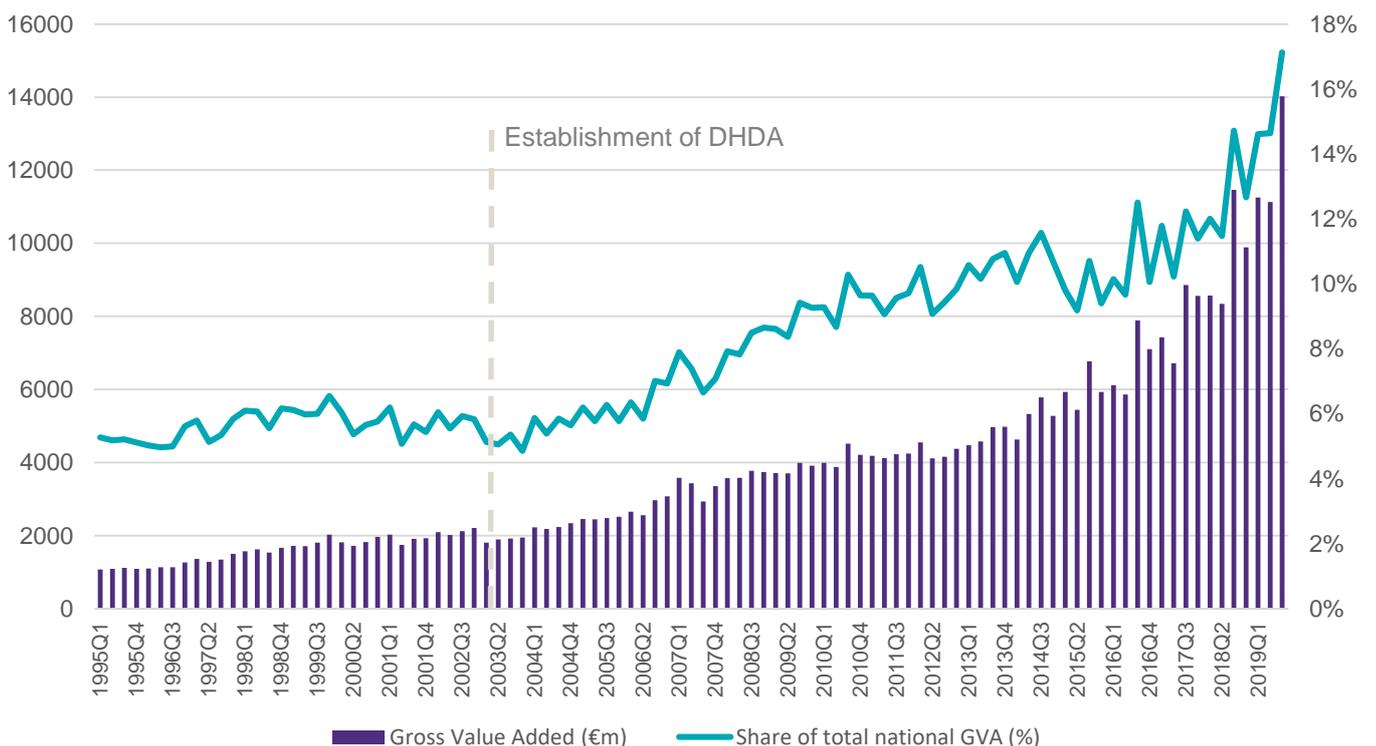
The most fundamental rationale for the Digital Hub Project was that of enhancing Ireland's capacity in information and communication technologies and facilitating Ireland's transformation to a knowledge economy. The statutory functions of the DHDA also include the creation of a digital cluster to contribute towards the socio-economic regeneration of the Liberties area and engagement with the local community in Dublin 8. In light of the significant evolution of the digital sector in Ireland over the past two decades, the question arises as to whether the original remit and function of the DHDA remains valid today. In particular, the argument that State intervention is required in order to provide flexible coworking office space for firms in the digital sector in Dublin should be rigorously tested.

The importance of the ICT sector in Ireland

Since the initial establishment of the DHDA in 2003 the scale and importance of the digital sector in Ireland has increased dramatically. Whereas the ICT sector accounted for just 5.6% of national Gross Value Added (GVA) in 2003, this figure has risen to reach 17.1% more recently. (See Figure 4.1) At 9.9%, Ireland is an extreme outlier among EU countries in terms of the contribution of the ICT services sector to Gross Domestic Product (GDP). (See Appendix A)

While Ireland's Quarterly National Accounts data is generally distorted by the activity of multinationals in the ICT sector, it is nevertheless evident that Ireland's tech sector, digital economy and digital ecosystem is among the most advanced and dynamic in the world.

Figure 4.1: ICT Sector Gross Value Added (€m) and share of total national GVA



Source: CSO

Global tech leaders such as Intel, HP, IBM, Microsoft and Apple have long-established operations in Ireland. They have been joined by a new wave of leading tech giants such as Google, Facebook, LinkedIn, Amazon, PayPal, eBay and Twitter.



Levels of employment in the ICT sector

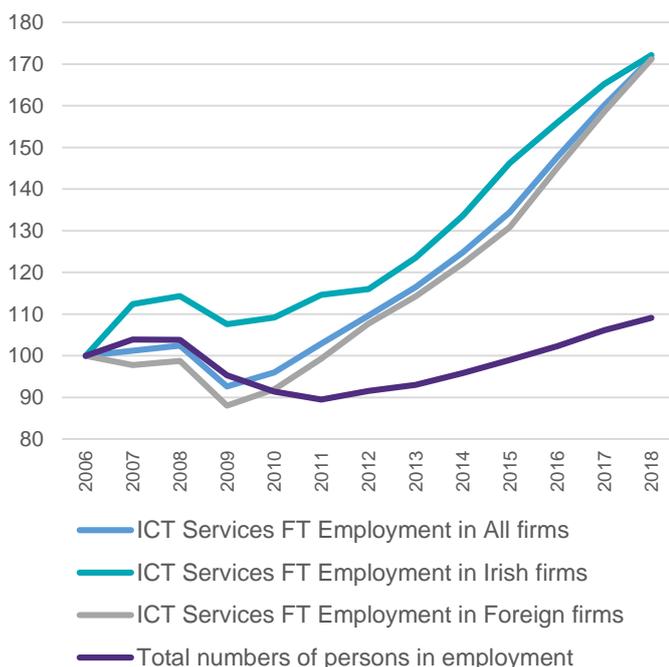
In terms of levels of employment, total employment in the ICT services sector in Ireland has risen from 63,350 in the immediate years following the establishment of the Digital Hub to reach 108,578 in 2018. Over three quarters of all ICT services jobs created in Ireland have been in foreign-owned firms, showing the crucial importance of inward investment to the sector.

The pace of growth in employment in the ICT services sector in Ireland has substantially outpaced that for the wider economy. Whereas total employment rose by 9.1% from 2006-2018, employment in the ICT services sector grew by 71.3% in the same period. Levels of employment in Irish ICT services firms proved to be particularly resilient to the effects of the recent economic downturn, showing the resilience of the sector to macro-financial shocks. (See Figure 4.2)

While foreign firms continue to be the largest employers in the ICT services sector in Ireland, approximately 67% of all workers currently employed in the sector are Irish nationals. (See Figure A.3, Appendix A) However, the pace of growth in employment of non-Irish workers in the sector has been far more rapid than that for Irish nationals in recent years. (See Figure A.4, Appendix A) This trend reflects the fact that many large tech firms based in Ireland tend to recruit internationally in order to fill certain roles.

Encouraging employment in the ICT sector and the enhancement of Ireland's ICT capabilities were some of the key justifications for the Digital Hub project. Available evidence suggests that the goal of encouraging employment in the sector has been successfully achieved.

Figure 4.2: ICT services sector and Total National Employment Indices



Source: DBEI data; GT calculations

Figure 4.3: ICT Services - Permanent Full Time Employment in agency-assisted firms



Source: DBEI

Ireland ranks 2nd in the EU in terms of levels of ICT graduates



Ireland's knowledge economy

In terms of the DHDA's goal of facilitating Ireland's transformation to a digitally-intensive knowledge economy, Ireland is now among the most knowledge intensive and digitised economies in the world.

According to the European Commission's Digital Economy and Society Index (DESI) Ireland is currently ranked 6th in the EU in terms of its digital development and performance. Ireland is number 1 in the EU in the *Integration of digital technology* dimension, particularly because Irish Small and Medium Sized Enterprises (SMEs) excel in the use of e-Commerce. 30 % of Irish SMEs sell online and 17 % sell cross border, well above the EU average of 17 % and 8 % respectively. 26 % of the total turnover generated by Irish SMEs comes from online sales, more than double the EU average of 10 %. Irish companies also rank relatively high on the use of big data (20 %), cloud services (33 %) and social media usage (36 %).

While Ireland has improved its DESI scores for *Connectivity* and *Human capital*, it ranks outside the EU top 10 in both of these dimensions, as well as for the *Use of internet services by people*. In particular, ultrafast broadband coverage is below the EU average and broadband in general is still relatively expensive. The low levels of broadband availability in rural areas has resulted in Ireland having a lower proportion of internet users than the EU average.

Ireland ranks 11th in the EU in terms of the *Human capital* dimension, scoring above the EU average. Ireland also performs exceptionally well in terms of ICT skills. At 4.4% Ireland has the 2nd largest share of ICT graduates and ICT specialists in the workforce, well above the EU average of 3.7 %.

Ireland ranks 10th among EU countries in the Digital public services dimension, above the EU average. Ireland ranks 1st in Open data and 2nd in Digital public services for businesses. However, Ireland performs far more poorly when it comes to eHealth services. Ireland is ranked 21st in the EU for the use of e-health public services and 25th in the use of e-prescriptions. While 63 % of Irish general practitioners (GPs) exchange medical data (well above the EU average of 43 %), only 8 % use e-prescription (well below the EU average of 50 %).

In terms of innovation in the Irish economy, according to the European Commission's Innovation Scorecard Ireland is one of the most innovative economies in Europe. Ireland is ranked as the 10th most innovative economy in the EU, and is categorized as a strong innovator. Ireland scores well above EU average levels in areas such as knowledge-intensive services exports, sales and new-to-market innovations, employment in knowledge-intensive activities and enterprises providing ICT training. (See Figure 4.4 on the next page) While Ireland scores strongly on most metrics, public expenditure in R&D as a percentage of GDP is among the lowest in Europe.

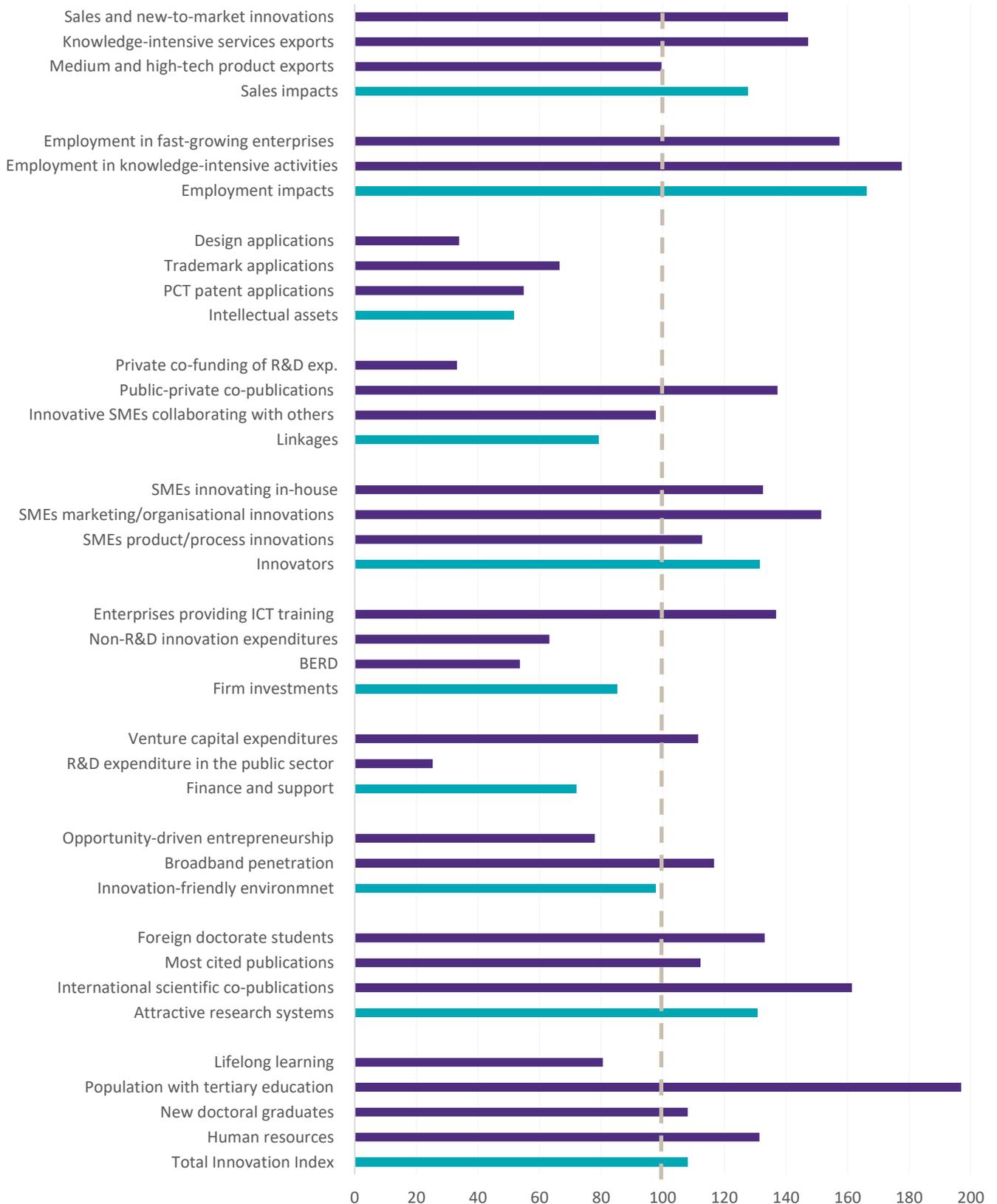
Ireland is found to be an EU outlier in terms of the value-added share of foreign-controlled enterprises, FDI net inflows and top R&D spending enterprises relative to population size, all of which are well above the EU average. These findings stem from the importance of FDI and the presence of global tech multinationals to Ireland's R&D expenditure levels, technological innovation activities and overall innovation performance. (See Appendix B)

While Ireland's SMEs perform exceptionally well in terms of their integration and utilisation of digital technologies, the fact of so many tech multinationals in Ireland can create challenging market conditions for some Irish tech SMEs. High levels of competition for skilled workers has led to high levels of wage inflation in the ICT sector. High levels of demand for office space from tech multinationals has also led to consistently high commercial office space rental inflation in Dublin in recent years. Global tech multinationals tend to be far less sensitive to such cost competitive pressures, as turnover per employee is generally far higher than in indigenous Irish SMEs. Inadequate availability of financing is the most common factor hindering innovation activities in Irish firms. (See Appendix C)

Based upon the empirical data to hand there is no evidence to suggest that the knowledge intensity and continued development of the Irish digital economy is sustained by the services provided by the DHDA.



Figure 4.4: Ireland EU Innovation Scoreboard Index (EU 28 2018=100)



Source: European Commission

Dublin’s flexible and coworking office market

Dublin is ranked 4th in the Cushman & Wakefield European coworking hotspot index



The availability of coworking office space in Dublin

The Dublin flexible and coworking office market has evolved significantly since the initial establishment of the Digital Hub. While there were very few flexible office space options available to firms in the digital tech sector in Dublin in the early 2000s, there are currently a large number of such service providers active in the Dublin market.

According to market data provided by Lisney, there is currently 164,325m² of serviced office space in Dublin. By far the largest service provider is WeWork. At 41,216m², WeWork accounts for 27.2% of Dublin’s total serviced office market. This is followed by Iconic 21,848m² (14.4%) and IWG Regus 15,742m² (10.4%). At 10,498m², the Digital Hub is the 4th largest provider of serviced office space in Dublin, accounting for 6.9% of total capacity.

According to data from Dublin City LEO there are 114 enterprise coworking spaces in Dublin, 81 of which are located in Dublin city centre. Of these 81 centrally located coworking spaces 42 are located within Dublin 2. Three quarters of the office space providers active in Dublin operate as single location space providers. However, a large share of Dublin’s total coworking floorspace is accounted for by major multi-location service providers such as WeWork, Iconic and IWG Regus.

These flexible and coworking office space providers vary in terms of the level and range of supports each provide to their clientele. Such supports can include training, mentoring, networking, availability of event space, hot-desking, communal spaces, investor access and conference facilities.

Figure 4.5: Dublin’s flexible and coworking office market (% of total floorspace) by service provider



Source: Lisney

ECA International ranks Dublin as number 72 on its annual list of the world’s most expensive cities – one place ahead of Silicon Valley



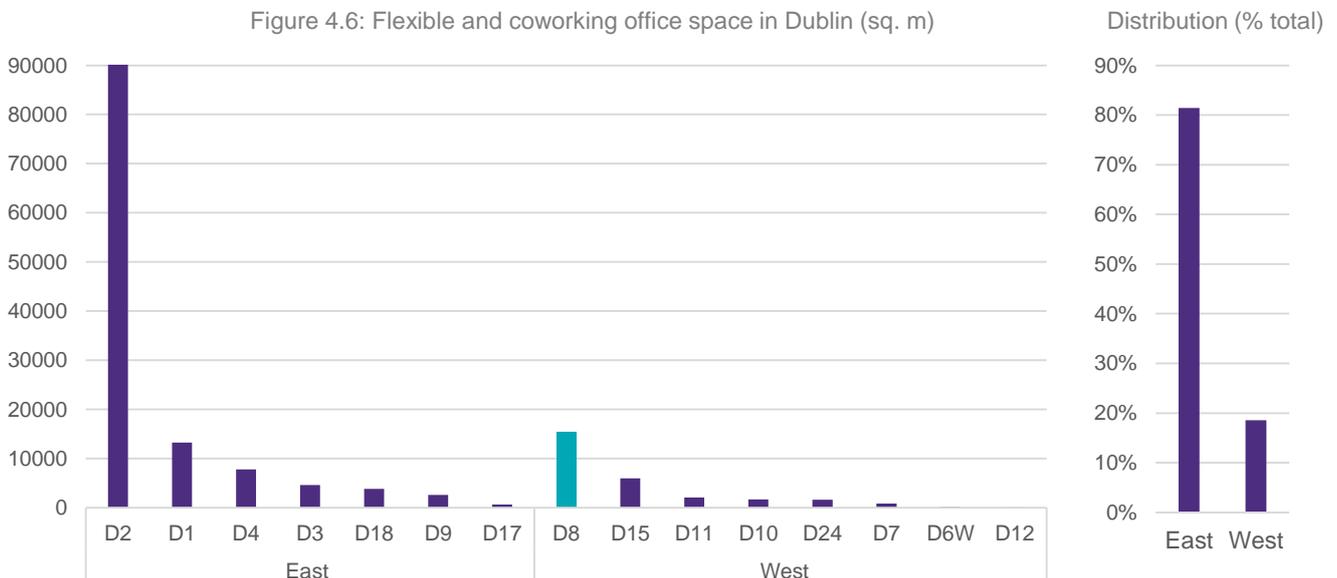
Balancing Dublin’s development as a tech hub

As Dublin city’s total flexible and coworking office space capacity has expanded rapidly over the past decade, the Digital Hub has gradually come to represent a smaller share of Dublin’s total flexible coworking office space. However, according to market data provided by Lisney, Dublin’s newly developed coworking office space capacity has been heavily concentrated on the East side of the city and on the Dublin 2 area in particular. At present, 81.5% of all flexible coworking office space in Dublin is on the city’s East side, with 59.8% of this space located within Dublin 2. Just 10.2% of Dublin’s total coworking office space is located in the Dublin 8 area, 6.4% of which is provided by the DHDA. The imbalances in Dublin’s coworking office market have been driven by the concentration of start-ups and multinational tech companies in the area surrounding the Grand Canal known as the “Silicon Docks”. This trend of increased concentration of tech sector activity within the Docklands area may be set to intensify over coming years in light of plans for the development of a Grand Canal Innovation District. Though widely acknowledged as the epicentre of Ireland’s tech sector, the high concentration of activity in the Grand Canal area has made the area an unaffordable place to live and do business for many entrepreneurs and professionals.

One of the key findings of the stakeholder engagement process for this review is that the Digital Hub serves as an effective counterbalance to Dublin’s Silicon Docks. Many stakeholders emphasised the fact that Dublin’s development as a global tech hub has already been adversely affected by cost competitive pressures, as headline office rents, coworking office rents and residential property rents have risen significantly in the South and North Docks areas over the past decade. By contrast, cost competitive advantage have been widely cited for the strong performance of competing European tech hubs such as Berlin, Prague and Lisbon.

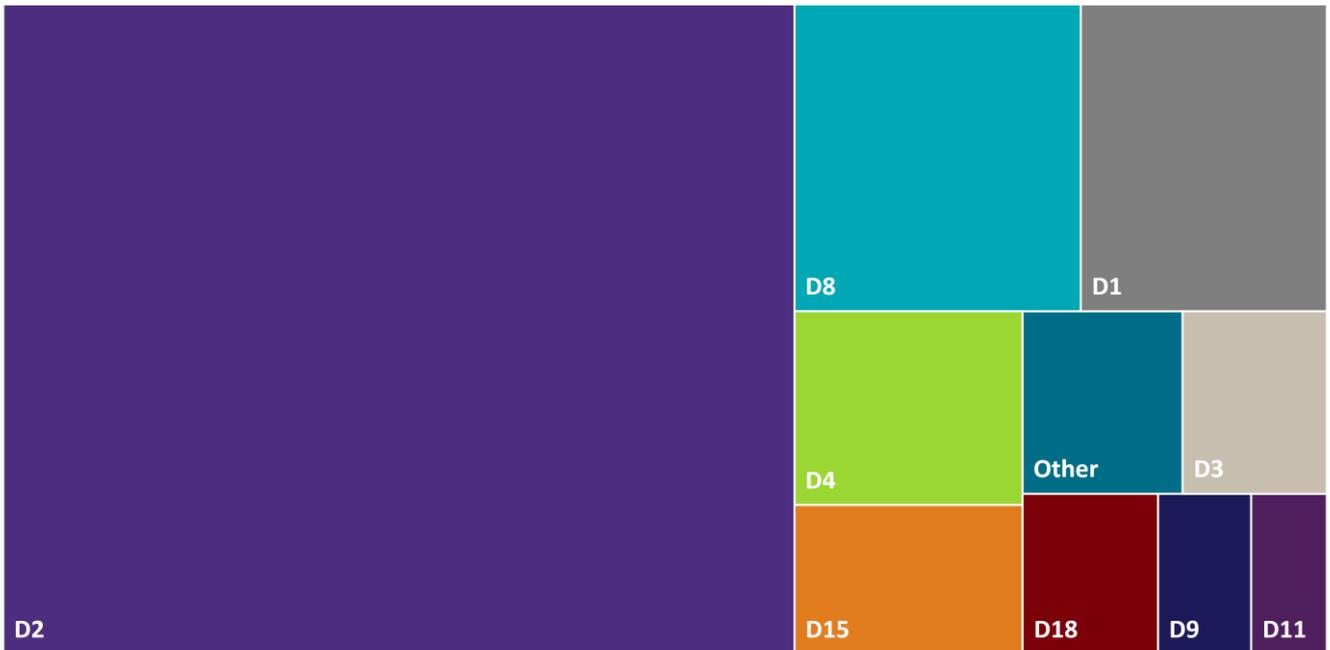
The Digital Hub continues to play the role of providing affordable, flexible and suitable coworking space for firms to scale at a central location in Dublin. Headline office rents and flexible coworking office space costs in Dublin’s South and North Docks areas are significantly higher than in Dublin 8, and would be unaffordable for many entrepreneurs and professionals. The higher average revenue per employee among the major tech multinationals based in the Silicon Docks area makes these firms less sensitive to higher costs associated with their location.

Figure 4.6: Flexible and coworking office space in Dublin (sq. m)



Source: Lisney

Figure 4.7: Distribution of flexible coworking office space in Dublin by area



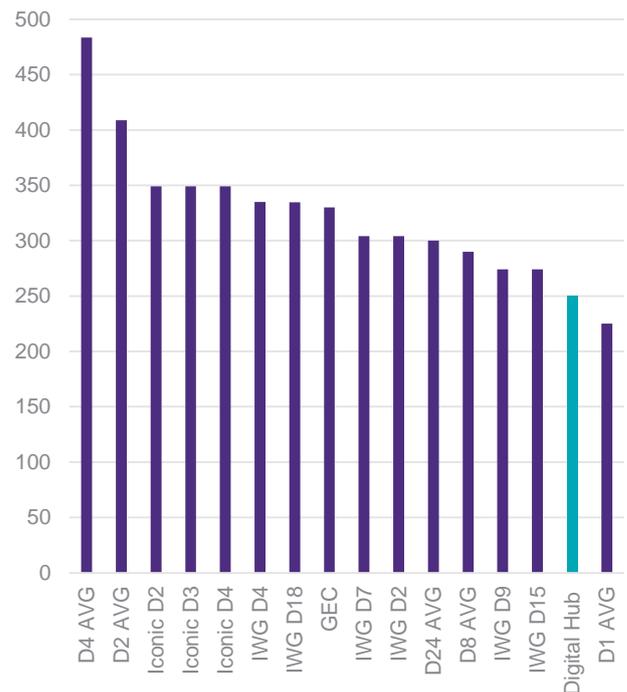
Data: Lisney; DHDA

Figure 4.8: Headline Office Rents (€/sq. ft.) by area



Data: Lisney; DHDA

Figure 4.9: Coworking Rental Costs Dedicated Desk (€/desk/month)



Based upon survey sample of 47 sites
Excludes WeWork

Data: Lisney; DHDA

Ireland is ranked number 1 in the EU's Digital Economy and Society Index (DESI) in the integration of digital technology category



Market Gap Analysis Findings

This phase of the review has consisted of a market gap analysis designed to assess and define the nature of any market failures being addressed by the DHDA. A fundamental rationale for the Digital Hub Project was that of enhancing Ireland's capacity in digitally-intensive information and communication technologies. While justified in the context of the development of the Irish economy in the early 2000s, this strategic goal can now only be viewed as having been achieved. The tech sector in Ireland is one of the most dynamic in the world and there is no empirical evidence to suggest that the continued growth and success of the sector is sustained by the services provided by the DHDA.

In terms of the goal of facilitating Ireland's transformation to a knowledge economy, Ireland is now among the most knowledge intensive economies in the world. While Ireland underperforms in areas such as the development of intellectual assets and public investment in R&D, broadly speaking Ireland is one of the most innovative and knowledge intensive economies in the world. Ireland's strong performance in technological innovation is also not purely a by-product of the presence of global tech multinationals, as Ireland's indigenous SMEs are ranked best in the EU for innovation activities. Based upon the empirical data to hand there is no evidence to suggest that the knowledge intensity of the Irish economy is sustained by the services provided by the DHDA.

As Ireland's digital economy has evolved, so too has the range of public and private supports designed to support the digital ecosystem. These include an extensive and steadily increasing array of enterprise centres and coworking office space service providers that have come into operation across Dublin. The Digital Hub has come to represent just 6.4% of Dublin's total coworking office space capacity. While the expansion of Dublin's flexible coworking office space has made the tech sector less reliant upon the Digital Hub, the DHDA remains among the largest providers of such services in Dublin. The Digital Hub's location in Dublin 8 serves as a much needed counterbalance to the overconcentration of Dublin's coworking office space market in the Docklands and in Dublin 2 in particular. As the Silicon Docks continues to experience cost competitive pressures, the Digital Hub may be the only viable option for cost-sensitive firms looking to locate at an affordable, centrally located coworking office space in Dublin.

Much of the additional coworking office space capacity which has become available in Dublin in recent years has been provided by private market operators. While the additional coworking space capacity provided by these private operators has made the digital sector less reliant upon the Digital Hub, the fact that these firms are wholly commercial in orientation means that their continued presence in the Irish market cannot be taken for granted. In the event that macro financial conditions deteriorate, some of the major market operators may opt to exit the Irish market. The fact that the Digital Hub is a major service provider that is in public ownership means that it provides a stabilisation function within the Dublin coworking office market. This role was evident throughout the course of the global financial crisis period, during which the DHDA continued to provide affordable flexible coworking office space under broadly stable service conditions for its clientele.

The commercial orientation of the major private coworking office space service providers also means that they do not have the same community concerns and responsibilities of the DHDA. The presence of the Digital Hub remains important to the ongoing regeneration of the Liberties, which continues to be one of the most economically disadvantaged areas of Dublin. The educational and other community programmes currently facilitated by the DHDA have a positive impact upon the local community and ought to be maintained through government support, either in their current form or in some other capacity.

In summary, the rapid and successful development of the Irish digital economy since the establishment of the DHDA, the dynamism of the Irish tech sector, the rapid expansion of Dublin's coworking office space capacity and the general ubiquity of digitalism across all economic sectors mean that the continued growth and success of the digital sector in Ireland is not reliant upon the services provided by the DHDA. However, the Digital Hub continues to serve as an important counterbalance to the overconcentration of coworking office space capacity and tech sector activity in the comparatively costly Grand Canal area.





Options Identification

Options Identification



Introduction

This section of the report presents the various options for consideration within the analysis. At the outset of this project seven distinct potential options for the future of the DHDA were drawn up by the members of the Steering Group. This list of seven options was drawn up in close consultation with the DCCAE with a view to listing and considering all available options for examination, while also considering the potential findings of the market gap analysis component of this review. A final shortlist of four investment options were ultimately carried forward for inclusion in the final cost benefit analysis.

Option 1 - Counterfactual

The CBA evaluation method compares and evaluates a range of investment scenarios with a counterfactual baseline scenario. The counterfactual scenario is the 'do minimum' scenario, i.e. an account of conditions that would prevail without the project. The counterfactual must be measured in order to grasp the net change that can be specifically attributed to each of the interventions under consideration. The counterfactual is the amount of change that might have occurred anyway in the absence of the interventions being evaluated. The counterfactual scenario in this case involves retaining the DHDA and the creation of new office space through the redevelopment of the VAT House 7. This is achieved through a combination of the DHDA divesting its own assets, DHDA borrowing and/or Exchequer funding. This option is distinct from option 2 in that it does not involve the divestment of a significant share of the DHDA's assets to another organ of the State. This scenario would see the development of new space using funds raised by selling off some of the DHDA's properties, plus borrowings and Exchequer investment. In this scenario, some of the properties in the Digital Hub's portfolio are sold at market, while some are also sold in return for in-kind refurbishment of unused properties or new-build offices in partnership with private sector operators. Under the counterfactual scenario the total floorspace of the Digital Hub increases from 91,225 ft² today to reach 133,225 ft² by virtue of the provision of an additional 42,000 ft² of office space within the VAT House 7 building. This scenario would result in higher periodic maintenance costs associated with the upkeep of the existing office space and undeveloped sites. This outcome would also result in the payment of the vacant site levy on unused or undeveloped properties, further impairing the financial position of the DHDA.

The aim of eliminating reliance upon Exchequer funding remains a goal of the agency under the counterfactual scenario. However, the additional maintenance costs and additional borrowing that arise under this scenario make achieving commerciality a more challenging prospect.

Option 2 - Retain DHDA but divest a share of assets to the LDA

This option involves the retention of the DHDA and the divestment of a share of the DHDA's property portfolio to the Land Development Agency (LDA). Under this scenario the Digital Hub campus will be substantially redeveloped and consolidated within a share of its existing campus footprint. The divestment of a share of the DHDA's property assets in this manner is designed to unlock value from their redevelopment in order to fund required investment in the remainder of the DHDA campus. As with option 1, this scenario would see the redevelopment of existing coworking office space along with the development of new space using funds raised by divesting some of the DHDA's properties. As distinct from option 1, the process of divesting a share of the DHDA's assets under option 2 is achieved through a strategic partnership with the LDA. This distinction has implications in terms of the scheduling, scale and nature of any potential campus redevelopment, as the LDA has financing capabilities which reduce the DHDA's reliance upon its own financial resources or Exchequer funding. Under option 2 sites within the Digital Hub portfolio are redeveloped with financial resources raised by the LDA. The LDA then develops sites within the current campus for a range of purposes including the Digital Hub's future requirement, social and affordable housing, commercial office space and retail space.

The final scale of the redeveloped Digital Hub campus under option 2 is 150,000 ft², resulting in the deliver of an additional 58,775 ft² of office space as compared to the current scale of operations. This scale of development represents the upper limit of what is expected to be achievable on a market basis through the strategic partnership with the LDA, i.e. without the requirement for additional external funding. The ultimate space delivered will depend on a number of factors including the commercial discussions between the LDA and DHDA, as well as the business case for any potential campus redevelopment masterplan.

10% of the companies currently based at the Digital Hub are healthtech companies



The fact that the LDA can acquire sites from various public and private entities, as well as the fact that the agency's core remit and expertise is that of regenerating and developing under-utilised sites, suggests that option 2 would result in a more strategic and comprehensive approach to the redevelopment of the Digital Hub campus than option 1. The redevelopment of a portion of the Digital Hub campus by the LDA would result in the delivery of social and affordable housing, meeting the pressing societal need that exists for the increased supply of such housing in Dublin. The societal benefits that arise as a result of the non-Digital Hub developments delivered by the LDA are taken to be external to the scope of this evaluation. However, the costs associated with the redevelopment of the Digital Hub campus are captured by the analysis. Under option 2 the Digital Hub would retain its current sectoral focus, i.e. as a cluster of technology, digital media and internet companies. The DHDA would also continue to engage in community outreach activities under option 2.

Option 3 – Retain DHDA, divest a share of assets but designate facilities for a new sub-sectoral cluster

As with option 2, this option involves the retention of the DHDA and the divestment of a share of the DHDA's property assets to the LDA. As with option 2, the DHDA would continue to engage in community outreach activities under option 3. However, as distinct from option 2 this option involves the creation of a new sub-sectoral cluster within the Liberties. The consideration of this option stems from the findings of the market gap analysis and the goal of addressing emerging industry needs. The finding of the market gap analysis undertaken as part of this review was that the DHDA is not required to fill a market gap in digitally-intensive information and communication technologies. The development of the Irish digital economy has been very successful and the continued growth of the digital sector is not reliant upon the services provided by the DHDA. However, there may be particular sub-sectors of industry which are currently underdeveloped in Ireland which do require the establishment of a cluster and other forms of State intervention to support their development.

The formation of a new industrial cluster within the Liberties in this manner may require the establishment of a strong cluster brand, sector-specific managerial expertise, tailored infrastructure and the establishment of strategic partnerships with other institutions

The establishment of a new industrial cluster within the Liberties should be considered with a view to creating positive synergies vis-à-vis the cohort of companies and institutions already based at the Digital Hub. Stakeholder engaged as a component of this review articulated a preference for the establishment of such a sub-sectoral cluster with a focus on e-health. Essentially all health sector stakeholders engaged for this review actively called for the establishment of a dedicated health cluster in Dublin, with sector-specific industry supports and managerial expertise above and beyond the basic provision of flexible coworking office space. Several health sector stakeholders expressed a preference for the adoption of a multi-institutional governance model for such a cluster, i.e. one involving multiple relevant government departments and agencies, as well as academic and health service institutions.

E-health has been defined as the use of technology enabled solutions to address healthcare challenges. E-health stands as an industrial sub-sector within Medtech that is focussed on the utilisation of digital technology to provide healthcare and healthy living solutions. The Liberties has advantages as a location for the establishment of an e-health cluster, including the close proximity of multiple major institutions engaged in health practice and health research, as well as several institutions engaged in communications technology research and design. The Digital Hub already has an established Connected Health initiative which includes collaboration with St James's Hospital, Cork Health Innovation Hub (HIH) and Trinity College Dublin (TCD). The establishment of an e-health cluster could be achieved *within* the Digital Hub or *in parallel* to the Digital Hub campus. The establishment an e-health cluster as a stand-alone entity at a dedicated facility, i.e. *in-parallel* to the Digital Hub, would allow for the provision of sector-specific technical and managerial expertise as well as sector-specific infrastructure and facilities. Such a facility is modelled as being 15,000 ft² in scale and as being additional to the 150,000 ft² of office space provided under option 2. As with option 2, any societal benefits that arise as a result of the non-Digital Hub developments delivered by the LDA are taken to be external to the scope of this evaluation. However, the costs associated with the redevelopment of the Digital Hub campus are captured by the analysis.



Option 4 – Dissolve the DHDA and transfer all assets to other organ(s) of the State

This option would involve the dissolution of the DHDA and the transfer of essentially all of the 5.6 acres of land assets within the DHDA's portfolio to the LDA. The principal justification for consideration of this option is that the continued growth and development of the digital sector in Ireland is not currently reliant upon the services provided by the DHDA. While the market gap analysis has found that there is currently no requirement for the DHDA to fill a market gap as far as the tech sector writ-large is concerned, the same may not be necessarily true for the e-health cluster envisaged under option 3. As a result, option 4 retains the designation of 15,000 ft² of office facilities for the establishment of this e-health sub-sectoral cluster. Option 4 does not require that the e-health cluster be established by the DHDA or that the e-health cluster represents any form of continuity with the Digital Hub in any sense. Neither does the quantitative appraisal take account of the overarching governance model associated with any such e-health cluster.

As distinct from options 2 and 3, option 4 is assumed to result in essentially all of the DHDA's assets transferring to the LDA. Under this scenario the very vast majority of the DHDA 5.6 acres of land assets would be transferred to the LDA to be redeveloped as a mix of social housing, affordable housing and commercial property. Any societal benefits resulting from the redevelopment or repurposing of assets currently held by the DHDA are taken to be external to the scope of this evaluation.

Option 4 is assumed to result in the gradual displacement of the companies currently based at the Digital Hub to other facilities in Dublin.

As the Digital Hub campus is a very substantial and strategically important land bank which includes multiple listed buildings of cultural and historical significance, any repurposing or redevelopment of the land bank would necessitate high levels of State direction and involvement. As a result, this option envisages the transfer of the assets within the DHDA portfolio to some other organ of the State. Option 4 would be likely to result in the redevelopment of the area currently occupied by the Digital Hub campus for a range of purposes, including the delivery of social and affordable housing.

Option 5 – Retain the DHDA and extend remit to act as a coordinator of regional digital hubs

This option would involve the retention of the DHDA and the extension of the scope of the agency to provide flexible office space services and facilities for companies in regions of Ireland beyond Dublin. Under this scenario the DHDA would divest a share of its existing asset portfolio in exchange for the financing and development of new facilities in regional locations. The logic for considering such an option is that Dublin is already a significantly developed and well established tech hub with an abundance of flexible coworking capacity and service providers. By contrast, particular regional locations across Ireland may have underdeveloped ICT sectors and inadequate availability of flexible coworking office space capacity.

While there is currently no market gap to be addressed by the DHDA within the greater Dublin area, an argument could be made to suggest that such a gap does currently exist in regional localities. As a result, extending the scope of the DHDA to act as a provider of flexible coworking space in Ireland's regions was considered.

Option 6 – Dissolve DHDA and establish commercial semi-State company

This option would involve the establishment of the Digital Hub as an off-balance sheet commercial semi-State company. Under this scenario the Digital Hub Development Agency would cease to exist and would be replaced by an off-balance sheet commercial semi-State company which would offer flexible coworking office space to companies in a broadly comparable manner as the DHDA does today.

Under this scenario the commercial semi-State Digital Hub company would not be part of the general government sector. This outcome would result in the new entity having additional freedoms beyond the constraints currently placed upon the DHDA by its founding legislation, which may significantly enhance the commercial potential of the Digital Hub campus. However, under this scenario the new Digital Hub commercial semi-State company would cease to have the statutory obligation to perform specific tasks on behalf of the Government of Ireland as prescribed under the Digital Hub Development Agency Act.

Option 7 – Dissolve the DHDA and dispose of its assets

Under this scenario the DHDA would be dissolved and all of the assets currently held by the DHDA would be sold on the open market. This option was considered in light of the finding that the DHDA is not required in order to fill a market gap either in terms of the continued growth and development of the Irish tech sector or the provision of adequate flexible coworking office space in Dublin. The sale of the entire DHDA asset portfolio under this option is assumed to result in the gradual displacement of the DHDA’s current clientele to other flexible coworking office space facilities in Dublin.

The benefit of the pursuit of this option is limited to the financial windfall associated with the sale of the DHDA’s assets, the gains from which would be absorbed by the Exchequer. In light of the high potential and strategic location of the Digital Hub campus, the opportunity costs resulting from this option would be likely to exceed the current market value of the DHDA’s assets.

Figure 5.1 provides a summary of the full list of 7 options considered at the outset of this evaluation.

Figure 5.1: Full list of options		
#	Option	Description
1	Counterfactual	<ul style="list-style-type: none"> Retain the DHDA Retain current sectoral focus Retain all property assets for DHDA to develop Achieve commerciality
2	Retain DHDA and divest a share of assets to the LDA	<ul style="list-style-type: none"> Retain the DHDA Retain current sectoral focus Divest share of assets to the LDA Achieve commerciality
3	Retain the DHDA, divest a share of assets to the LDA and designate facilities for a new sub-sectoral cluster	<ul style="list-style-type: none"> Retain the DHDA Divest a share of assets to the LDA Designate facilities for a new sub-sectoral cluster Achieve commerciality
4	Dissolve the DHDA and transfer its assets to other organ of the State	<ul style="list-style-type: none"> Dissolve the DHDA Divest property assets to the LDA or other organ(s) of the State Designate facilities for a new sub-sectoral cluster
5	Retain and extend scope to include regional digital hubs	<ul style="list-style-type: none"> Retain DHDA and extend scope Divest share of assets to the LDA Amend current functions to establish digital hubs in regional localities Achieve commerciality
6	Establish the Digital Hub as a semi-state company	<ul style="list-style-type: none"> Dissolve the DHDA Establish the Digital Hub as an off-balance sheet semi-State company
7	Dissolve the DHDA and sell its assets on the open market	<ul style="list-style-type: none"> Dissolve the DHDA Sell all assets on the open market

Options Rationalisation



Option rationalisation

In order to ensure that only viable options are taken forward to full CBA appraisal, several of the initial list of options considered in this analysis have been excluded. This rationalisation of options takes into account factors such as alignment to government strategy, operational feasibility, financial prudence and value for money. Out of the initial list of seven options considered, the following three options have been excluded:

- **Option 5** – Retain and extend scope to include regional digital hubs
- **Option 6** – Establish the Digital Hub as a semi-state company
- **Option 7** – Dissolve the DHDA and sell its assets on the open market

In the case of **option 5**, the extension of the scope of the DHDA to perform its function in regional localities has been found to be unviable. There are currently a large number of small enterprise hubs offering flexible coworking office space facilities in Ireland’s regional localities. As a result there is little evidence to suggest that there is a need for the DHDA to provide such services in regional localities across Ireland.

In the case of **option 6**, the fact that there is no market gap requiring State intervention in the Dublin flexible coworking office space market effectively rules out pursuing option 6.

In the case of **option 7**, the sale of all of the DHDA’s assets on the open market would result in a loss of State direction and involvement in the redevelopment of the area currently occupied by the Digital Hub. This outcome would result in sub-optimal outcomes in terms of the strategic redevelopment and regeneration of the Liberties.

Options 5, 6 and 7 can all be disqualified as each results in less than satisfactory outcomes from a strategic policy alignment perspective.

In light of the exclusion of inappropriate options for consideration a shortlist of four of the initial seven options considered were shortlisted for full consideration within the CBA. This shortlist of four options has been fully economically appraised, the results of which are described in the next section of the report.



Figure 5.2: Shortlist of options for evaluation

#	Option	Description
1	Counterfactual	<ul style="list-style-type: none"> • Retain the DHDA with current sectoral focus • Retain all property assets for DHDA to develop • Achieve commerciality
2	Retain DHDA and divest a share of assets to the LDA	<ul style="list-style-type: none"> • Retain the DHDA with current sectoral focus • Divest share of assets to the LDA • Achieve commerciality
3	Retain the DHDA, divest a share of assets to the LDA and designate facilities for a new sub-sectoral cluster	<ul style="list-style-type: none"> • Retain the DHDA • Divest a share of assets to the LDA • Designate DHDA facilities for a new sub-sectoral cluster • Achieve commerciality
4	Dissolve the DHDA and transfer its assets to other organ of the State	<ul style="list-style-type: none"> • Dissolve the DHDA • Divest all property portfolio assets to other organ(s) of the State • Designate facilities for a new sub-sectoral cluster



Quantitative Appraisal

Quantitative Appraisal



Introduction

A cost benefit analysis is an economic evaluation methodology that enables the comparison of a range of investment options in terms of their efficiency and effectiveness. This is achieved through considering and comparing the stream of benefits that arise from undertaking each particular option considered, as well as a comparative analysis of the financial resources required to deliver each respective option. There are a number of quantitative evaluation metrics and analytical techniques which are utilised to evaluate the options considered including:

- Net Present Value
- Benefit Cost Ratio
- Internal Rate of Return
- Sensitivity Analysis

This section of the report presents the benefits and costs that are expected to arise under each option considered in the analysis, as well as the findings of the quantitative economic evaluation.

The DHDA has been appraised in both ex poste and ex ante terms, i.e. in terms of the cost and benefits that the establishment of the DHDA has resulted in heretofore, as well as an appraisal of the costs and benefits that are projected to arise under each of the options considered for the future direction of the DHDA.

Costs

All of the options considered within this analysis result in up-front capital investment costs, periodic maintenance costs and operational expenditure costs over a twenty year time horizon. The largest capital and operational costs arise under options 2 and 3. This is because options 2 and 3 envisage the redevelopment of the Digital Hub campus on a far more substantial scale than the other options considered. Options 2 and 3 result in the development and delivery of 139,350 ft² and 154,350 ft² of redeveloped office space respectively. Once the floorspace within the recently developed Grainstore building is taken into account, options 2 and 3 result in the final delivery of 150,000 sq² and 165,000 ft² of office floorspace respectively. The quantum of floorspace delivered under option 3 is higher as this option includes the provision of facilities for a new sub-sectoral cluster which is additional to that provided under option 2.

By contrast, option 1 envisages the development of the Vat House 7 site for the purpose of providing an additional 42,000 ft² of floorspace. This 42,000 ft² of newly developed floorspace is in addition to the 91,225 ft² of floorspace that is currently in use at the Digital Hub campus. Option 1 also involves the continued use and periodic maintenance of most of the existing buildings within the DHDA asset portfolio, resulting in lower up-front capital investment costs but higher periodic maintenance costs.

Figure 6.1: Total costs of options considered (2020-2040)

#	Option	PV Capex	PV Current
1	Counterfactual	€21,828,005	€74,217,074
2	Retain DHDA and divest a share of assets to the LDA	€31,180,183	€52,542,193
3	Retain the DHDA, divest a share of assets to the LDA and designate facilities for a new sub-sectoral cluster	€34,536,500	€55,967,692
4	Dissolve the DHDA and transfer its assets to other organ of the State	€2,739,977	€7,182,992



(Costs Contd.)

Operational costs under options 2, 3 and 4 are assumed to rise or fall in proportion to the quantum of office floorspace provided relative to the counterfactual scenario. The transfer of land to the LDA is assumed to result in no opportunity cost implications, as the LDA is assumed to realise the full potential value of these sites for the State.

Benefits

In terms of the benefits that are expected to arise under each of the options considered in the analysis, these include:

- Commercial Income
- Clustering effect Gross Value Added (GVA)
- Residual values of properties

Commercial income levels are projected to differ across each of the options considered according to the quantum of office floorspace provided. Commercial income levels under options 2, 3 and 4 rise or fall in proportion to their lettable floorspace as compared to the levels witnessed under the Vat House 7 site redevelopment under the counterfactual scenario.

While forecasting the future levels of commercial income that will arise under the options considered is relatively straightforward, it is more challenging to accurately quantify the clustering effect of the Digital Hub, i.e. the increased GVA stemming from the fact that the DHDA's client companies are active within a single hub. Industrial clustering is defined as firms from the same industry gather together in close proximity. When similar businesses are grouped together in close proximity this results in productivity improvements stemming from factors such as:

- Industrial organisation and scaling
- Knowledge spillovers
- Diffusion of technology and expertise
- Business support services
- Improved FDI incentives
- Attraction of international talent
- Availability of specialised labour
- Availability of specialised infrastructure
- Pooling of resources and requirements

There is broad consensus that firms based within tech clusters are more productive than those that aren't, and that such productivity improvements stem from the fact of their close proximity to other firms engaged in similar activities. However, any attempt to measure such improvements must account for a potentially broad range of confounding explanatory variables and the possibility of displacement. Extant research has sought to quantify the precise levels of productivity improvement that companies enjoy by virtue of operating within a high density tech cluster. In 'The Effect of High-Tech Clusters on the Productivity of Top Inventors' Enrico Moretti (2019) utilises a large survey sample of companies active in US tech clusters to test the relationship between the size of a cluster and the productivity of inventors active within each cluster. Conditional on year, city, field and class effects, the elasticity of the number of patents produced with respect to cluster size is 0.0514 (0.00812). Moretti also uses the estimated elasticity of productivity with respect to cluster size to quantify the aggregate effects of geographical agglomeration on the overall production of patents in the US as a whole. (See Appendix D)

This analysis utilises the findings of Moretti's study to quantify the GVA uplift of firms based within the Digital Hub. Conditional on year, city, field and class effects the estimated elasticity with respect to cluster size in Moretti's study is 0.05114 (0.00812). Taking the CSO's annual ICT services sector GVA per employee data as a baseline, the analysis applies the estimated elasticity of productivity with respect to cluster size to quantify the aggregate effects of geographical agglomeration on total GVA for the cohort of companies based in the Digital Hub. This addresses the issue of displacement as the GVA of the companies based within the Digital Hub is already captured by the national sectoral GVA per employee data before being measured using the beta coefficients derived from the regression model.

Finally, the analysis takes account of the residual value resulting from the up-front investments made across all of the options considered. These investment are assumed to result in properties that have a life cycle of at least 50 years. The analysis also assumes straight-line depreciation across all properties. As the ex-ante time horizon of the analysis is 20 years the relevant investments retain 60% of the value that is attributable to the initial intervention in year 20.

Total Costs & Benefits



Figure 6.2: Summary of Total Costs and Benefits (2020-2040)

		Option	Total (2020-2040) Present Values
Costs	Operational Costs	1	€74,217,074
		2	€52,542,193
		3	€55,967,692
		4	€7,182,992
	Capex Costs	1	€21,828,005
		2	€31,180,183
		3	€34,536,500
		4	€2,739,977
	Total Costs	1	€105,563,440
		2	€105,679,511
		3	€114,461,062
		4	€12,632,240
Benefits	Commercial Income	1	€67,217,177
		2	€74,257,890
		3	€80,576,442
		4	€11,052,427
	Clustering Effect GVA Uplift	1	€144,572,368
		2	€159,592,254
		3	€173,073,616
		4	€3,486,010
	Residual Value of Properties	1	€1,613,557
		2	€5,353,552
		3	€14,824,556
		4	€576,270
	Total Benefits	1	€213,403,102
		2	€239,203,696
		3	€268,474,614
		4	€15,114,708

Further presentation of results, as well as details regarding key assumptions, is provided in Appendix E

Appraisal Results



Net Present Value and Benefit Cost Ratio comparison

The most crucial step in a CBA is the calculation and comparison of the net present values (NPVs) of the options considered. The NPV is generally viewed as the most reliable indicator to assess and compare a range of investment options. The key determinants of the NPV calculation are the appraisal horizon, the discount rate and the accuracy of estimates for costs and benefits. In the NPV method the revenues and costs of a project are estimated before being discounted and compared. The preferred option is that with the highest positive NPV. Projects with negative NPVs should not proceed in most cases because the present value of the stream of benefits is insufficient to recover the cost of the project. The Benefit Cost Ratio is also an important indicator for public investment appraisal purposes. The BCR is the ratio of total benefits to total costs when total benefits and total costs are expressed in discounted present value terms. In other words, the BCR is discounted net revenues divided by discounted net costs. The preferred option is typically that with the ratio value most in excess of 1. A project with a BCR of less than one should generally be reconsidered or should not proceed in most cases. In addition, any such decision should also take into account non-quantifiable benefits. After the application of the recommended discount rate of 4%, as provided by the Department of Public Expenditure and Reform (DPER), all of the options considered return positive NPVs.

The highest NPV result is recorded for option 3. This result is due to the fact of higher commercial income and a larger scale clustering effect for option 3. Option 3 results in the highest levels of commercial income among all of the options considered due to the fact that this option has the largest lettable floorspace. This is due to the establishment of an e-health cluster under option 3, which is taken to be additional to the floorspace of the Digital Hub under option 2. Option 3 also results in the creation of a larger cluster, as the cohort of companies based within the e-health cluster under option 3 are taken to be additional to those based within the Digital Hub. While this cohort of e-health companies may exist in a distinct facility, either *within* or *in parallel* to the Digital Hub, the analysis assumes that these companies benefit from their close proximity to the companies based at the Digital Hub. The increased GVA enjoyed by the companies based in this cluster-within-a-cluster are taken to be proportionate to the increased scale of the total cluster as compared to that resulting under option 2. While option 3 is more costly than option 2, these increased costs are outweighed by the increased benefits resulting under option 3. In terms of the balance of benefits resulting under each option considered, the clustering effect GVA uplift accounts for approx. 65% of benefits across option 1-3, and 22% of the total value of benefits under option 4. This comparatively modest clustering effect under option 4 is the result of the fact that option 4 establishes a distinctly smaller cluster than options 1-3.

Figure 6.3: Floorspace outcomes, NPV results and BCR results

#	Option	Total Floorspace	Lettable Floorspace	NPV	BCR
1	Counterfactual	133,225 ft ²	112,048 ft ²	€107,839,662	2.0
2	Retain DHDA and divest a share of assets to the LDA	150,000 ft ²	126,156 ft ²	€133,524,186	2.2
3	Retain the DHDA, divest a share of assets to the LDA and designate facilities for a new sub-sectoral cluster	165,000 ft ²	138,772 ft ²	€154,013,553	2.3
4	Dissolve the DHDA and transfer its assets to other organ of the State	15,000 ft ²	12,616 ft ²	€2,482,468	1.2

Sensitivity Analysis



The NPV and BCR results remain distinctly positive for the counterfactual scenario. However, the higher periodic maintenance costs, costs associated with unoccupied properties and lower commercial income levels under the counterfactual scenario result in lower NPV and BCR results. Option 4 performs less favourably in the quantitative appraisal as a result of the fact that more costs and benefits are taken to be external to the analysis under this option. However, option 4 does have the potential to provide a greater contribution in addressing other market structural imbalances and societal needs beyond the tech sector.

Sensitivity Analysis

Conducting sensitivity analysis is standard practice in CBA evaluations as a means of dealing with inherent uncertainty in planning future investment projects. Cost Benefit Analysis includes the use of long-term forecasts and assumptions that are subject to a potentially wide margin of error, as well as difficulties in quantifying future costs and benefits. The purpose of sensitivity analysis within a CBA is to establish the extent to which the outcome of the analysis is sensitive to changes in the values of particular data inputs and to see if the ranking of options under consideration is altered under adjusted conditions and assumption. The sensitivity analysis should highlight critical risk factors and areas that may require further consideration and analysis. The sensitivity analysis also indicates how robust the findings are to deviations from current forecasts and assumptions. In doing so it enables the generation of a more robust assessment of results for each project and allows for more prudent project planning. The sensitivity analysis in this case examines the following:

- Adjustment of the discount rate employed
- Adjustment to the forecast capital and operating costs
- Internal Rate of Return (IRR)

The first sensitivity test examines the impact of an adjustment to the discount factor employed, i.e. the guidance discount rate of 4% provided by the Department of Public Expenditure and Reform (DPER). A higher discount rate will reduce the value of future costs and benefits, while not impacting the value of costs accrued in Year Zero.

A sensitivity test is highly relevant to the evaluation of programme of investment given the level of general uncertainty around the economic climate and financial conditions in the medium to longer term. Repeating the analysis with an adjusted discount rate tests whether the outcomes of the project are robust enough to withstand a future increase in interest rates, and whether they can still deliver a positive return under such conditions.

The purpose of running a sensitivity analysis on the discount rate is not to adjust the analysis so as to increase the inferred desirability of a project. It is simply an exercise to identify the extent to which its desirability comes down to a subjective view on the issue of time preference. The purpose of running a sensitivity analysis on the costs associated with each option is to pre-empt the possibility of future increases in inflation. While the cost estimates contained within the analysis already include forecast future inflation, these may yet be exceeded. It is therefore important to evaluate all of the options considered to test their relative sensitivity to the possibility of future cost overruns. All of the options within the analysis are subjected to the following sensitivity tests:

- Discount rate of 8%
- Cost overrun of 20% with 4% discount rate
- Cost overrun of 20% with 8% discount rate
- Cost overrun of 50% with 4% discount rate
- Cost overrun of 50% with 8% discount rate

The findings of the sensitivity test analysis are contained within figure 6.3 on the next page of this report. Options 1, 2 and 3 are all found to return positive NPV values under adverse financial conditions and in the event of substantial cost overruns. Option 3 is found to have the highest NPV and BCR results under all conditions modelled. Option 4 is found to be highly sensitive both to the effects of adverse financial conditions and cost overruns. This finding is due to the fact that option 4 results in far lower levels of commercial income and other benefits as compared to the other options considered.

Sensitivity Test Results



Figure 6.4: Sensitivity Test Results

#	Option	Discount Rate	Cost Overrun	NPV	BCR
1	Counterfactual	4%	0%	€107,839,662	2.0
		8%	0%	€69,748,748	1.9
		4%	20%	€86,726,974	1.7
		8%	20%	€52,906,262	1.5
		4%	50%	€55,057,942	1.3
		8%	50%	€27,642,533	1.2
2	Retain DHDA and divest a share of assets to the LDA	4%	0%	€133,524,186	2.3
		8%	0%	€86,899,704	2.0
		4%	20%	€112,388,283	1.9
		8%	20%	€70,155,228	1.7
		4%	50%	€80,684,430	1.5
		8%	50%	€45,038,516	1.4
3	Retain the DHDA, divest a share of assets to the LDA and designate facilities for a new sub-sectoral cluster	4%	0%	€154,013,553	2.3
		8%	0%	€97,961,772	2.0
		4%	20%	€131,121,340	1.9
		8%	20%	€79,860,934	1.7
		4%	50%	€96,783,022	1.5
		8%	50%	€52,709,676	1.3
4	Dissolve the DHDA and transfer its assets to other organ of the State	4%	0%	€2,482,468	1.2
		8%	0%	€891,044	1.1
		4%	20%	-€43,980	0.9
		8%	20%	-€1,093,550	0.9
		4%	50%	-€3,833,652	0.8
		8%	50%	-€4,070,441	0.7

Internal Rate of Return



Internal Rate of Return Analysis

The current discount rate specified in the Department of Public Expenditure and Reform's (DPER's) Public Spending Code for public sector investment projects of the type under consideration in this analysis is 4%. Both of the preceding sensitivity tests used an adjusted discount rate to assess the relative robustness of the various investment options considered.

Another effective indicator of the relative robustness of the options considered in a CBA is the Internal Rate of Return (IRR). The IRR is the discount rate which, when applied to net benefits of a project option, sets them equal to the initial investment. In other words, the IRR is the discount rate which would result in a NPV of zero for the project option. The higher the IRR, the greater the confidence level that the NPV of the investment will be positive. This IRR analysis can be undertaken for each respective option while also including the same cost overrun levels tested in the preceding section.

In the event of cost overruns of 20% and 50%, options 2 and 3 retain distinctly high IRR values. With no cost overrun and a discount rate of 42% the counterfactual scenario breaks even. In the absence of any cost overrun and a discount rate of 12% option 4 breaks even. This finding indicates that option 4 is the least robust.

Options 2 and 3 do not return IRR values in the absence of a cost overrun, indicating that no discount rate will reduce the NPV to zero. This finding is further evidence of the robustness of options 2 and 3.

The IRR for option 4 turns negative in the event of a 50% cost overrun, indicating that the aggregate amount of cash flows resulting from option 4 would be less than the amount of the initial investment once a 50% cost overrun is applied.

#	Option	Cost Overrun	IRR
1	Counterfactual	0%	42%
		20%	28.2%
		50%	16.3%
2	Retain DHDA and divest a share of assets to the LDA	0%	
		20%	52.3%
		50%	23.7%
3	Retain the DHDA, divest a share of assets to the LDA and designate facilities for a new sub-sectoral cluster	0%	
		20%	45.6%
		50%	23%
4	Dissolve the DHDA and transfer its assets to other organ of the State	0%	12%
		20%	3.9%
		50%	-5.7%

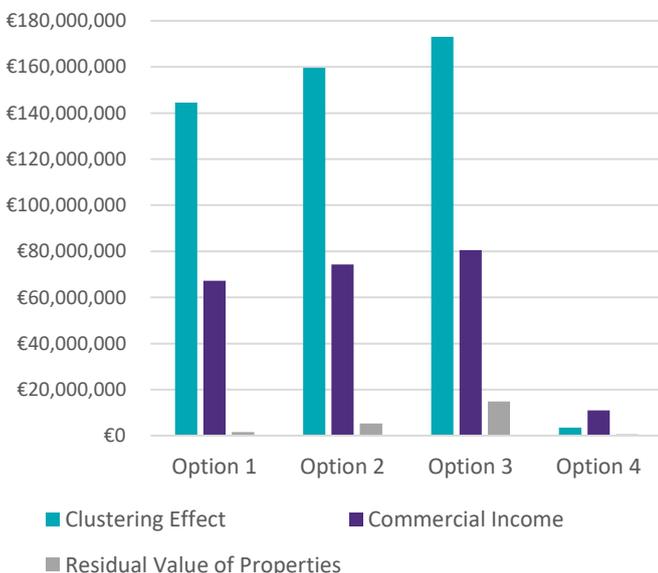
Cluster Effect Sensitivity Analysis

Cluster Effect Sensitivity Analysis

The largest share of benefits that arise in this analysis result from the GVA uplift caused by the effects of industrial clustering. (See Figure 6.6) This analysis has utilised the findings of Moretti (2019) to quantify the GVA uplift of firms based within the Digital Hub. Conditional on year, city, field and class effects the estimated elasticity with respect to cluster size in Moretti’s study is 0.05114 (0.00812). Utilising the CSO’s annual ICT services sector GVA per employee data as a baseline, the analysis has applied the estimated elasticity of productivity with respect to cluster size to quantify the aggregate effects of geographical agglomeration on total GVA for the cohort of companies based in the Digital Hub.

In order to test this clustering effect benefit as a sensitivity the CBA analysis has been repeated but with a reduced clustering effect. Figure 6.7 shows the CBA results with the industrial clustering effect reduced by 0% (baseline), 25% and 50%. The table also shows the overall CBA results with no clustering effect whatsoever, i.e. with a 100% reduction in the clustering effect. These clustering effect sensitivity results have all been generated with a 4% discount rate and no cost overruns.

Figure 6.6: Total Benefits (PV) (2020-2040) by Benefit Type



When the industrial clustering effect is reduced by 25% all of the options considered return positive NPV and BCR results. Similarly, all of the options continue to return positive NPV and BCR results even when the industrial clustering effects is reduced by 50%. However, in the total absence of the industrial clustering effect benefits all of the options return negative NPV and BCR results. These findings illustrate the distinct importance of this clustering effect as the key justification for the Digital Hub. This result also highlights the need to pro-actively facilitate and encourage clustering and agglomeration among the firms based in the Digital Hub.

Figure 6.7: Clustering Effect Sensitivity Results

Option	Clustering Effect Reduction	NPV	BCR
1	0%	€107,839,662	2.0
	25%	€71,696,570	1.7
	50%	€35,553,478	1.3
	100%	-€36,732,706	0.7
2	0%	€133,524,186	2.3
	25%	€93,626,122	1.9
	50%	€53,728,058	1.5
	100%	-€26,068,069	0.8
3	0%	€154,013,553	2.3
	25%	€110,745,149	1.9
	50%	€67,476,744	1.5
	100%	-€19,060,064	0.8
4	0%	€2,482,468	1.2
	25%	€1,610,965	1.128
	50%	€739,463	1.059
	100%	-€1,003,542	0.921

Almost 90% of coworking spaces in 2019 generate a profit if they meet at least three conditions: they have more than 200 members, are older than one year, and do not subsidize their operation through other businesses.

Deskmag



Budgetary Implications

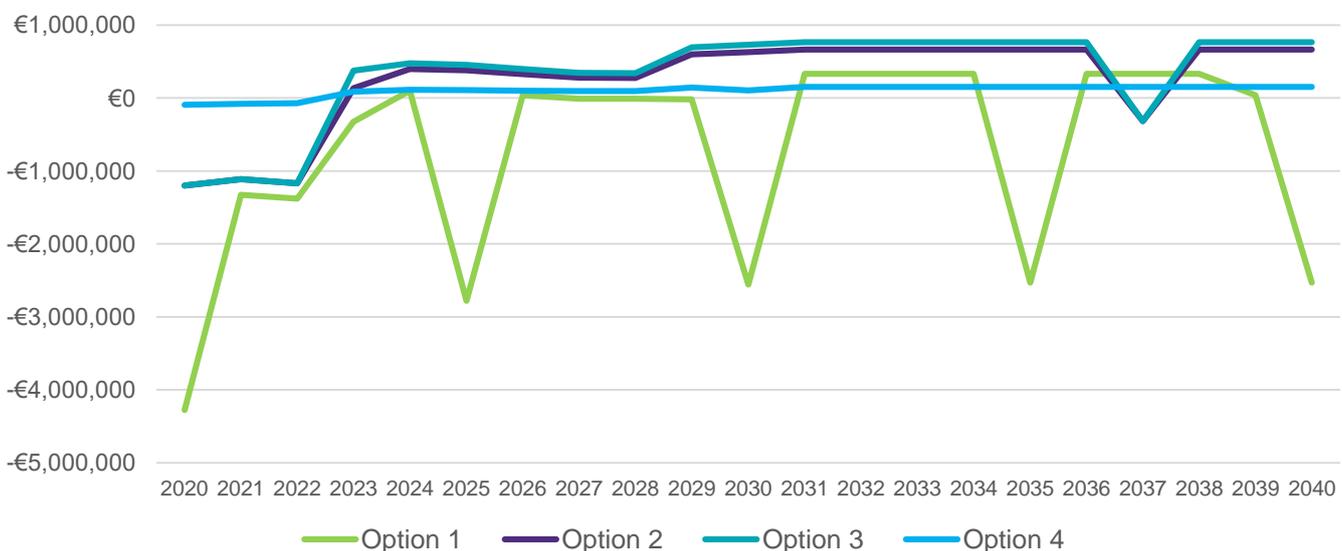
In addition to an economic appraisal of options for the future direction of the DHDA, this review also considers the fact of the agency’s current subvention requirement. The findings of the market gap analysis suggest that the DHDA is not required in order to sustain the growth and development of the tech sector in Ireland. The implication of this finding is that the DHDA should either cease to operate or continue to operate on a purely commercial basis, i.e. without the need for Exchequer funding.

On the basis of the modelled annual income and expenditure forecasts the analysis finds that options 2, 3 and 4 alleviate the requirement for Exchequer funding beyond 2023 following a development period of three years covering mid 2020 to mid 2023. These modelled timelines pre-date the onset of the covid-19 pandemic and are thus likely to be subject to revision. A development timeline of three years is taken to be achievable in these scenarios in light of the central role of the LDA in the planning, financing and management of the relevant developments. However, the role of the LDA in option 2, 3 and 4 is subject to other dependencies, such as access to the requisite level of financing.

Option 1 does not result in the DHDA becoming commercially sustainable in the long-term, as this option results in higher periodic maintenance costs due to many of the existing DHDA structures remaining in use. By contrast, options 2, 3 and 4 avoid these same costs as a result of the up-front capital investment programme funded through partnership with the LDA. The onset of Covid-19 is likely to have a significant negative impact upon the DHDA’s commercial income in 2020 and beyond. Though the impacts of Covid-19 are not captured in this analysis the fact that the DHDA barely achieves commercial sustainability even in the absence of Covid-19 should highlight the potential severe impacts of the global pandemic on the financial position of the agency.

In conclusion, this review has found that option 3 has scored the most favourably on the economic evaluation criteria examined. Option 4 performs less favourably in the quantitative appraisal as a result of the fact that more costs and benefits are taken to be external to the analysis under this option. However, option 4 does have the potential to provide a greater contribution in addressing other market structural imbalances and societal needs beyond the tech sector.

Figure 6.8: Net Annual Surplus / Deficit from Operating Activities (Nominal Values)





Multi-Criteria Analysis

Multi-Criteria Analysis



Multi-Criteria Analysis

In order to ensure that a holistic approach is taken in assessing the options considered in this review, this stage of the analysis will consist of a dedicated Multi-Criteria Analysis (MCA). The purpose of this phase of the analysis is to consider non-quantifiable, i.e. qualitative, factors in a formalised manner through weighted average scoring against a set of pre-defined critical success factors.

The MCA evaluates the options considered under 4 overarching evaluation headings, comprising a total of 11 evaluation criteria. These are as follows:

Strategic policy alignment

- Alignment with government policy
- Addressing the needs of industry
- Addressing market failures
- Supporting welfare and job creation
- Enhancing Ireland’s reputation

Optimal use of location

- Proximity to facilities and institutions that create positive synergies
- Suitability of location for clientele
- Suitability of properties for designated purposes

Impact upon the local community

- Availability of community support programmes for local users
- Enhanced welfare and economic opportunities for local communities

Technical & Planning

- Building space provision, including foreseeable expansion needs

Each option under consideration was judged comparatively against all other options and scored for each evaluation criteria on a scale of 1-5 by the members of the Steering Group established to oversee this review. A guide to this scale is provided on the table opposite.

Each of the evaluation headings within the MCA is reflective of key public policy objectives. Each option is evaluated in terms of these objectives through evaluation against the listed criteria.

While all of the evaluation headings within the MCA are important critical success factors, they are not all equally important. In order to accurately reflect the relative importance of each evaluation heading and to ensure consistency with strategic policy goals each heading has been assigned a specific weighting within the MCA scoring exercise. A table detailing these weightings is provided on the next page. Additional clarifications on each criteria heading are provided in Appendix F.

The MCA exercise was conducted through a structured survey of the members of the Steering Group overseeing the project. The Steering Group was established by DCCAE to oversee the completion of the review. It had membership from the DCCAE; the Department of Public Expenditure and Reform (DPER); the Department of Enterprise, Trade & Employment (DETE); the DHDA; Enterprise Ireland and Grangegorman Development Agency (GDA). The final scoring results were derived using a weighted sum model using pre-defined weightings.

Figure 7.1: Score scaling for Multi Criteria Analysis

1	Meets few strategic objectives within this category
2	Meets some strategic objectives within this category
3	Meets a majority of strategic objectives within this category
4	Meets most strategic objectives within this category
5	Meets all strategic objectives within this category

The advantages of Multi-Criteria Analysis include the capacity to simplify complex situations and rationalise the decision making process.

European Commission



Figure 7.2: Multi Criteria Analysis Headings and Weightings

Criteria	Weighting	Relevance
Strategic Policy Alignment	50%	Alignment with government policy
		Addressing the needs of industry
		Addressing market failures
		Supporting welfare and job creation
		Enhancing Ireland's reputation
Optimal use of location	20%	Proximity to facilities and institutions that create positive synergies
		Suitability of location for clientele
		Suitability of properties for designated purposes
Impact upon local community	20%	Availability of community support programmes for local users
		Enhanced welfare and economic opportunities for local communities
Technical & planning	10%	Building space provision, including foreseeable expansion needs



Multi-Criteria Analysis Findings

Option 3 returns an overall MCA score of 76.2 out of a potential score of 100. Option 2 has the second highest overall MCA result at 59.1, while options 1 and 4 return comparable scores of 44.6 and 49.1 respectively. (See Figure 7.3)

In terms of specific assessment criteria headings, option 3 scored the highest out of all of the options considered under the *Strategic Policy Alignment* heading. (See Figure 7.4 on the next page) Option 3 received a score of 78.6 out of a potential score of 100 under the *Strategic Policy Alignment* heading. By way of comparison, option 2 returned a score of 54.6 under this heading, while options 1 and 4 returned scores of 42.0 and 49.3 respectively. The higher score for option 3 in the *Strategic Policy Alignment* category is attributable to much higher scoring results under the *Addressing the Needs of Industry* and *Addressing Market Failures* sub-headings.

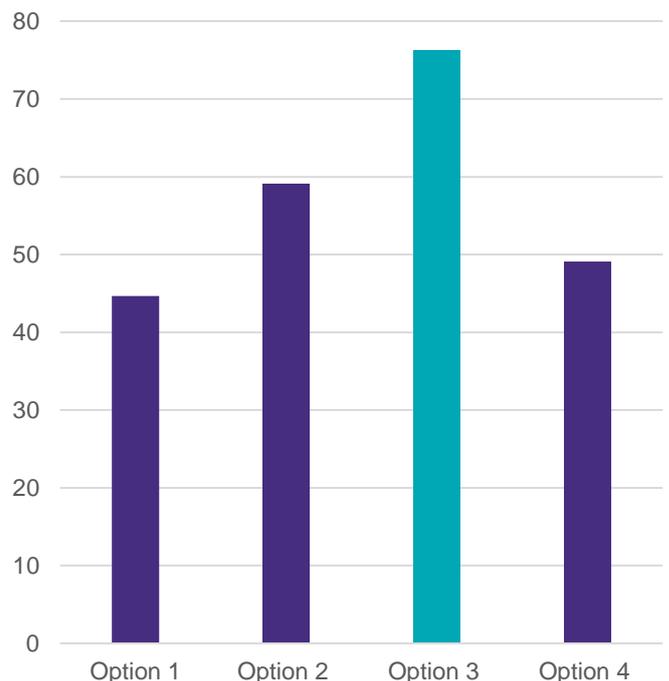
Industry stakeholders engaged as a component of this review expressed a preference for the establishment of an e-health cluster in Dublin. As option 3 provides for the establishment of such a e-health cluster this option has outperformed the other options considered under the *Strategic Policy Alignment* assessment criteria heading.

In terms of the *Optimal Use of Location* criteria heading, option 3 returns the highest result among all options considered. Option 3 returns a result of 77.8 under this criteria heading, as compared to 62.2 for option 2, 53.3 for option 1 and 55.5 for option 4.

The higher result for option 3 under this heading is attributable to the far higher score recorded under the *Proximity to Facilities and Institutions that Create Positive Synergies* sub-heading. The Liberties has advantages as a location for the establishment of an e-health cluster, including the close proximity of multiple major institutions engaged in health practice and health research. As option 3 provides for the establishment of an e-health cluster within the Liberties this option has a comparatively stronger capacity to create positive synergies vis-à-vis such institutions.

In terms of the *Impact Upon Local Community* assessment criteria heading option 3 results in the highest score out of all of the options considered. Option 3 returns a score of 65.0 under this heading, as compared to 63.3 for option 2. (See Figure 7.6) Option 1 and 4 return scores of 45 and 40 respectively under this heading, with each scoring far lower than options 2 or 3 in recognition of the positive contribution that the Digital Hub makes to the local community in the Liberties through its community outreach programmes and the creation of local economic activity and employment. Finally, at 83.3 option 3 score the highest under the *Technical & Planning* assessment criteria heading, while both options 1, 2 and 4 return scores of 40.0, 66.6 and 53.3 respectively. (See Figure 7.7) Option 3 returns the highest overall MCA score, as well as the highest result in all of the assessment criteria categories.

Figure 7.3: Overall MCA Results



Multi-Criteria Analysis

Assessment criteria categories

Figure 7.4: Strategic Policy Alignment

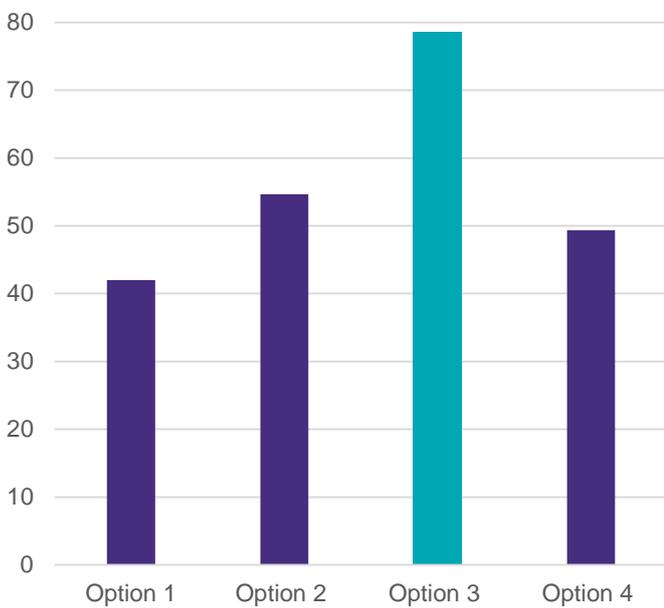


Figure 7.5: Optimal Use of Location

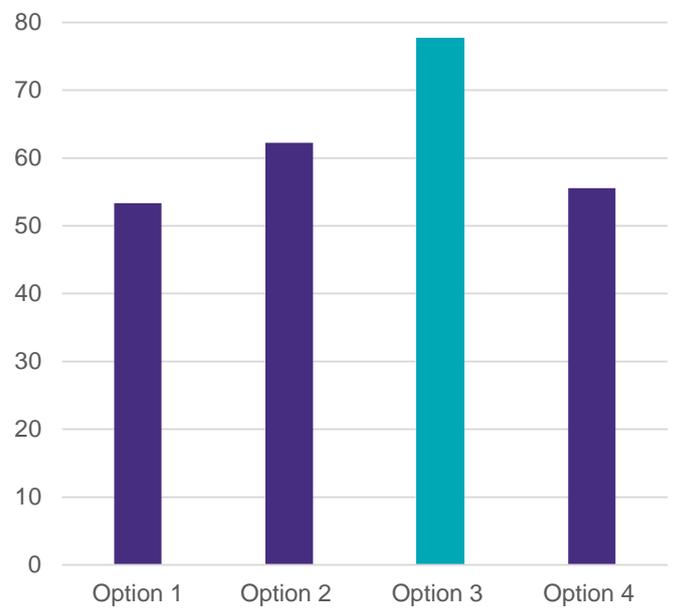


Figure 7.6: Impact Upon Local Community

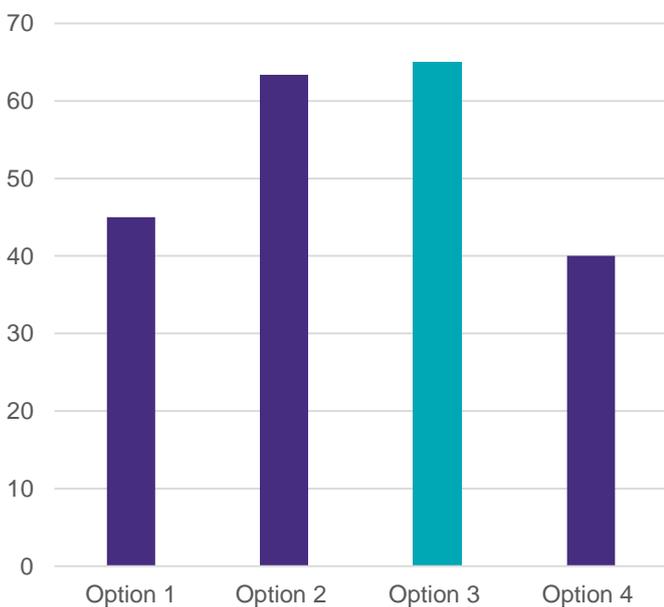
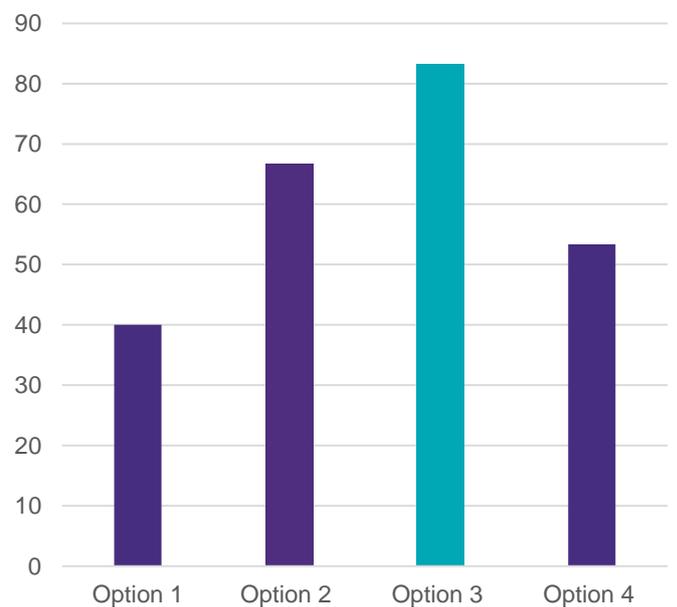


Figure 7.7: Technical & Planning





Conclusions

Conclusions

Conclusions

This strategic review report has been commissioned by the Department of Communications, Climate Action & Environment (DCCA) to inform an assessment of the current rationale for the Digital Hub Development Agency (DHDA) (Phase 1) and to review the effectiveness, efficiency and value for money of the agency through the conduct of a Cost Benefit Analysis (CBA) (Phase 2). This review has included both a comprehensive market gap analysis and an evaluation of a range of options for the future direction of the DHDA. The market gap analysis sought to identify any market failures currently being addressed by the DHDA and to address the question of whether the DHDA is required in order to meet a socio-economic need. **The findings of the market gap analysis were that there is no evidence to suggest that the continued growth of the Irish digital economy is sustained by the services provided by the DHDA.** The Irish digital tech sector is incredibly dynamic and advanced, and Ireland is one of the most innovative and digitally-intensive knowledge economies in the world.

The market gap analysis also found that Dublin's flexible coworking office market has evolved substantially since the initial establishment of the DHDA in 2003. There are currently a large number of coworking enterprise hubs in the Dublin area, many of whom have established new facilities in recent years. More importantly, essentially all other providers of flexible coworking office space in Dublin operate on a commercial basis, i.e. without government subsidisation. In light of the evolution of the Dublin digital ecosystem and coworking office space market there is a strong case to be made against government intervention in the sector. For these reasons, **all of the options considered either dissolve the DHDA or remove the requirement for Exchequer funding of the Digital Hub.**

While the Irish digital economy and Dublin coworking office market cannot be said to be reliant upon the services of the DHDA for their continued growth and dynamism, Dublin's development as a tech hub has been marked by some structural imbalances which are being mitigated by the presence of the Digital Hub. The most notable characteristic of the Dublin coworking office space market has been the concentration of development within the Dublin 2 area and the city's docklands. As a large provider of flexible coworking office space in Dublin 8, the Digital Hub is supportive of Dublin's development as a more balanced and geographically distributed tech hub.

Another noteworthy factor for consideration is that of the comparative price competitiveness of the Digital Hub and Dublin 8 more broadly. The largest private flexible office space service providers active in the Dublin market are significantly more expensive than the Digital Hub. The Digital Hub has come to represent a relatively central option for firms that may find alternative options unaffordable. The Liberties is a generally more affordable location for workers to live when compared to areas such as the Dublin Docklands. This is a particularly salient point with respect to foreign firms. Other European tech hubs such as Berlin, Prague and Lisbon offer flexible coworking space options and an overall cost of living that are more affordable as compared to Dublin's Docklands. By providing a more affordable working and living environment in Dublin 8, the Digital Hub is supportive of Dublin's cost competitiveness as compared to other tech hubs across Europe. While the Digital Hub is mitigating particular structural imbalances that have emerged within the Dublin coworking office market, State subsidisation of the Digital Hub or other forms of State intervention in the market are not necessarily required in order for these effects to be realised.

In light of these considerations and the findings of the market gap analysis all of the options within this analysis have sought to relieve the Exchequer of the requirement to subvent the continued operation and development of the Digital Hub. The Digital Hub achieves commerciality under options 2 and 3, and is dissolved under option 4. Financing for the expansion and redevelopment of the Digital Hub campus under options 2 and 3 is achieved through the exchange of assets within the Digital Hub portfolio in return for in-kind refurbishment of existing properties and new-build offices in partnership with the LDA. Option 2, 3 and 4 are all dependent upon the LDA having access to the requisite levels of financing. The scale of the campus redevelopments that result under options 2 and 3 significantly increase the Digital Hub's future commercial income, making the campus commercially sustainable in both scenarios. The redevelopment of the campus under both options 2 and 3 is also delivered on a market basis, i.e. without the requirement for significant levels of Exchequer funding. Options 2 and 3 remove state subvention of a thriving industrial sector, contribute positively to Dublin's development as a tech hub, while also minimising disruption to businesses and the local community.



Conclusions Contd.

This review has found that option 3 has scored the most favourably on the economic evaluation criteria examined. As option 3 includes the creation of an e-health cluster in parallel to the Digital Hub campus this scenario results in a higher commercial income stream and the creation of a larger industrial cluster. This larger scale and agglomeration of tech firms results in a slightly greater clustering effect, which is additional to that resulting under option 2. Option 3 is also found to be more favourable than option 2 in terms of alignment with government policy and addressing emerging industry needs. Establishing such an e-health cluster within the Liberties would present positive synergies vis-à-vis several other institutions in the locality such as St James Hospital, the National Children's Hospital, Coombe Maternity Hospital and the National College of Art & Design (NCAD). Largely for these reasons, option 3 scored more highly than option 2 within the MCA. **The prospect of establishing an e-health cluster within the Liberties is a proposition which requires additional consideration and further exploration.**

As option 4 envisages the dissolution of the Digital Hub, this option does not address the kinds of market structural imbalances that the Digital Hub currently mitigates. However, **option 4 does have the potential to provide a greater contribution in addressing other market structural imbalances and societal needs beyond the tech sector.** As distinct from options 2 and 3, option 4 is assumed to result in essentially all of the DHDA's assets transferring to other organs of the State. As a result, option 4 would be likely to result in the sites currently occupied by the Digital Hub being repurposed for other societal needs, such as the delivery of social and affordable housing. The vast majority of the costs and benefits that result from option 4 are necessarily taken to be external to the scope of this analysis. This fact explains the comparatively poor performance of option 4 in the economic evaluation component of this review. While option 4 results in the dissolution of the DHDA and the transfer of all of its assets to other organs of the State, this option retains the establishment of an e-health cluster within the Liberties in light of the fact that several industry stakeholders expressed a preference for such an e-health cluster. This analysis does not specify what the governance structure, function or remit of such an e-health cluster might be under either options 3 or 4. It would be possible for such an e-health cluster to exist *within* the Digital Hub or *in parallel* to it under option 3.

A key finding of the stakeholder engagement process undertaken for this review was that such an e-health cluster would be likely to require the availability of sector-specific managerial expertise, research coordination functions and additional enterprise supports above and beyond those currently available to client companies at the Digital Hub. In the event that an e-health cluster were to be established *in parallel* to the Digital Hub under option 3 or in the absence of the Digital Hub under option 4, the issue of the most appropriate governance model for such an e-health cluster would need to be addressed. If an e-health cluster were to be established *within* the Digital Hub under option 3, this may necessitate reforming the remit or service capabilities of the Digital Hub. Industry stakeholders engaged as a component of this review expressed a preference for the establishment of an e-health cluster in Dublin. This proposal requires further exploration and consideration in future.

In conclusion, this review has been undertaken to evaluate the current rationale, effectiveness, efficiency and value for money of the DHDA. This has included both a comprehensive market gap analysis and an evaluation of a range of options for the future direction of the DHDA. The findings of the market gap analysis were that there is no evidence to suggest that the continued growth of the Irish digital economy is sustained by the services provided by the DHDA. For these reasons, all of the options considered either dissolve the DHDA or remove the requirement for Exchequer funding of the Digital Hub. This review has found that option 3 has scored the most favourably on the economic evaluation criteria examined. Option 3 provides the highest stream of benefits over the time horizon of the analysis as well as the more favourable ratio of costs to benefits.

Option 4 performs less favourably in the quantitative appraisal as a result of the fact that more costs and benefits are taken to be external to the analysis under this option. However, option 4 does have the potential to provide a greater contribution in addressing other market structural imbalances and societal needs beyond the tech sector.

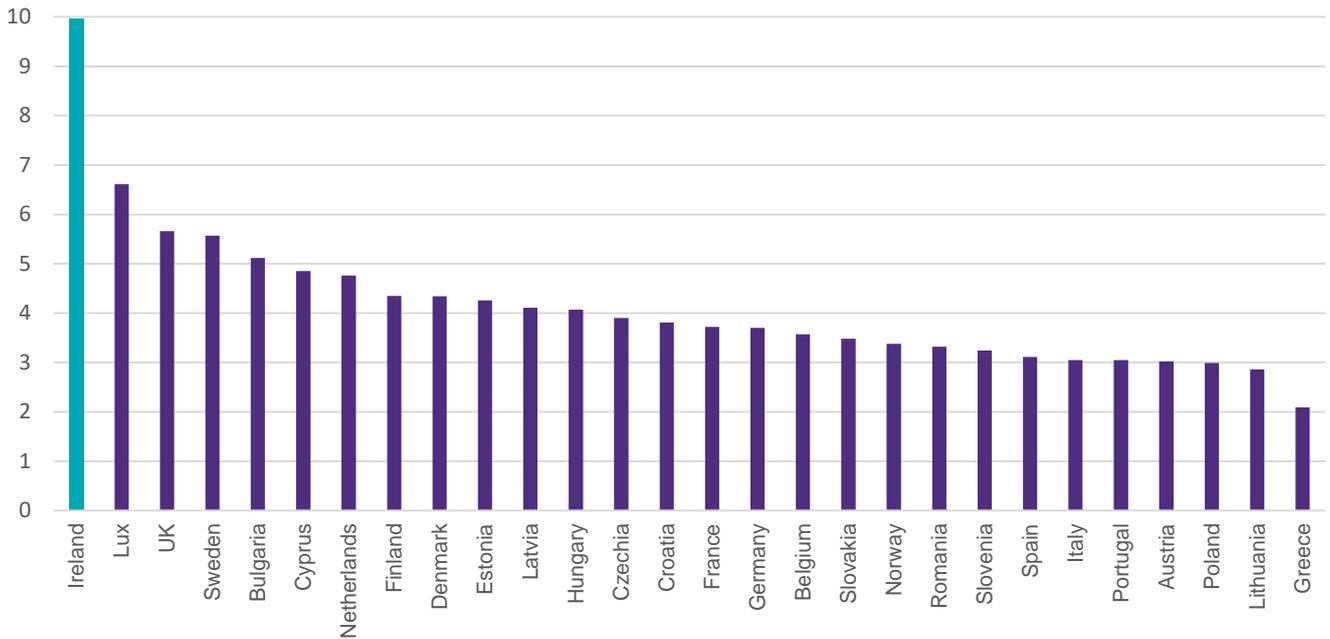
Finally, in the event that the DHDA is ultimately retained the question of the most appropriate future governance model for the agency may be considered by a future Minister.



Appendices

Appendix A: The contribution of the ICT Sector to GDP and Employment

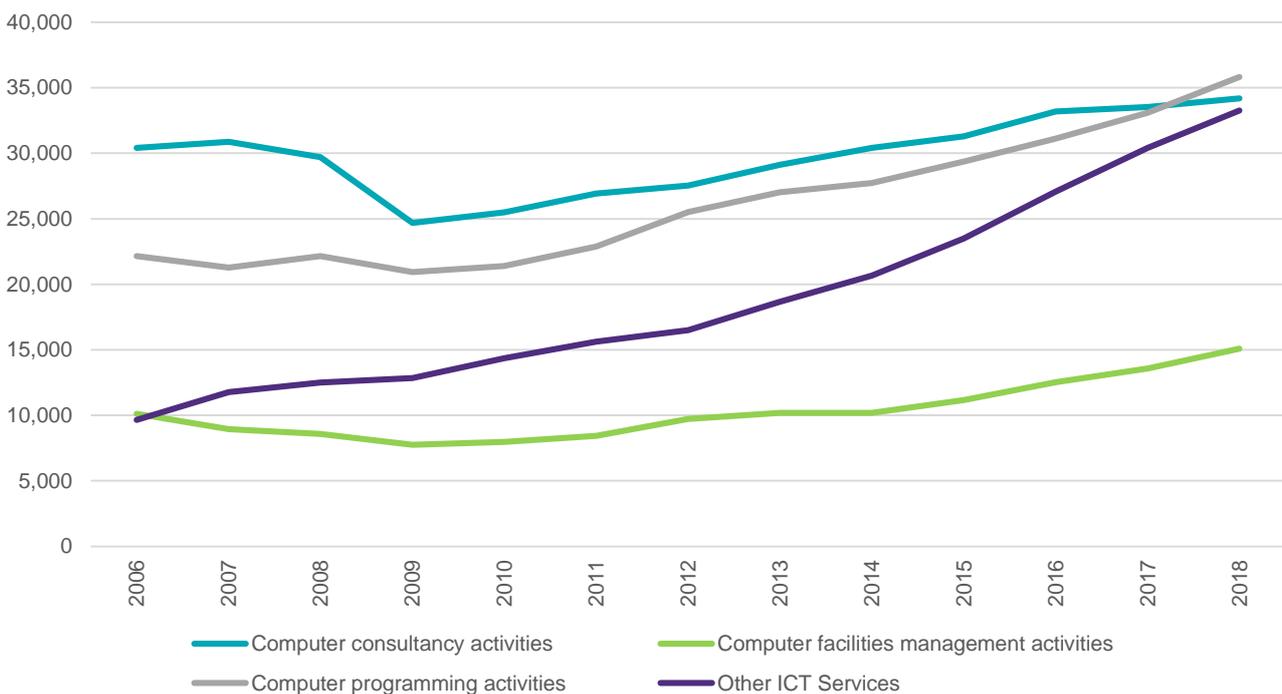
Figure A.1: Contribution of ICT Services Sector to GDP (2016*)



*latest available

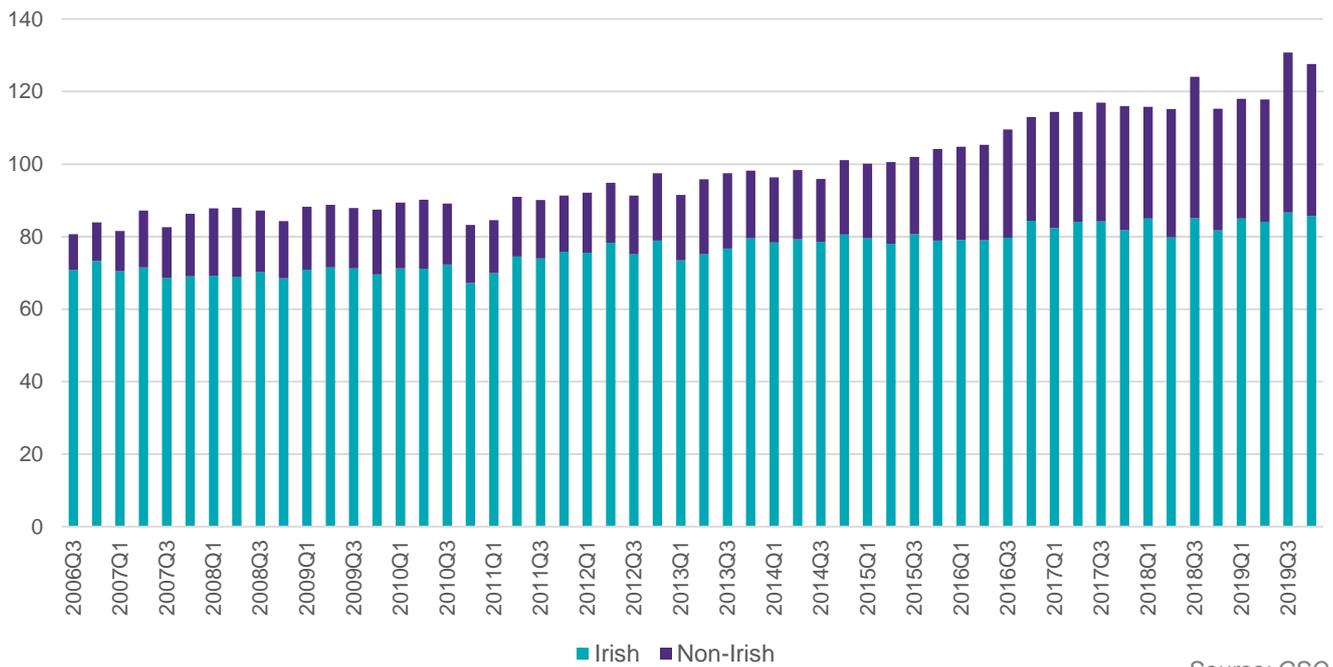
Source: Eurostat

Figure A.2: ICT Services Employment by Activity



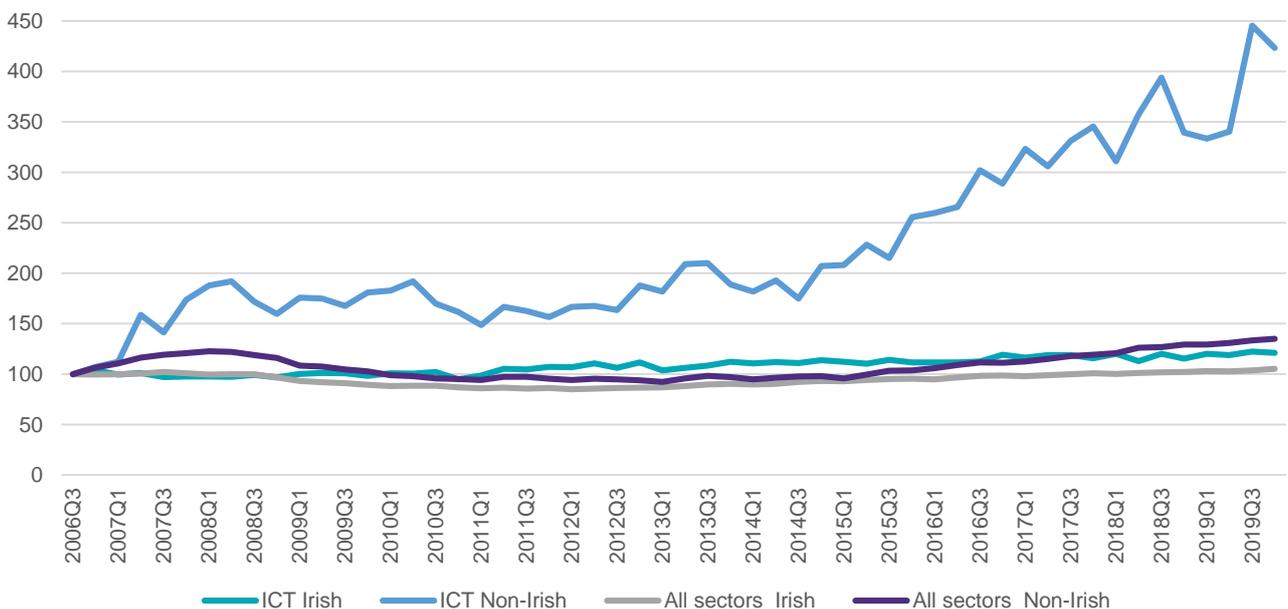
Agency-assisted firms; Source: DBEI

Figure A.3: Persons Employed in the ICT services sector (000s)



Source: CSO

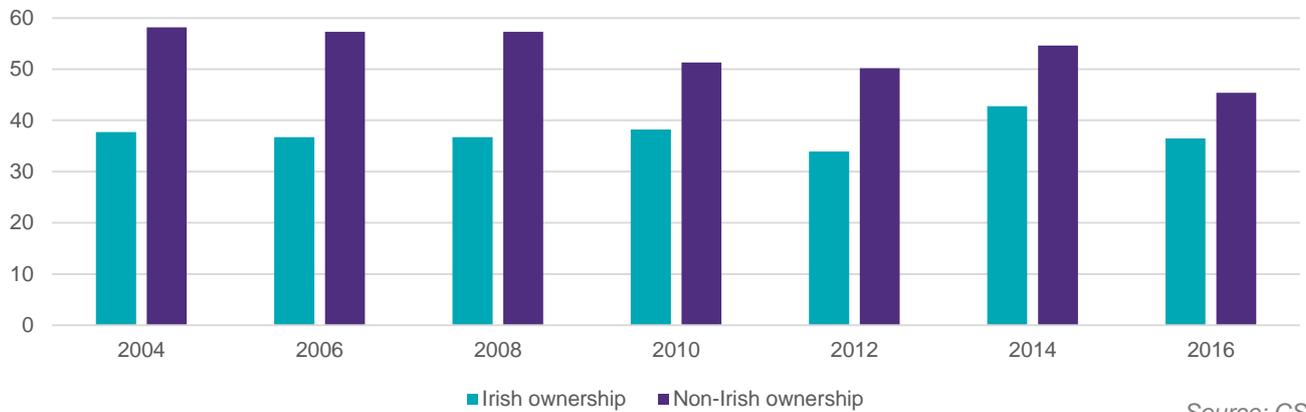
Figure A.4: Persons employed in ICT services and other sectors - Comparative Indices



Source: CSO; GT calculations

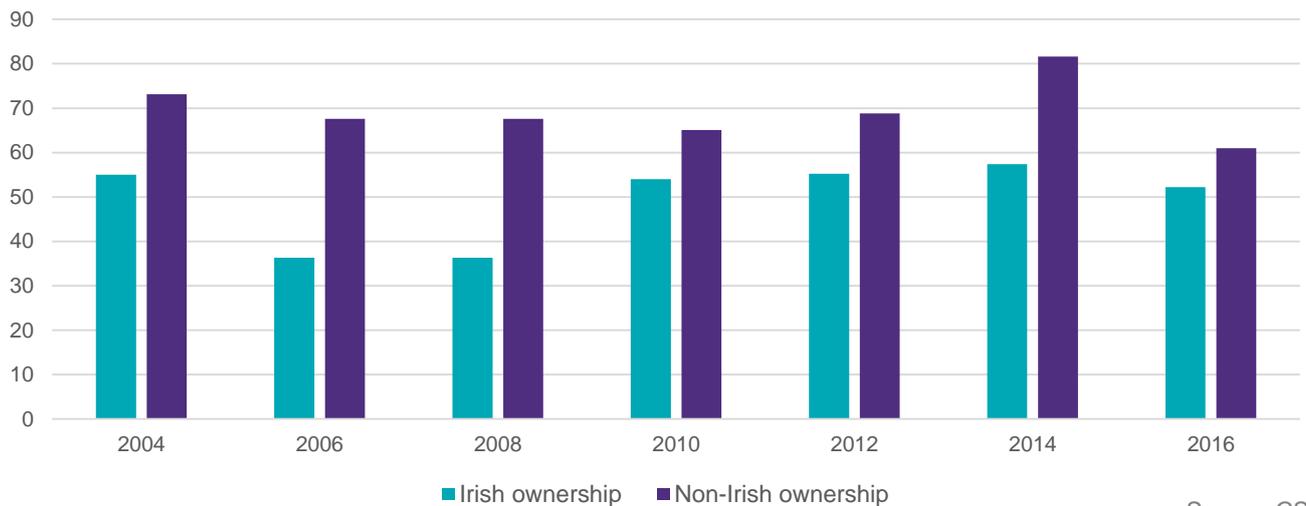
Appendix B: Technological Research & Innovation Activities

Figure B.1: Enterprises that are engaged in technological innovation activities (%) in selected service sectors*



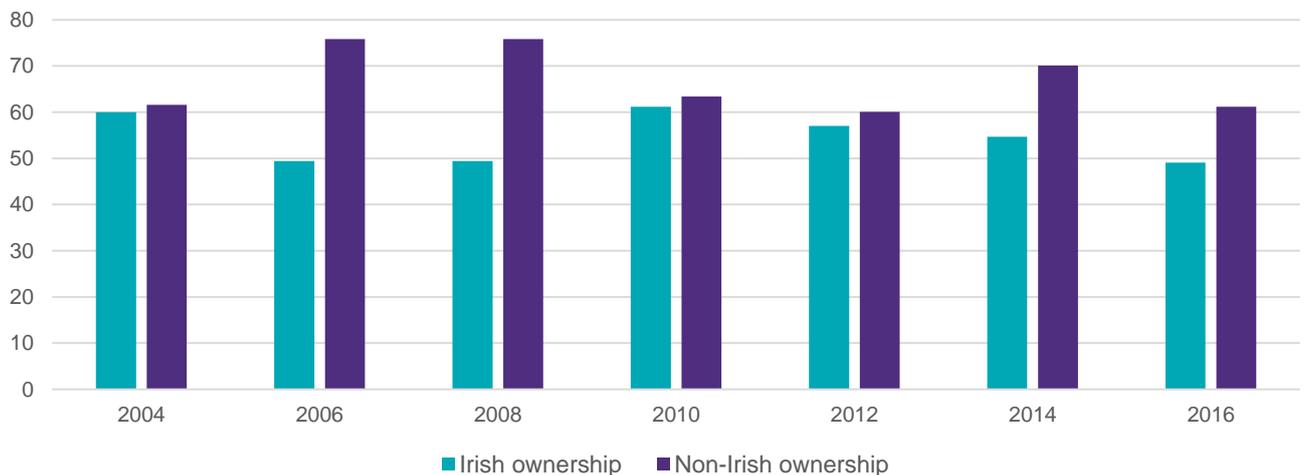
Source: CSO

Figure B.2: Share of turnover generated by enterprises with technological innovation activities (%) by ownership in selected services sectors*



Source: CSO

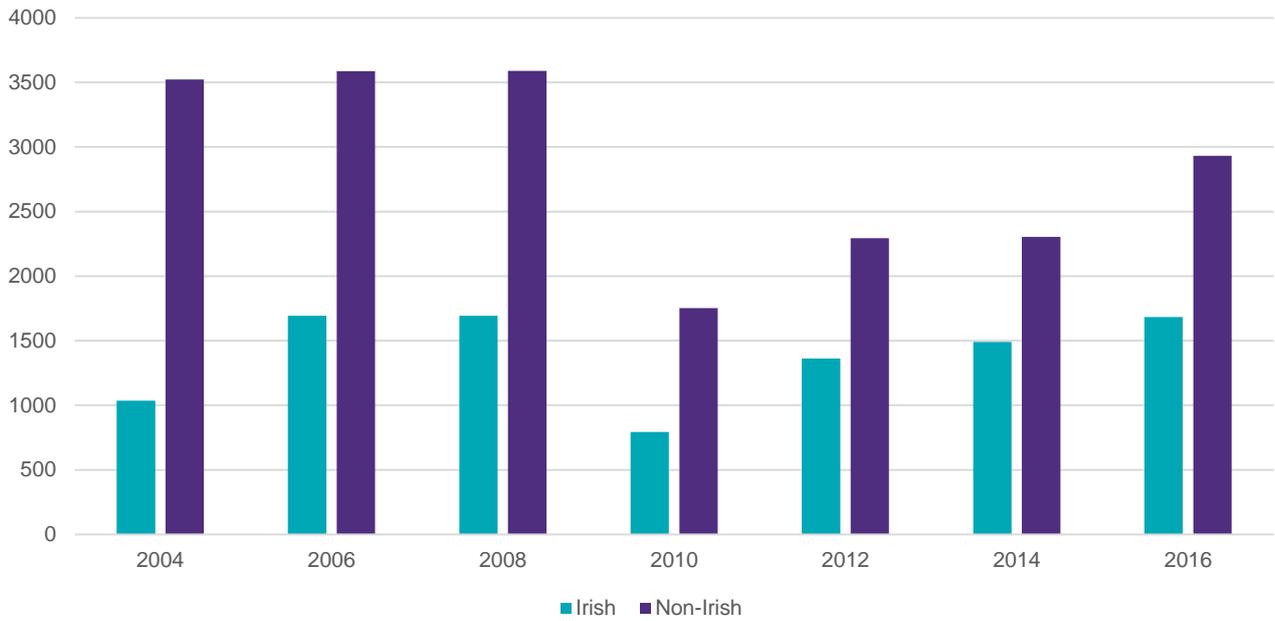
Figure B.3: Persons engaged who work in enterprises with technological innovation activities (%) by ownership in selected services sectors*



*NACE Rev.2: 46, 49-53, 58-63, 64-66, 71-73

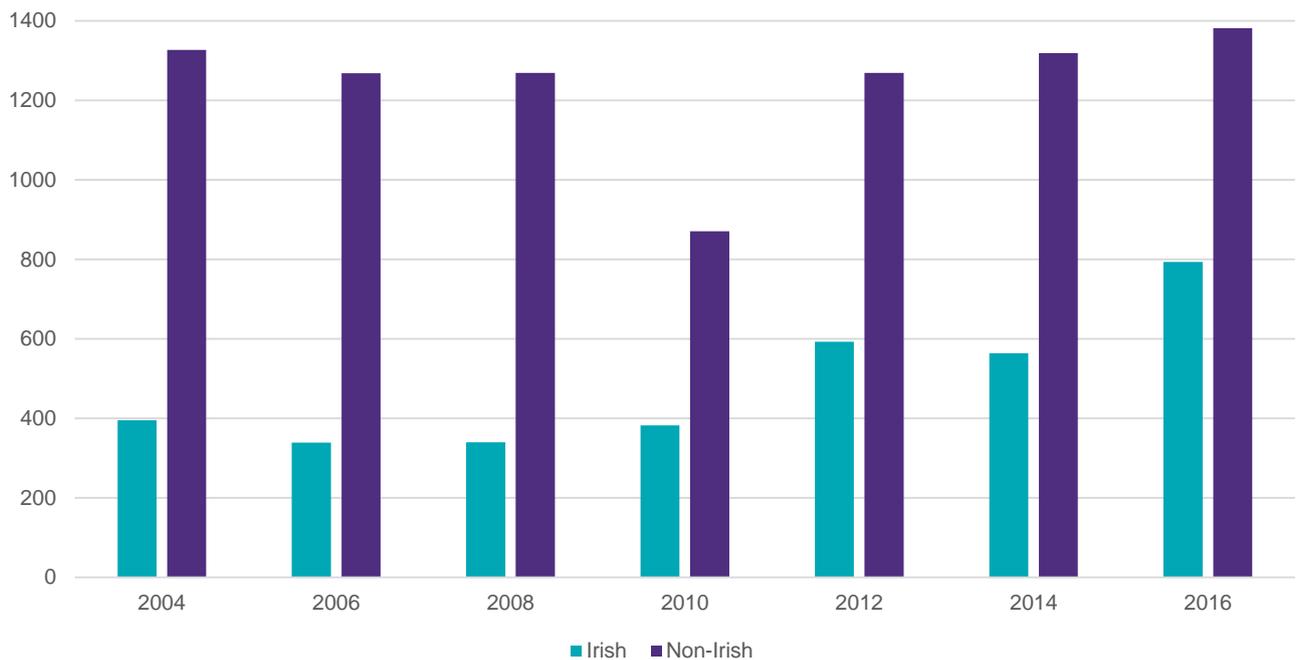
Source: CSO, *latest data available

Figure B.4: Total Expenditure on Innovation (€m)



Source: CSO

Figure B.5: Innovation Expenditure on In-House R&D (€m)

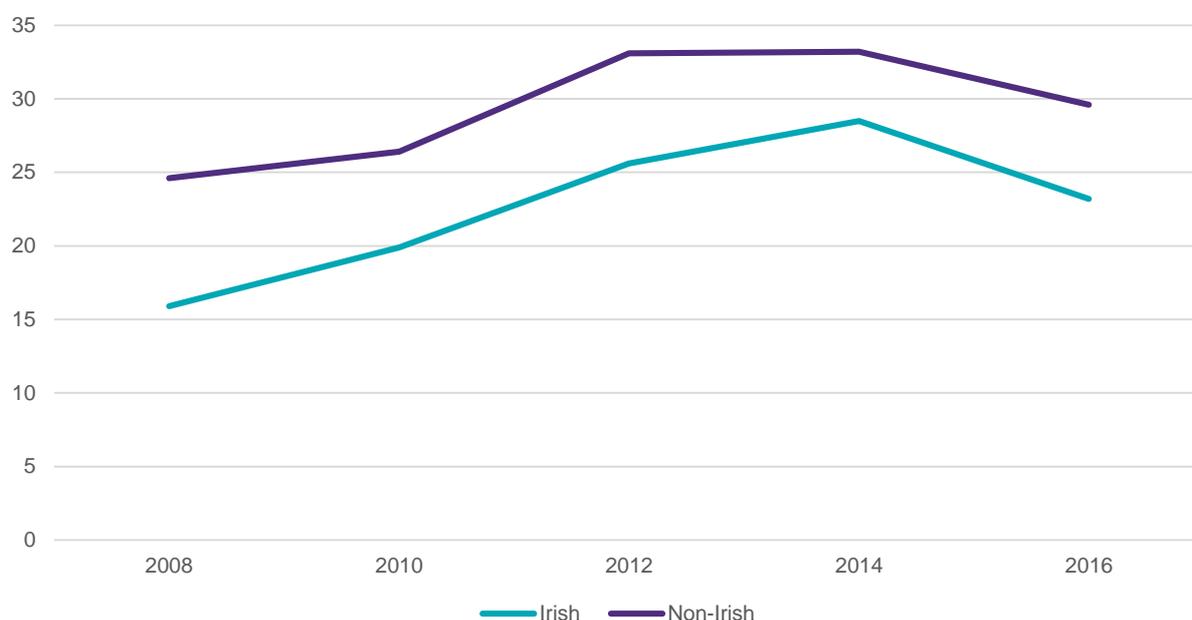


Source: CSO

Industry and Selected Services sectors*

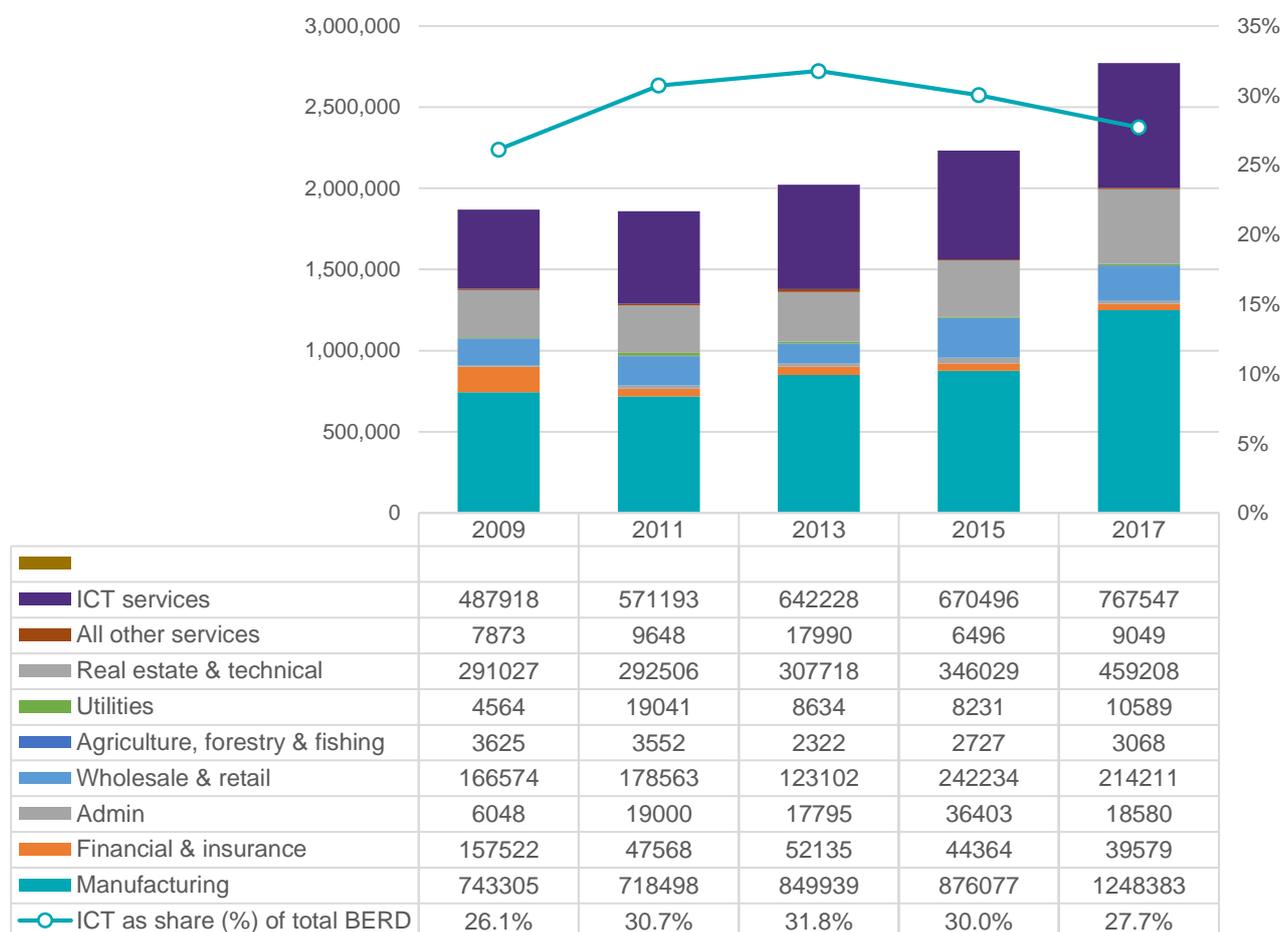
*NACE Rev 2: 5-9, 10-33, 35, 36-39, 46, 49-53, 58-83, 64-66, 71-73

Figure B.6: Share of enterprises (%) engaged in In-House R&D 2016



Source: CSO

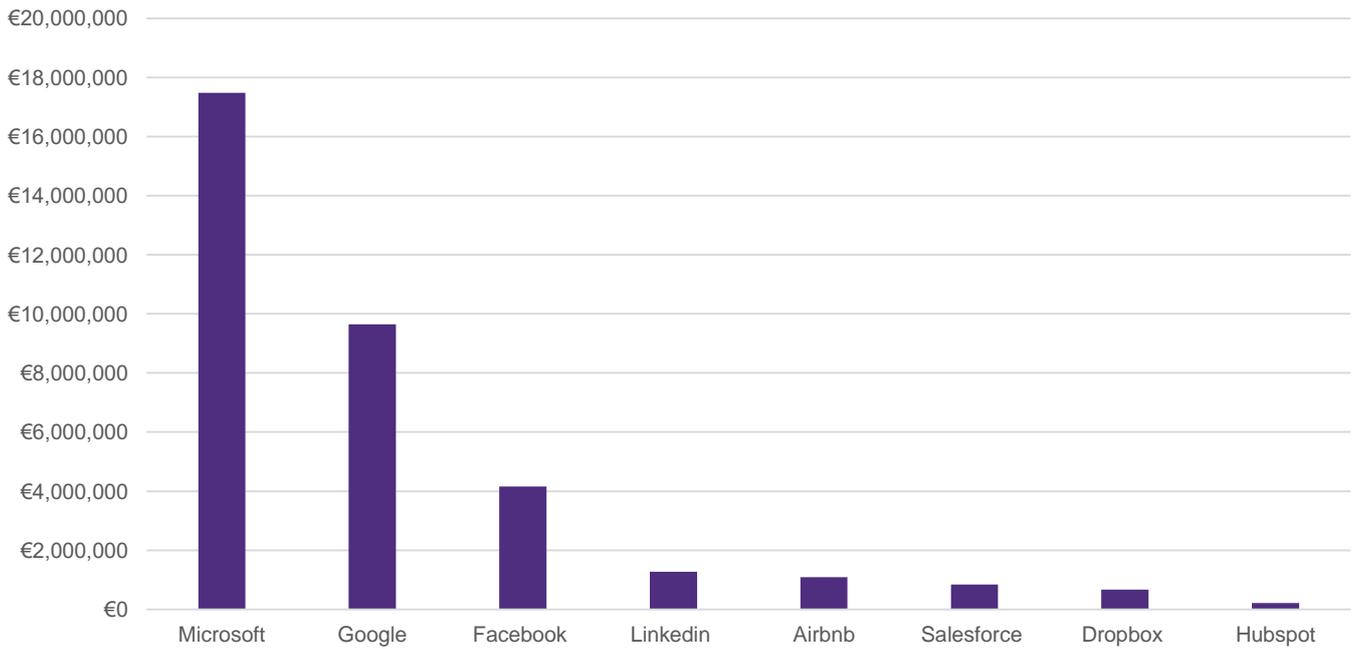
Figure B.7: Business Expenditure on R&D (€000s) and ICT share (%)



Source: CSO

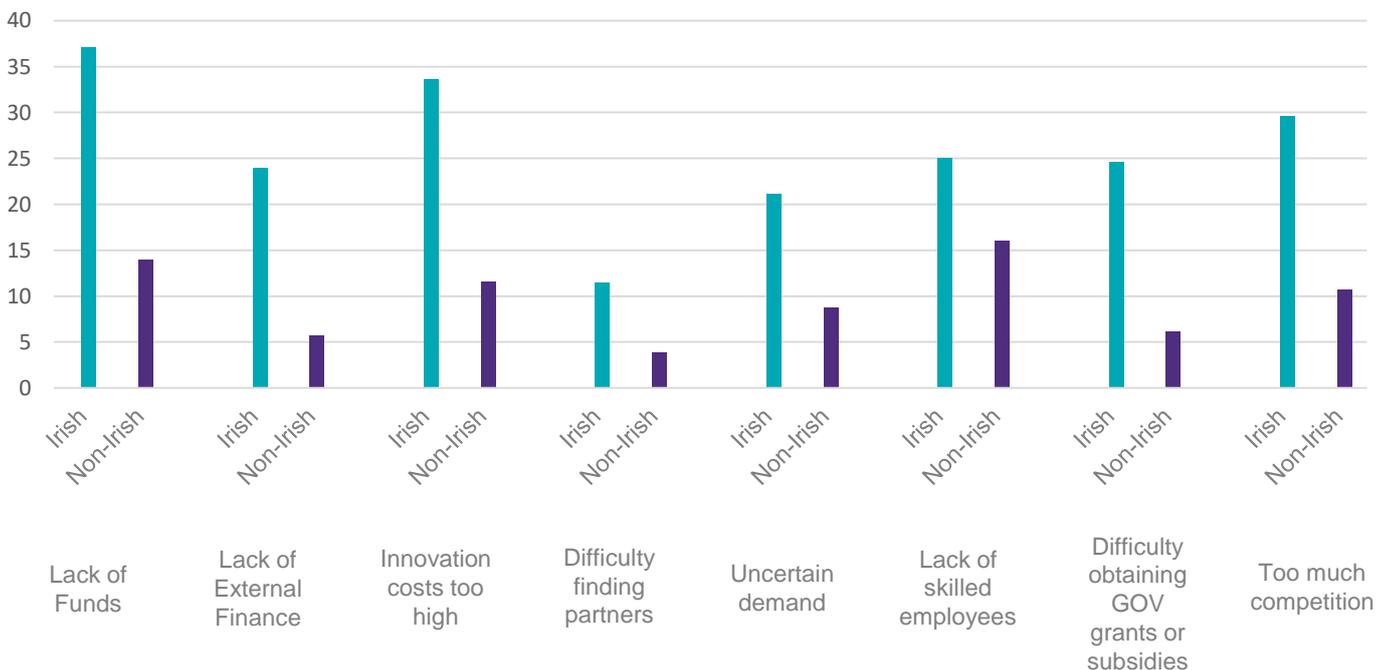
Appendix C: Comparative cost sensitivity of Irish tech SMEs

Figure C.1: Turnover per employee of Irish operations



Source: Lisney

Figure C.2: Experience of Factors Hampering Innovation Activities (% of firms) 2016



Industry and Selected Services sectors*

*NACE Rev 2: 5-9, 10-33, 35, 36-39, 46, 49-53, 58-83, 64-66, 71-73

Source: CSO

Appendix D: Effect of cluster size on productivity

$$\ln y_{ijfkt} = \alpha \ln S_{-ifct} + d_{cf} + d_{ck} + d_{ft} + d_{kt} + d_{ct} + d_i + d_j + u_{ijfkt}$$

y_{ijfkt}	Number of patents produced in year t by inventor i working in firm j in research field f , technology class k and located in city c
t	year
i	inventor
f	field
k	technology class
c	city
S_{-ifct}	The size of the cluster in the relevant field, city and year, excluding inventor i
d_{cf}	city x field
d_{ck}	city x class effects
d_{ft}	field x year
d_{kt}	technology class x year effects
d_{ct}	city x year effects
d_i	inventor effects
d_j	firm effects

Figure D.1: Effect of cluster size on inventor productivity – Baseline Models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Size	0.0514 (0.00812)	0.0751 (0.0166)	0.0870 (0.0186)	0.0897 (0.00924)	0.0668 (0.00861)	0.0910 (0.00980)	0.0514 (0.0116)	0.0662 (0.0138)
N	932008	932008	932008	932008	932008	932008	932008	823359
Year	y	y	y	y	y	y	y	y
City	y	y	y	y	y	y	y	y
Field	y	y	y	y	y	y	y	y
Class	y	y	y	y	y	y	y	y
City x Field		y	y	y	y	y	y	y
City x Class			y	y	y	y	y	y
Field x Year				y	y	y	y	y
Class x Year					y	y	y	y
Inventor						y	y	y
City x Year							y	y
Firm								y

Each column is a separate regression. The level of observation in the regressions is inventor-year. The dependent variable is log of number of patents filed in a year. The model estimated is the equation above. Standard errors are city x research field.

Source: Moretti 2019 pp.35

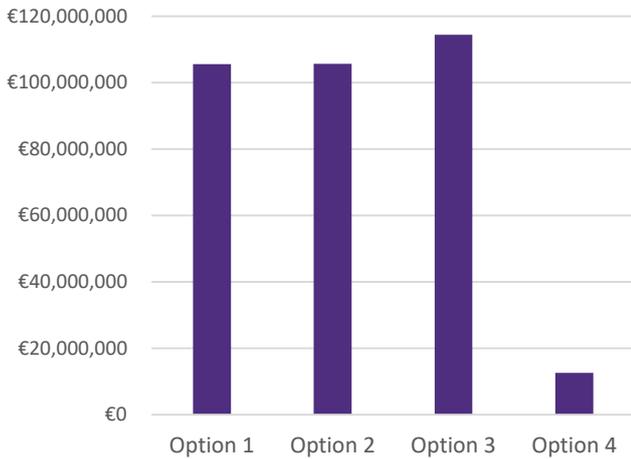
Figure D.2: Effect of cluster size on inventor productivity – OLS and IV Estimates

	OLS	OLS	OLS	OLS	OLS	OLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
log Size	0.014 4	0.014 8	0.015 6	0.0169	0.0167	0.0162	0.0291	0.0475	0.0345	0.0315	0.0310	0.0307
	(0.002 55)	(0.00 256)	(0.00 258)	(0.002 80)	(0.002 76)	(0.002 77)	(0.012 0)	(0.014 4)	(0.014 1)	(0.012 0)	(0.012 1)	(0.012 2)
First Stage							0.983	0.948	0.965	1.238	1.272	1.278
							(0.0345)	(0.0495)	(0.050 0)	(0.065 3)	0.0644	0.0650
P-value	0.212	0.025	0.183	0.217	0.235	0.235						
F Stat.							811.90	366.14	372.73	358.91	390.60	386.49
N	41959 9	41959 9	4195 68	40509 5	405095	403942	419599	419599	419568	405095	405095	403942
Year	y	y	y	y	y	y	y	y	y	y	y	Y
Field		y	y	y	y	y		y	y	y	y	Y
Class			y	y	y	y			y	y	y	Y
Firm				y	y	y				y	y	y
Field x Year					y	y					y	y
Class x Year						y						y

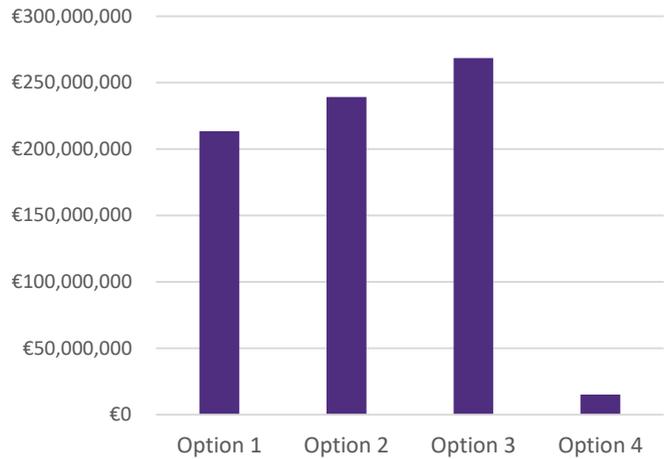
Source: Moretti 2019 pp.38

Appendix E: Summary of key costs & benefits (2020-2040) - Present Values

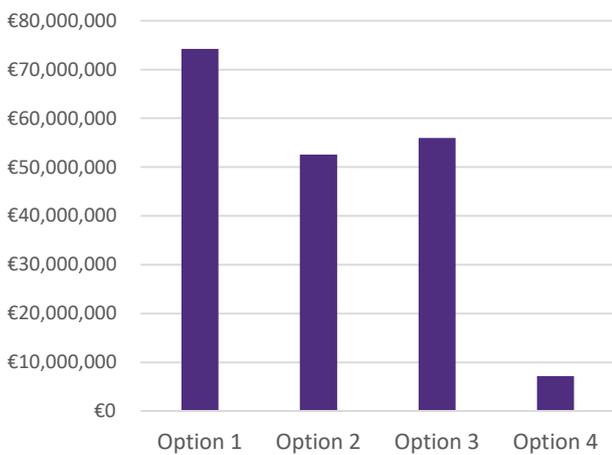
Total Costs



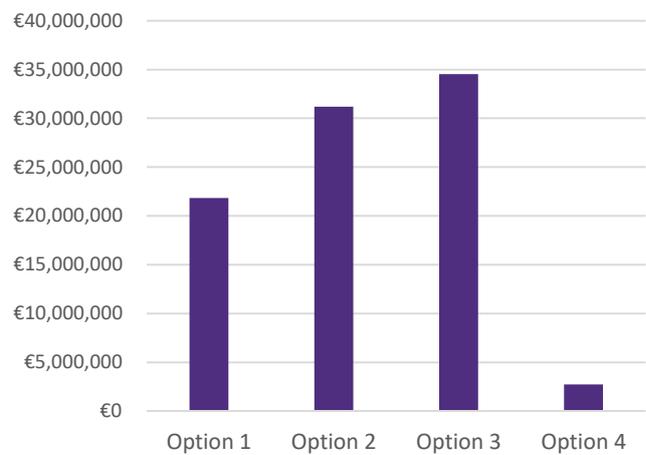
Total Benefits



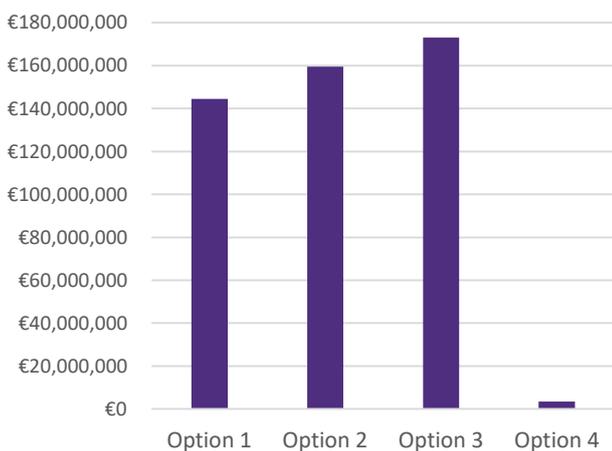
Operational Costs



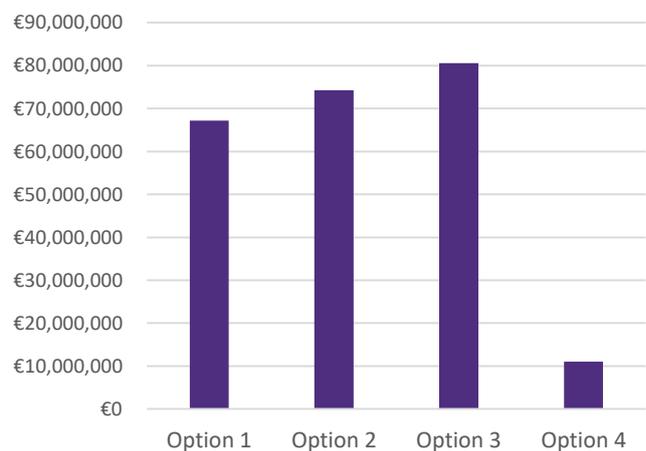
Capex Costs



Clustering Effect GVA Uplift



Commercial Income



Key Assumptions

Key assumptions		
	Option	Description
Capex Costs	2, 3, 4	<ul style="list-style-type: none"> Capital investment costs are estimated on the basis of the quantum of floorspace delivered under each option, assuming that these costs rise and fall in proportion to the costs of the VAT-house 7 redevelopment costs.
Operational Costs	1, 2, 3, 4	<ul style="list-style-type: none"> Annual operating expenses are estimated on the basis of the quantum of floorspace delivered under each option, assuming these costs rise and fall in proportion to DHDA's current operating costs.
Periodic Maintenance Costs	1	<ul style="list-style-type: none"> Periodic maintenance costs are assumed to be higher under option 1 as this option results in the continued use of existing properties within the DHDA portfolio which are currently approaching the end of their useful life.
Vacant Site Levy	1	<ul style="list-style-type: none"> Option 1 is assumed to result in Vacant Site Levy charges that do not arise under the other options. This calculation excludes the VAT-house 7 property due to its eventual redevelopment.
Commercial Income	1, 2, 3, 4	<ul style="list-style-type: none"> Future commercial income is estimated on the basis of the quantum of floorspace delivered under each option considered.
Residual Value	1, 2, 3, 4	<ul style="list-style-type: none"> Residual value calculations assume straight-line depreciation. The residual value calculations assume the properties developed have a useful life of 50 years.

Appendix F: Multi Criteria Headings, Weightings and Clarifications

Multi Criteria Analysis Headings and Weightings			
<p>All responses to the MCA should evaluate each option while considering:</p> <ul style="list-style-type: none"> • The goals and objectives of government policy as a whole • The needs of industry as a whole • The needs of society as a whole • Outcomes associated with the transfer of assets to the LDA should be considered where applicable 			
Criteria	Weighting	Relevance	Additional clarifications
Strategic Policy Alignment	50%	Alignment with government policy	<ul style="list-style-type: none"> • Consider the full spectrum of government strategic policy goals including enterprise development, digital policy, housing policy, spatial planning, urban regeneration, community development etc.
		Addressing the needs of industry	<ul style="list-style-type: none"> • Consider the needs of all potentially relevant industrial sectors including digital tech, e-health, construction, retail etc.
		Addressing market failures	<ul style="list-style-type: none"> • Consider all potentially relevant markets including digital services, e-health services, flexible coworking office space, construction, retail etc.
		Supporting welfare and job creation	<ul style="list-style-type: none"> • Consider welfare and job creation outcomes in broad terms across all economic sectors
		Enhancing Ireland's reputation	<ul style="list-style-type: none"> • Evaluate the options in terms of their impact upon Ireland's overall international reputation
Optimal use of location	20%	Proximity to facilities and institutions that create positive synergies	<ul style="list-style-type: none"> • Consider how each option will result in positive outcomes due to close proximity to other facilities and institutions
		Suitability of location for clientele	<ul style="list-style-type: none"> • Consider the suitability of the location for the clientele that occupy the facilities created for each development option
		Suitability of properties for designated purposes	<ul style="list-style-type: none"> • Consider the suitability of properties for the purposes resulting under the options considered
Impact upon local community	20%	Availability of community support programmes for local users	<ul style="list-style-type: none"> • Evaluate each option in terms of their impact upon the availability of community support programmes in the Liberties
		Enhanced welfare and economic opportunities for local communities	<ul style="list-style-type: none"> • Consider welfare and economic opportunities for local community residents resulting from each option considered
Technical & planning	10%	Building space provision, including foreseeable expansion needs	<ul style="list-style-type: none"> • Availability of adequate building space to deliver facilities envisaged under each option, including potential future expansion needs • Evaluate each option in terms of ease-of-delivery with respect to technical and planning issues

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