Measuring the regional digital economy: A pilot information and communication technology (ICT) satellite account for Wales

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March 2022

This project is funded by ONS Research Fund

Introduction

The project is focused on measuring the impact of overall supply and demand of Information and communication technology (ICT) products and services in Wales, in terms of the direct aggregate contributions to employment and Gross Value Added for the regional economy of Wales in 2018, which provides economic intelligence for public policymaking and adding public knowledge. From the national account development point of view, this project contributes to the approach development of satellite account, not only to Wales or UK, but to a much wider community as there are currently few countries around the world could develop an ICT satellite account.

An ICT satellite account is based on the Input-output framework with more detailed pre-defined ICT specific sectors in addition to other sectors. It provides insights on the supply and demand of ICT products and services of a nation or region across all sectors, and most importantly with ICT ratios or dependency for each industry in the economy estimated by the reconciliation of ICT supply and demand. Despite the supply of some ICT products and services in Wales could be roughly derived from publicly available data, the demand and supply of the specific categories of ICT products and services in Wales are not available publicly. More importantly, the hidden supply and demand of ICT products and services from other non-ICT industries need to be effectively measured given the penetration of ICT across the whole economy nowadays. Therefore, a methodologically coherent and comprehensive way to measure such contributions of the ICT products and services in a region/nation is to develop an ICT satellite account. Making good use of advantageous data sources available for the region, from ONS SRS or public data, and other very useful data source from WERU, was the additional reason of carrying out this project.

Literature of information and communication technologies

Information and communication technologies (ICTs) are the new infrastructure that supports the daily running and development for both frontier economies and transitional economies. The annual expenditure on ICTs in developing and transitional economies is more than $800bn (Heeks, 2009), which is approximately equivalent as Switzerland's GDP in 2021. The ICT products and services have become increasingly important in the contemporary society (Arushanyan et.al, 2014). Studies have been done at various sectors to emphasise the importance of ICT products and services, such as the importance of ICT on enhancing agriculture sector production has been highlighted, studies have suggested that through adoption and utilization of new technologies, not only the sector production could be enhanced, but also the tools in getting the most updated agricultural knowledge and skills especially in remote areas are provided (Chavula, 2014; Nkasone, 2014).

Business sector makes significant economic and social contribution to the country it operates in regardless of its size (Wolf, 2001). ICTs are seen as one of the key factors that's driven the growth of firms and the business sector, it has been vital in supporting the growth of business sector by being good source of change and enabler of advancement in business sector. The ICT tools are treated as bedrock for the sector's growth (Apiyo & Kiarie, 2018; Billon, Marco, & Lera-Lopez, 2017; Cirera, Lage, & Sabetti, 2016; Grazzi & Jung, 2015; United Republic of Tanzania [URT], 2016). ICT is found as a source of innovation to find solutions for competitive development of businesses (Franco and Garcia, 2017). It provides opportunities for performance improvements, markets expanding. The adoption of such ICTs increases the opportunity for firms to be innovative in processes handling and products management. It also facilitates the application of other technologies and serves as a basis so that various business models could function properly (Grazzi & Jung, 2015; Diaz-Chao, 2015; Franco & Garcia, 2017; Cirera et al., 2016).

Avgerou (2013) offers an explanation that within existing social and environmental conditions and arrangements in New Zealand, ICT use contributes to refugees' social inclusion, the explanation has sufficient generality to be useful in other contexts. Joyce et. al (2019) used Multi-Regional Input Output analysis to investigate the consumption trends, environmental and social impacts of ICT products in Sweden and the EU, they found that ICT spending is linked to prosperity, 2008 financial crisis caused a clear fall of ICT spending but followed by a recovery since (Joyce et. al, 2019)

ICTs is also crucial to economic activities at national or regional level, it enhances productivity and accelerates economic growth, innovations inspired by ICTs improve economies' total factor productivity, digital investment is often accompanied by human capital investment and organizations structural change, therefore, return rates on digital investment is often higher than it is on physical investment (Jorgenson & Vu, 2007) for two reasons. First, ICTs directly increase productivity and boost economic growth (Jorgenson, Ho, & Stiroh, 2008; Ceccobelli, Gitto, & Mancuso, 2012; Jorgenson, Ho, & Samuels, 2011; Kunz, Schmitt, & Meyer, 2011). Productivity in Europe and US diverged during the mid-1990s lasting until the mid-2000s, this may largely be a result of strong investments in ICTs in US. ICT often serves as the enabling technologies and facilitates further innovations, much of the productivity improvements were originated in industries that supplied and applied ICT intensively in the US, capital intensity of ICT in Europe began to fall behind while US productivity growth was increasing rapidly (Cardona et al., 2013).

The adoption of ICT is recognized as a necessity to foster productivity growth. Different countries have various strategies to boast the positive impact of ICTs adoptions. The following are a few examples of the national or regional strategies in promoting the adoption of ICTs,

- "American Recovery and Reinvestment Act", launched in 2009 in US, is the stimulus package that invests $7.2 bn in broadband and wireless internet access, a further $290 m is granted to upgrade IT platforms at the State Department to reshape US economy to compete in the digital age.

- The Digital Agenda by European Commission targeted that at least 50% of European households subscribing to internet has a broadband speed exceeds 100 Mbps by 2020 (Cardona et al., 2013).
- The government of Tanzania has policy and strategies in place to stipulate ICTs as a driving force in social-economic growth across all the sectors within the economy (URT, 2016), including broadband penetration, ICT security, efficiency in e-service and business, etc., those initiatives form as part of the National Strategy for Economic Growth and Poverty Reduction (NSEGPR) and National Development Vision 2025 objectives in Tanzania (URT, 2005).
- Welsh Government's £425 million Superfast Cymru project, part-funded by the European Regional Development Fund (ERDF) launched in 2013, aimed to ensure that 96% of premises in Wales have access to superfast broadband by the end of 2017 (Welsh Audit Office, 2015).

Reasons of Satellite Account approach

From the beginning of the digital economy, utilization of ICTs has affected how firms produce and provide goods and services. While majority of the studies have shown that ICT is positively and significantly affecting firm's productivity, methodological approaches in appropriately estimating the ICT effect matter. Cardona et.al (2013) provided an overview of the empirical literature on ICT and productivity, it highlighted the methodological and results differences across different studies in the literature. The aggregate and sectoral growth suggest stronger differences, firm-level analyses suggest no significant country differences between US and Europe.

A measurement that is consistent with System of National Accounts (SNA) may be meaningful, because it is more comparable across sectors, most importantly, it is able to effectively measure ICTs penetration across all sectors. Satellite accounts provide a framework that is linked to central account at national or regional level, allowing attention to be focused on a certain field of national accounts; common examples are satellite accounts for the environment or tourism (Eurostat, 2019).

There have been a few ICT satellite account frameworks proposed earlier (see Ribarsky, 2018; Statistics South Africa, 2012; Federal statistical office of Germany; 2007), however, due to data limitations and more functional and details attained by the satellite framework proposed in this study, the ICT satellite account framework proposed is preferred for this project.

Methodology

There are similarities between ICT industries and tourism industries for their penetration across almost all the industries across all the economy. Therefore, the well-developed tourism satellite account framework is adopted in this study to measure the overall economic impact of ICTs in the economy. Tourism is a complex part of economic demand, covering many established industry sectors, it is invisible in systems of national accounts (SNA). TSA is established to measure the economic contribution of tourism in ways consistent and compliant with existing SNA. In order to make the measurement of the aggregated number of tourism-related activities in the whole economy, one has to identify each existing industrial sector and search for the number of tourism-related consumptions 'hidden' in the sales of these industrial sectors. TSA is thus not a model of economic activity but an accounting to record tourism supply/demand direct (annual) value (Hara 2008).

TSA links and reconciles tourism products supply and demand; it provides similar definitions and approaches to those used to measure other economic activity. Therefore, TSA provides the possibility of comparing tourism with other areas of economic activity by its economic contribution. The standards to distinguish the TSA from other tourism measurement systems are as following (UNWTO 2008),

- It elaborates the interconnected tables as accounts, which are consistent with the supply and use tables of SNA;
- It excludes indirect, induced and multiplier effects of tourism and only limits measurement to the direct economic contributions.
- The data of the specific Tourism Characteristic Products and the conventionally defined Industries producing these products.
- It presents four main macroeconomic aggregates: Internal Tourism Expenditure, Internal Tourism Consumption, Tourism Direct Gross Value Added and Tourism Gross Domestic Product.

This project aims to construct the ICT satellite account that mirrors the well-developed satellite account framework of TSA with the same standards applied and explained above (United Nations et.al., 2008). The first stage of this project is to compile Wales input output use tables 2018, in both combined use and domestic use form. The 2 detailed use tables serve as a basis for drawing supply and demand information for ICT products and services. The next stage is to compile the ICT satellite account tables, in terms of total ICT GDP and GVA by industry, trade by products and by industry, consumption of ICT specialized products and services by both ICT specialized industries and all other industries. Followed by reconciliation between the internal consumption of such ICT specialized products and services versus total industry supply in the region to estimate ICT ratios of ICT specialized industries and all other industries. Finally estimate how much employment and GVA are directly contributed by such ICT products and services' production and consumption in the region.

Data

ONS Secure Research Services (SRS) datasets requested

(Datasets' study number and full title)

- SN 7451 Annual Business Survey (previously known as Annual Business Inquiry - ABI)
- SN 8558 Annual Purchases Survey - UK
- SN 6729 UK Manufacturers' Sales by Product Survey
- SN 6690 Business Enterprise Research and Development
- SN 6697 Business Structure Database
- SN6700 E-commerce Survey
- SN 6711 International Trade in Services
- SN 7047 Living Costs and Food Survey (Expenditure and Food Survey)
- SN 7882 Quarterly Acquisitions and Disposals of Capital Assets Survey
- SN 8873 Services turnover in the UK (also known as Annual Survey of Goods and Services)

https://ukdataservice.ac.uk/

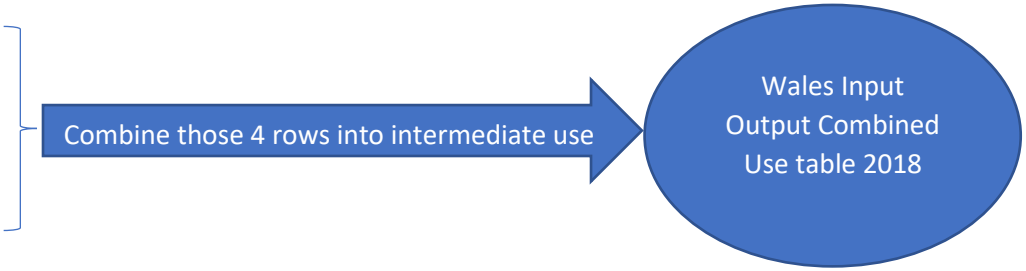
Public datasets

- ONS regional accounts
- StatsWales data
- UK SUT 2018
- Scotland SUT 2018
- Wales IO table 2019
- Business Register and Employment Survey data
- Digital maturity survey 2017-2020 by Welsh Economy Research Unit (WERU)
- Other earlier data available to the WERU

Analysis and results

Wales Input Output Use table 2018 methodology

Industry			Final demand										
Product	Domestic intermediate use at basic prices	Total intermediate use at basic prices	Household	NPISH	Government	GFCF	Changes in Inventories	Valuables	Exports - RUK	Exports - RoW	Total final demand	Tax less subsidy on intermediate use	Total intermediate use at purchase price
Total domestic use at basic prices													
Import RUK													
Import RoW													
Tax less subsidy on products													
Total combined intermediate use at purchaser prices													
Taxes less subsidies on production													
Compensation of employees													
Gross operating surplus													
Gross value added at purchaser prices													
Total output at purchaser prices													



Construction of Initial Combined Use Table

ABS (Annual Business Survey) is one of the main surveys to draw industry total turnover, GVA, and output. Industry (column total) is in 2-digit Standard Industry Classification (SIC) for the first instance, additional 4 digit SIC ICT related industry category is added where needed and possible according to OECD ICT products and services guide (OECD Publishing, 2011), which is further restricted by data availability at the specified ICT industry level.

Data on purchase details of goods and services (providing us the total intermediate consumption by industry) are available from the **Annual Purchase Survey (APS)**, purchase ratios are drawn from APS for total intermediate consumption allocation, data on GVA are from StatsWales website, which initially are from ONS Regional accounts. The components of GVA (providing breakdown of primary inputs by industry in 2 digits SIC) are drawn from 3 resources, ABS, UK IO tables, Scottish IO tables, when ABS numbers doesn't match with any publicly available information, Scottish or UK ratios are applied depends on which is closer to the ABS ratios.

Output for own final consumption, including Household expenditure, Non-Profit Institutions Serving Households (NPISH) Final Consumption Expenditure, gross fixed capital formation, Imports of products, Importers' trading margin, Taxes less subsidies on products, change in inventory are estimated from Wales regional IO tables 2019 mainly. Final demand is adjusted according to the 64 sector Wales IO table, in which Final demand is estimated according to UK IO tables, Scotland IO tables and ABS, depends on the ratios of specific variable to GVA among such ratios among UK IO tables, Scotland IO tables and ABS, multiply Wales number up to the ratio which ever that's closest to ABS estimation to estimate final demands for final consumption.

Final check is made to ensure that the estimated cells in the intermediate consumption part of the Use Table match with the published data when compared to the UK (i.e., they do not represent an unreasonably small or large proportion of the corresponding UK cells). The rest of the datasets are all used for references for the compilation process and final checks. But ABS and APS are the 2 main data sources for this project.

Construction of Initial Domestic Use Table

Total combined use of each industry is apportioned to domestic use, import Rest of UK, import Rest of World (RoW), taxes less subsidies on the products according to ratios of import to GVA or Output in Scotland and UK use tables, adjusted by relative importance of such industry in the region, mainly according to sectoral employment differences between within and outside of the region when compared with Scotland or UK tables 2018. Data collected by the team (Welsh Economy Research Unit) are also used for reference in this process.

Information Communication Technology (ICT) satellite account 2018

Industries or products and services categories are classified according to OECD (2011) ICT specialized products and services, in 4-digit Standard Industry Classifications (SIC) as below,

ICT products and services	SIC
Computers and peripheral equipment	2620
Communication equipment	2630
Consumer electronic equipment	2640, 2670
Miscellaneous ICT components and goods	2610, 2651, 2680
Business and productivity software and licensing services	5820
Information technology consultancy and services	6201, 6202, 6311, 7020
Telecommunications services	6110, 6120, 6130, 6190
Leasing or rental services for ICT equipment	7729, 7730
Other ICT services	3320, 6209, 7110, 9511, 9512

Table 1, ICT share of GDP and GVA by industry in £m (combined use at purchaser price)			
ICT industry	SIC	ICT industry output	ICT gross value added
Computers and peripheral equipment	2620	58	35
Communication equipment	2630	463	279
Consumer electronic equipment	2640, 2670	169	102
Miscellaneous ICT components and goods	2610, 2651, 2680	815	491
Business and productivity software and licensing services	5820	11	7
Information technology consultancy and services	6201, 6202, 6311, 7020	689	458
Telecommunications services	6110, 6120, 6130, 6190	1480	1101
Leasing or rental services for ICT equipment	7729, 7730	65	43
Other ICT services	3320, 6209, 7110, 9511, 9512	406	202
All other industries		129074	62506
Total		133231	65224

Industry output and GVA are estimated by starting from the combined use or domestic use table column totals, those totals are available at the most granular industry level possible according to ONS SRS data following clearance rules, combined with published data and data available to the team (Welsh Economy Research Unit at Cardiff University) following all the data protection procedures. However, most of the 4-digit SIC industry totals or purchase ratios for Wales 2018 are not available for this project due to minimum secure data publication clearance requirement and data scarcity itself. For those sectors that require more details in the sector (typically in 4-digit SIC level) than the available 2 digit SIC level, employment from Business Register and Employment Survey (BRES)/Nomis are used to apportion output, GVA and industry purchases from 2 digit to 4 digit SIC industry level, the following formula takes output for an example and illustrates how the apportion is done in a nutshell,

$$4\ digit\ SIC\ industry\ Output = 2\ digit\ SIC\ industry\ output * \frac{4\ digit\ SIC\ industry\ employment}{2\ digit\ SIC\ industry\ employment}$$

Table 2, Trade of ICT products and services by products or industries in £m					
ICT products and services, industries	SIC	Products export RUK	Products export RoW	Products import RUK	Products import RoW
Computers and peripheral equipment	2620	12.6	34.5	1.1	86.3
Communication equipment	2630	101.9	278.3	9.1	695.1
Consumer electronic equipment	2640, 2670	37.2	101.7	3.3	254.1
Miscellaneous ICT components and goods	2610, 2651, 2680	179.2	489.3	16.0	1222.3
Business and productivity software and licensing services	5820	0.2	3.9	1400.2	9.1
Information technology consultancy and services	6201, 6202, 6311, 7020	234.4	240.7	3200.1	122.3
Telecommunications services	6110, 6120, 6130, 6190	13.5	75.5	3201.7	276.8
Leasing or rental services for ICT equipment	7729, 7730	6.0	12.4	155.1	8.5
Other ICT services	3320, 6209, 7110, 9511, 9512	56.4	67.4	1410.4	38.5
All other industries		11538.3	14514.8	41992.0	14394.7

Products trade, including export to and import from UK and Rest of the World (RoW), is drawn from Wales IO domestic use tables 2018. If the product or industry category is not in the 4-digit SIC format that the ICT satellite account industry classifications would require, the trade totals are apportioned according to employment from BRES in a similar way as shown in the Table 1 formula.

Given that GVA and output are estimated for each 4-digit or 2-digit SIC industry, Scotland IO tables 2018's closest available industry import/GVA ratios are adjusted according to employment differences in this industry in the region and elsewhere in the UK between Wales and Scotland, then applied the adjusted ratios to Wales tables for trade estimations. Scotland IO tables and ratios are preferred here is because it has more details in terms of industry classifications, also it has the intertrade information that is not available in UK tables. Product exports are estimated according to the ratios of Scotland IO tables on the industry and product outputs.

Table 3, ICT products and services consumption by industry (excluding export) at purchaser prices in £m

ICT products and services	Computers and peripheral equipment	Communication equipment	Consumer electronic equipment	Miscellaneous ICT components and goods	Business and productivity software and licensing services	Information technology consultancy and services	Telecommunications services	Leasing or rental services for ICT equipment	Other ICT services	Total ICT specialized industries	all other non-ICT specialized industries	Final demand consumption	Total ICT consumption
Computers and peripheral equipment	0.175	0.478	0.515	2.477	0.005	0.446	0.372	0.002	0.214	4.68	17	87	109
Communication equipment	1.408	3.848	4.146	19.950	0.041	3.595	2.993	0.012	1.722	37.72	140	697	875
Consumer electronic equipment	0.515	1.406	1.516	7.292	0.015	1.314	1.094	0.005	0.629	13.79	51	255	320
Miscellaneous ICT components and goods	2.477	6.767	7.292	35.084	0.072	6.323	5.263	0.022	3.029	66.33	247	1226	1539
Business and productivity software and licensing services	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.008	0.008	0.02	4	45	49
Information technology consultancy and services	0.309	2.674	0.910	4.376	0.471	30.949	14.903	1.768	13.967	70.33	778	481	1330
Telecommunications services	0.076	0.366	0.224	1.078	0.063	10.817	146.772	1.562	7.795	168.75	504	912	1585
Leasing or rental services for ICT equipment	0.006	0.031	0.016	0.078	0.020	0.451	1.508	0.204	0.916	3.23	108	51	162
Other ICT services	0.895	0.993	2.636	12.683	0.064	9.099	2.879	0.141	4.921	34.31	350	140	524
All ICT specialized products and services consumption by all industries	6	17	17	83	1	63	176	4	33	399.15	2201	3893	6494
All other products and services	6	90	19	91	1	141	201	17	293	860.15	25018	35636	61514

Industry's combined consumption (excluding export by products, including imports from UK and RoW, and taxes less subsidies on products by industry), for the products and industry categories required that are at levels more granular than the existing industry and product level, the total consumption or purchase is apportioned by the 4-digit SIC employment from BRES 2018.

APS is the main source for purchase or consumption information across 2-digit and 4-digt industry in Wales in 2018, whereas PRODCOM is used to estimate which industries supply certain product or industry, the estimation assumption here is based on the fact that most industries are dominated but its main products. The purchases of certain ICT products (in 4-digit product format) therefore could be derived from PRODCOM with more details than APS. When there are differences between information drawn from PRODCOM and APS, APS is preferred because its purchase information include both services and products. Given total consumptions and use the purchase ratios from APS to allocate the totals would be more reliable because all the possible purchases are surveyed in APS, where PRODCOM only provides detailed supplies for manufacturing products. Products supply ratios from PRODCOM are sometimes preferred when certain 4-digit ICT products purchase information is needed and they are not available in APS.

When the consumption or purchase information for the 4-digit ICT products and services are not available at both APS and PRODCOM, employment by 4-digit SIC in Wales 2018 from BRES is still the key information to apportion the 2 digit industry and products consumption of ICT products and services, or any other consumption products and services into 4-digit industries as required, the assumption is that consumption patterns between the different 4-digit ICT specialized companies under the same 2 digit SIC are the same.

Table 4, Total domestic supply and internal consumption by industry in £m								
ICT products and services		Domestic product Output at basic prices	Product import RUK	Product import RoW	Taxes less subsidies on products	Total supply at purchaser prices	Total ICT consumption at purchaser prices	ICT ratio
Computers and peripheral equipment	2620	50	1	86	11	147	109	0.7367
Communication equipment	2630	334	5	695	88	1122	875	0.7798
…								
All non-ICT products and services		129384	68936	14768	9272	222360	12074	0.0543
All products and services		133231	70811	17481	9821	231344	18568	0.0803

Total domestic supply at purchaser price including domestic total supply at basic prices, imports UK, imports RoW, and tax less subsidies on products by industry. Total domestic supply categories information is drawn from corresponding column totals of domestic use table Wales 2018, apportioned according to employment from BRES and constructed in a similar methodology as the previous tables. Total domestic supply at purchaser price is the total supply of all the products and services. Total Internal supply by industry would be a sum of the domestic supply, imports from UK, imports from RoW, Tax less subsidies on products. Imports from UK are estimated according to Scotland regional import from Scotland 2018 table, adjusted according to the ratio of regional and non-regional employment of a certain industry in UK, further adjustment is made according to the relative importance of such ratios. Total internal consumption of the industry on the ICT specialized products and services by ICT specialized industry and all other industries are calculated in Table 3, a reconciliation of total internal supply and demand results in ICT ratios could therefore be calculated in Table 5, which is the key for Table 5.

Table 5, ICT direct employment and GVA in Wales 2018

ICT industry	GVA/FTE (£/FTE)
Computers and peripheral equipment	163,144
Communication equipment	157,557
Consumer electronic equipment	162,029
Miscellaneous ICT components and goods	312,822
Business and productivity software and licensing services	92,883
Information technology consultancy and services	253,768
Telecommunications services	158,817
Leasing or rental services for ICT equipment	99,368
Other ICT services	58,239
All other industries	59,927
Total	62,326

Employment in this table includes VAT or Pay-As-You-Earn (PAYE) schemes registered self-employed workers and working owners, self-employed not registered for these and HM Forces and Government Supported trainees are excluded. Employment including full-time, part-time employees, employment (employees plus work owners) is drawn from Nomis platform by BRES, which is initially collected from BRES by 5 digits SIC code, FTEs are calculated as

FTE=Full-time + 0.5 x Part-time

ICT direct FTEs=ICT ratios x FTEs

ICT direct GVA= ICT ratios x GVA

Productivity of each ICT industry is also calculated as GVA divided by FTE for each industry and all industry, from productivity across industries could be calculated and ICTs have a higher productivity than all industries in average in Wales 2018 in terms of GVA/FTE.

Limitations

Although the project has been carried out with the effort to utilize the best possible methods and data resources, approximations and assumptions were made through the process so that the project could be appropriately completed. Specifically, the following limitations could be identified given the data and status quo development of ICT satellite account worldwide,

- Data scarcity is the main issue, because this is a very data demanding process, additional and more detailed data would help the project greatly, for example, the detailed ICT use, and supply information of non-ICT businesses would be very helpful.
- The ICT satellite account framework proposed in this study is different from framework suggested by OECD, the latter might be promoted across countries and widely used in the future when the data are available although they are currently not possible to compile.
- Given than the framework of ICT satellite account is still at its early stages of development worldwide, ICT satellite accounts are not widely comparable yet due to the inconsistency of frameworks and data standards between regions and nations.

Conclusions

Despite this has been an extremely data demanding process, this project compiled an ICT satellite account that could measure the contribution of ICT in a way that is consistent with SNA, so that the overall impact of ICT across the Welsh economy in the reference year, 2018, could be measured and compared with other established industries in the SNA. In addition to make the best use of the data sources available, there have been assumptions and approximations made as part of the estimation to reflect the true values of the aggregates in ICT satellite account, but it is a way to effectively show the overall and detailed contributions of ICTs, which may serve as an important tool for policy making.

For example, the following key results could be drawn from the ICT satellite account 2018 for Wales,

• In total, ICT products and services directly contribute to 8% of the GVA in Wales in 2018.

• ICT industries have a higher productivity in terms of GVA/FTE compared with other non-ICT industries in Wales in 2018.

• Among all the ICT industries, Miscellaneous ICT components and goods and Information technology consultancy and services have the highest

productivity in terms of GVA/FTE in Wales in 2018.

• In Wales in 2018, ICT overall direct contribution to employment is 90,352, accounts about 6.7% if the total employment in Wales.

• In Wales in 2018, ICT overall direct contribution to GVA is £5.235 billion, accounts about 8.0% of the total GVA in Wales in 2018.

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