

# THE CONTRIBUTION OF THE FINANCIAL SERVICES SECTOR TO THE ECONOMY

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MFSA

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MALTA FINANCIAL SERVICES AUTHORITY



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# EXECUTIVE SUMMARY

This publication presents a review of the economic contribution of the financial services sector, placing a special emphasis on the direct, indirect and induced effects generated both at an aggregate and at a sub-sectoral level. The analysis presented was undertaken on the basis of selected Input-Output methods using a SIOT for the Maltese Economy for the reference year of 2010 published in May 2016.

The picture that emerges is that of a sector largely dominated by the activity of banks, investment funds and special purpose entities. In recent years, however, auxiliary services and pension and insurance activities appear to be outpacing the dominant activities in terms of growth.

The report also presents a review of the input and output structure of the sector. On the input side, the sector is highly dependent on imports, particularly from firms operating in the same sector. This points to the potential for further growth from attracting more of the provision of such inputs to Malta. Turning to output, foreign demand is found to be a main driver as most of the sector's output is exported, with less than one fifth being purchased locally. Despite only a small proportion being purchased by domestic firms, output from the sector is still found to be a key input for certain sectors locally.

To allow for a more comprehensive estimate of the impact of the sector on the economy, simple and total multipliers were calculated using the Leontief inverse matrix. These multipliers portray how an increase in final demand could potentially impact the economy, through direct, indirect and induced effects. At a sub-sector level, findings suggest that the total effect of an increase in final demand appears to be greater for the insurance, pension funding activities and auxiliary financial services. This is true not only in terms of gross value added but also for employment and income, which in turn, has interesting implications for policy. At an aggregate level, the total multipliers obtained for the financial services sector are relatively lower in comparison with other dominant sectors in the economy. This is largely attributed to the high import content within the sector, which is affected by the activities of Special Purpose Entities (SPEs).

Furthermore, the calculation of accounting multipliers, which implicitly also capture the size of the sector, put the total contribution of the sector amongst the highest in the Maltese economy.

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# 1. INTRODUCTION

It is widely acknowledged that the financial services sector plays a major role in the Maltese economy. This publication presents an in-depth analysis of the composition of the sector, both at an aggregate and at a sub-sectoral level. It also delves deeper into the sector's inter relationships with other economic sectors from both an input and output perspective. Apart from deepening the understanding of the sectoral linkages of the financial services sector and its contribution to the Maltese economy, this study could also inform policy makers on strategic issues related to the future development of the sector.

Part of the analysis presented in this publication is based on an Input-Output study using Symmetric Input Output Tables for the reference year 2010 (SIOT 2010) published in May 2016 by the National Statistics Office<sup>1</sup>.

The input-output methodology is a standard methodology used widely to express and gauge the links of networked components within a system and, amongst others, has been used extensively in studying the impact of different sectors on the economy as a whole. Apart from yielding the magnitudes of specific multipliers, it also caters for the scale and hence the importance of specific sectors in the economy, and provides a consistent framework within which impact assessments could be carried out. Furthermore, this standard methodology eases comparison with past studies and international comparisons.

The following section provides an analysis of the financial services sector (defined as NACE Sectors K64-K66) taking into account only direct effects. This initial assessment aims at uncovering various characteristics of the sub-sectors associated with financial service sector within the context of the productive structure of the entire Maltese Economy. It also aims at providing an initial assessment of its inter-industry relations.

Section 3 follows with an application of various input-output techniques to gain a further understanding of the sector and its sub-components, not only through direct effects, but also through indirect and induced effects.

The final section sums up the report with relevant conclusions and recommendations.

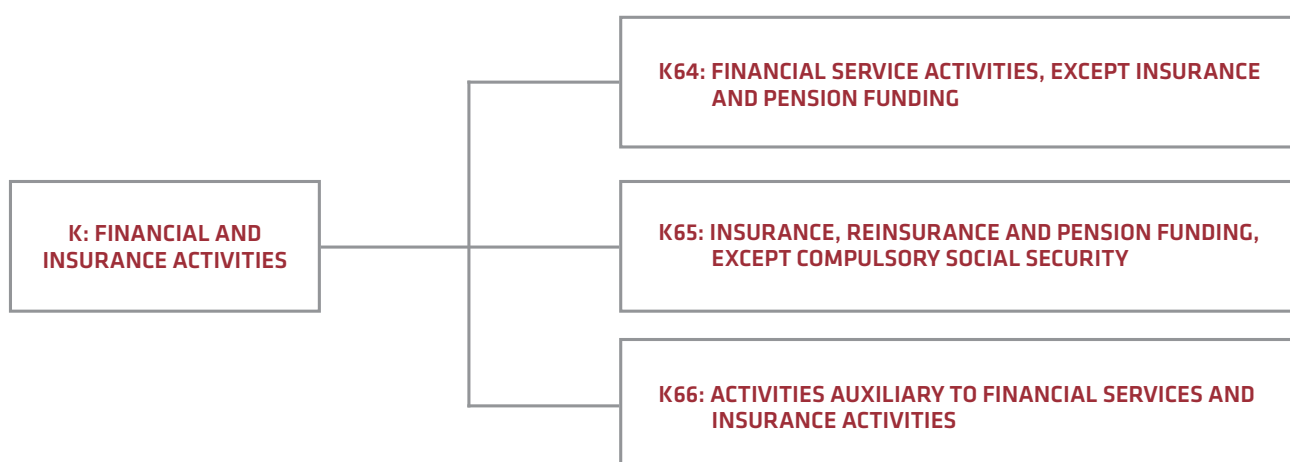
<sup>1</sup> The cut-off date for the information published in this Report is 1st September 2017. Figures in tables may not add up due to rounding.

# 2. ANALYSIS OF SECTOR K: FINANCIAL SERVICES SECTOR

## 2.1 Overview of Sector K

Since the 1970s the European Union has adopted the Statistical Classification of Economic Activities in the European Community, commonly referred to as NACE. This allows the comparability of statistics produced both at a European level as well as at an international level. The most recent version of the NACE classification was introduced in 2006. The NACE Rev.2 is a four-digit classification providing the framework for collecting and presenting a large range of statistical data according to economic activity in the fields of economic statistics. A total of approximately 100 different sectoral classifications are present in the NACE Rev.2, with the aggregate Financial and Insurance activities sector being defined as sector K.

Figure 1 Sub-sectors within Sector K



As illustrated in Figure 1 above, sector K in NACE Rev.2, is composed of three sub-sectors. Sub-sector K64 includes the activities of obtaining and redistributing funds other than for the purpose of insurance or pension funding or compulsory social security. This is further divided into four divisions, monetary intermediation (K64.1), activities of holding companies (K64.2), trusts, investment funds and similar financial entities (K64.3) and other financial service activities, except insurance and pension funding (K64.4).

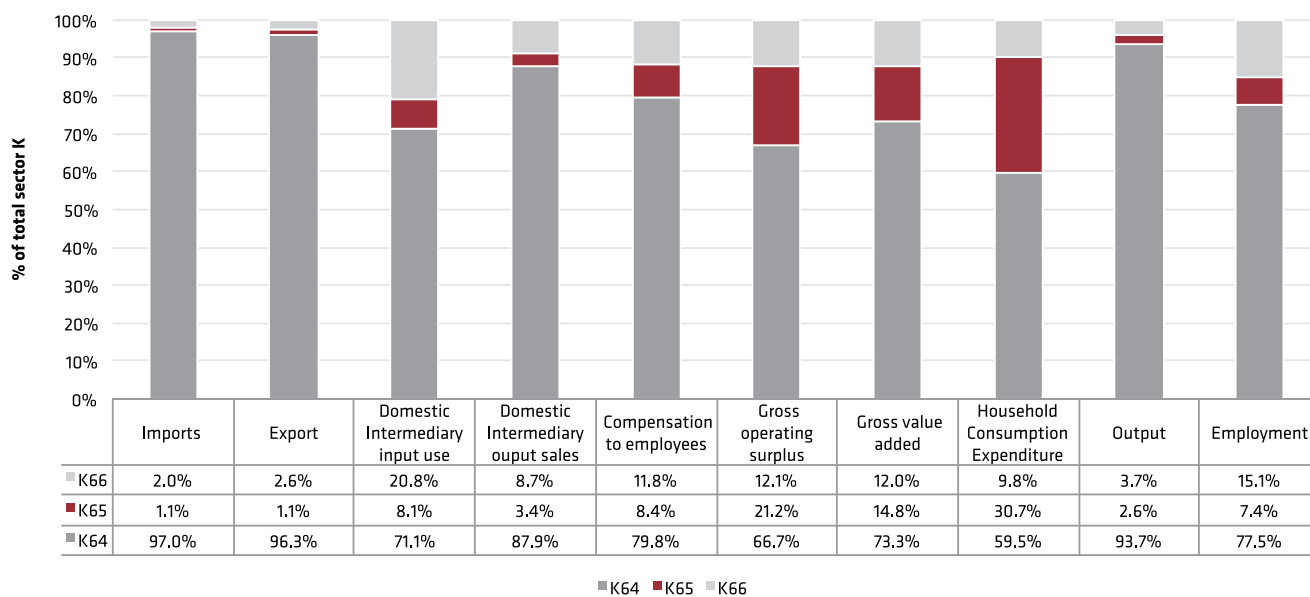
Sub-sector K65 represents insurance, reinsurance and pension funding activities, except for compulsory social security. This includes insurance (K65.1), reinsurance (K65.2) and pension funding (K65.3). Hence, this division takes into account the underwriting annuities and insurance policies and investing premiums which together build up a portfolio of financial assets to be used against future claims.



Activities auxiliary to financial services and insurance activities, sub-sector K66, includes the provisioning of services in or closely related to financial service activities, but not directly providing financial services.

Turning to the composition of the sector, sub-sector K64, accounts for the largest proportion of all key descriptive statistics, hence reflecting its overall dominant position in relation to the sector as a whole. Most notably, this sub-sector, which includes all financial services except insurance and pension funding, accounts for 97% of the total imports and 96.3% of total exports (see Figure 2). At the same time, despite having a small share (2.6%) in output and employment, insurance and pension activities (K 65) accounts for a sizeable 30.7% of all household consumption expenditure in the sector.

Figure 2 Overview of Sector K (SIOT 2010)



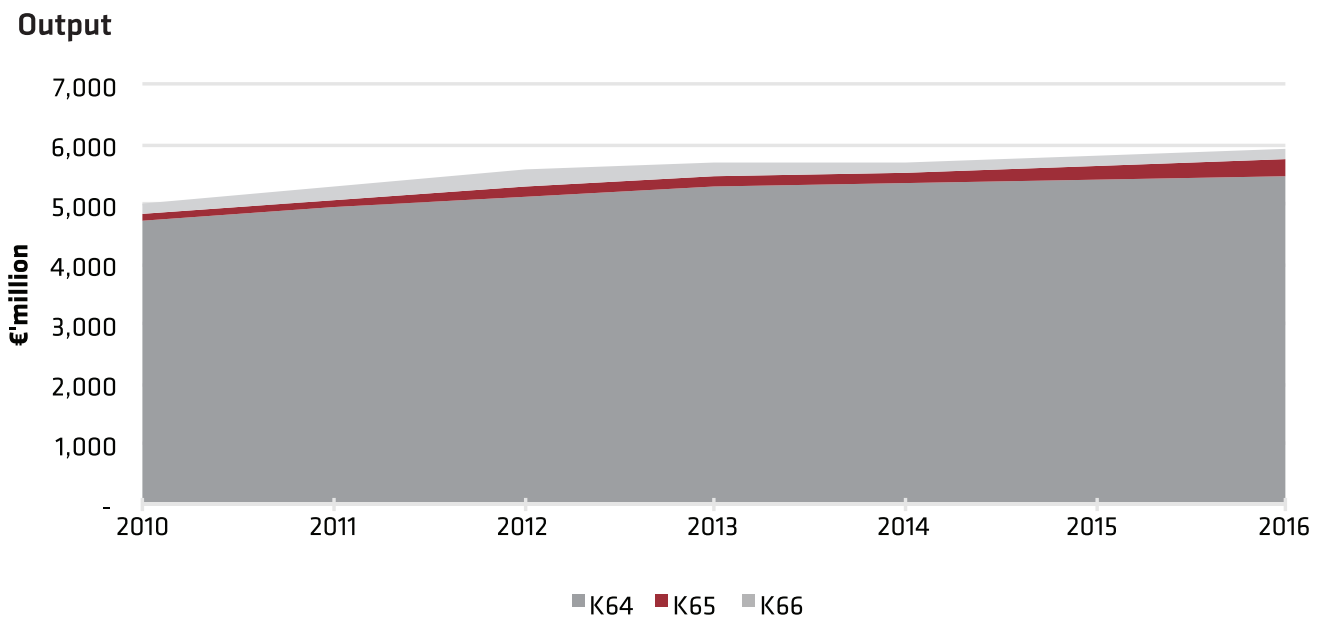
It is important to note that, as per ESA2010, the data underlying this study includes also the activity of special purpose entities (SPEs), which fall under sectors K64 and K66. SPEs relate to institutions mainly involved in invoicing or acting as holding companies. More formally, a SPE may be defined as a limited company or a limited partnership, created to fulfil narrow, specific or temporary objectives and to isolate a financial risk, a specific taxation or a regulatory risk.

### 2.1.1 Output and Gross Value Added

Output is defined by Eurostat as consisting of the products created or services rendered during the accounting period. In 2016, 92% of total output of the entire financial services sector was attributable to the activities covered in K64. Pension and insurance activities (K65) accounted for 4.5% of total output whilst the remaining 3.4% was attributable to activities auxiliary to financial services (K66).

Between 2010 and 2016 the production of output from the financial services sector as a whole, increased from €5,041 million to €5,950 million, implying an overall increase of 18.0% (see Figure 3).

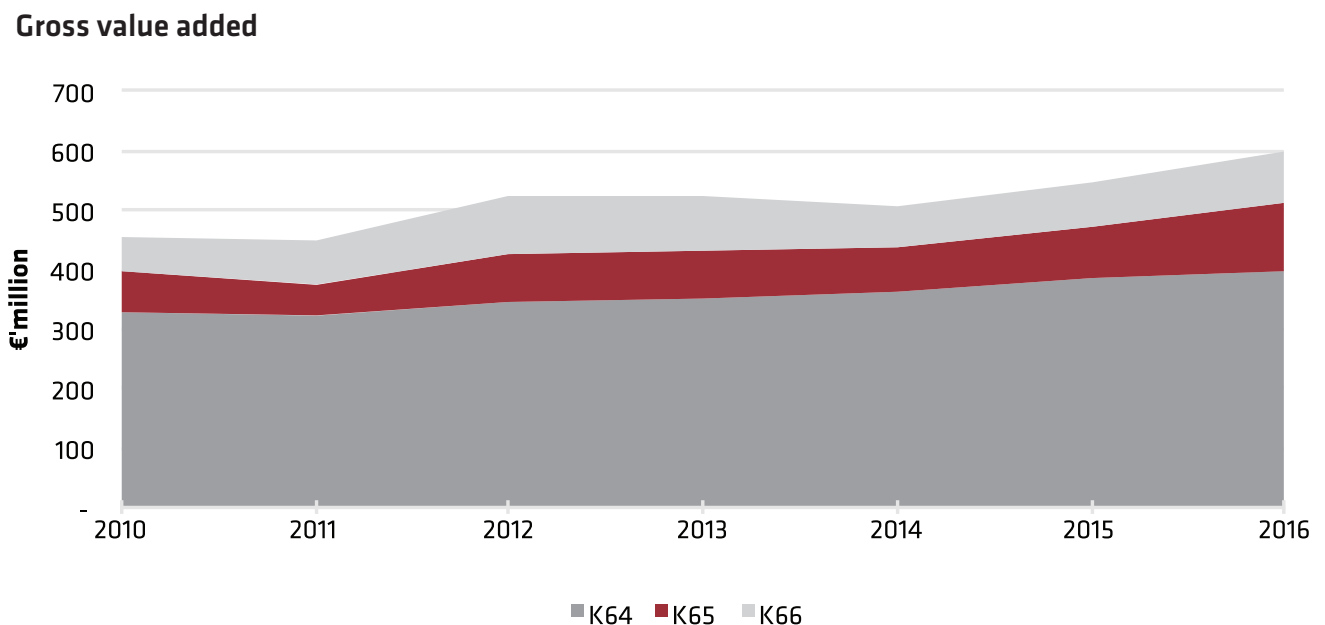
Figure 3 Sector K Output



From all sub-sectors, insurance and pension funding activities (K65) registered the largest growth in output for the period 2010-2016. It recorded an overall expansion in output of approximately 106.2%. Despite this growth, insurance and pension fund activities accounted for only 4.5% of the total sector output in 2016.

As stated previously, output of a sector is the final value of goods and services for a given period. Gross Value Added (GVA), on the other hand, captures the value generated by a sector by subtracting the input costs. It indicates the contribution of each individual producer, industry or sector towards the economy.

Figure 4 GVA generated directly by Sector K



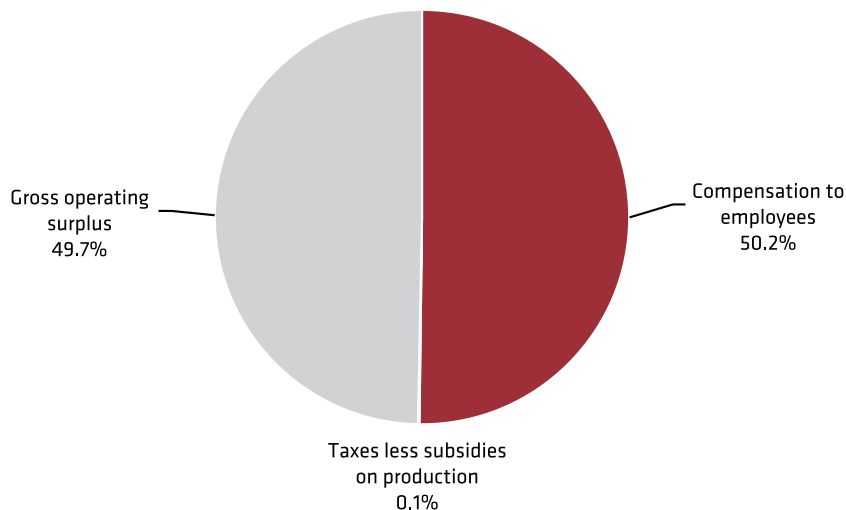
As may be observed from Figure 4, between 2010 and 2016 the generation of GVA attributable to the financial services sector has increased significantly, such that in 2016, the direct GVA attributable to the activities of the financial services sector amounted to €598 million. This implies that the sector's direct contribution to the total GVA in 2016 stood at

6.9%. However, it should be noted that this represents a decline in the sectors relative contribution from the 7.8% of GVA attributable to the sector for 2010. This development is in large part due to the exceptional growth in generation of total GVA experienced by the Maltese economy over this period, which amounts to 50.1%. This was driven in large part by sizeable expansion of a number of other key service sectors operating in the Maltese economy.

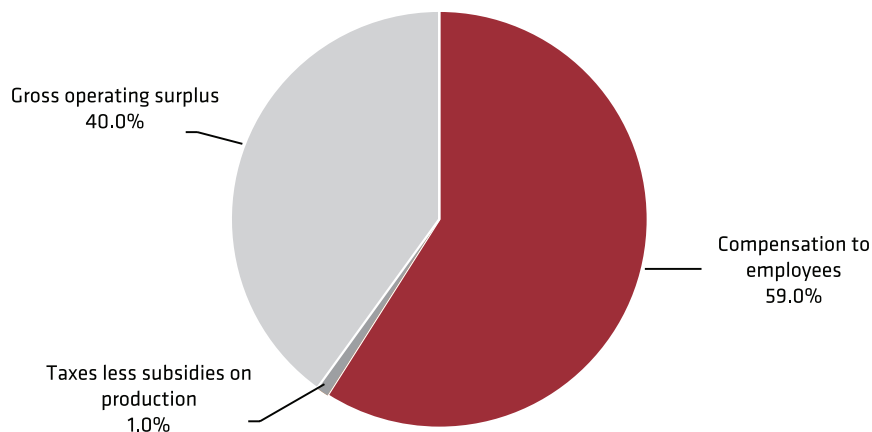
Looking at the individual sub-sectors, in 2016 financial services activities as captured by K64 accounted for 66.2% of the total GVA for sector K, whilst insurance and pension funding activities (K65) and auxiliary activities (K66) accounted for 19.1% and 14.6% respectively.

Figure 5 Drivers of GVA in Sector K

**Sector K contribution to GVA - 2010**



**Sector K contribution to GVA - 2016**



As can be seen from Figure 5, there were significant changes in the main factors driving the generation of GVA between 2010 and 2016, with certain drivers gaining greater significance over others.

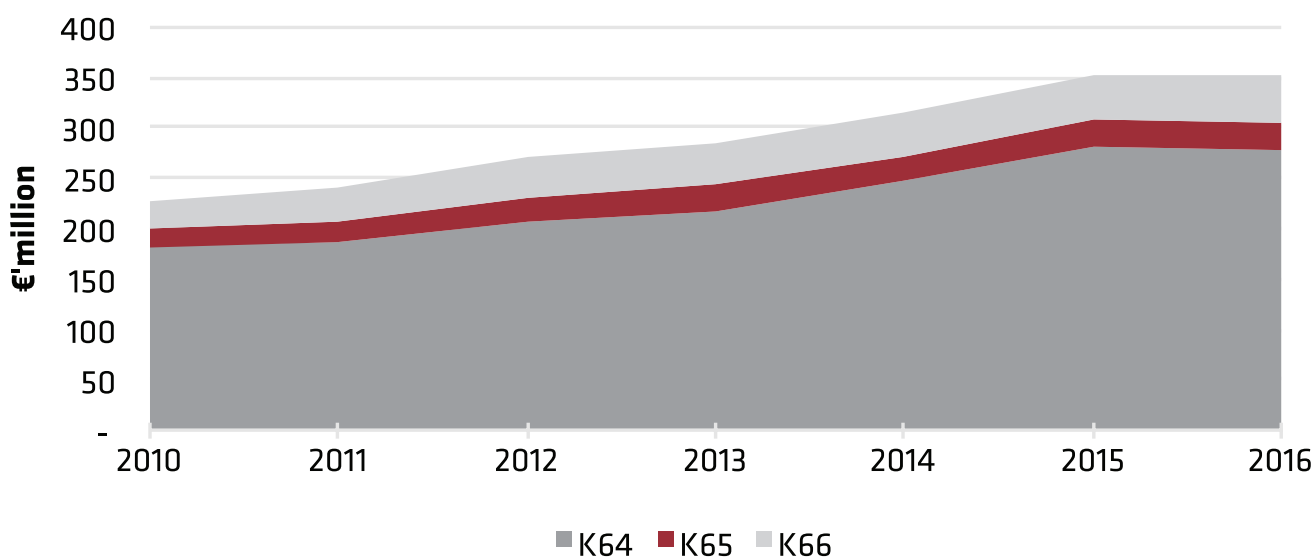
Notably, the generation of GVA by sector K attributable to compensation of employees has increased from 50.2% in 2010 to 59.0% in 2016. The second main driver of GVA is the Gross Operating Surplus (GOS), which can be loosely defined as operating profits. The contribution from gross operating surplus, although still highly significant as the secondary driver of GVA, has experienced a decline from 49.7% in 2010 to 40.0% in 2016. This reflects higher resources accruing to employment relative to capital over the six years to 2016 and hence more propensity to support domestic demand in the local economy. Figure 5 shows also a significantly higher tax take accruing to government from the activity generated by the sector over the period under review.

### 2.1.2 Compensation of Employees and Employment

Compensation of employees is defined by Eurostat as consisting of all remuneration, in cash and in kind, which employees receive from their employers in return for work done during the relevant accounting period. Between 2010 and 2016 compensation of employees paid by the financial services sector rose significantly (see Figure 6). In fact, from a total of €226 million in 2010 it rose to €353 million by 2016, implying a growth rate of 56.2%. This growth rate exceeded that observed for compensation of employees across the Maltese economy as a whole, which grew at a rate of 47% over the same period.

Figure 6 Sector K Compensation of Employees

#### Compensation of employees

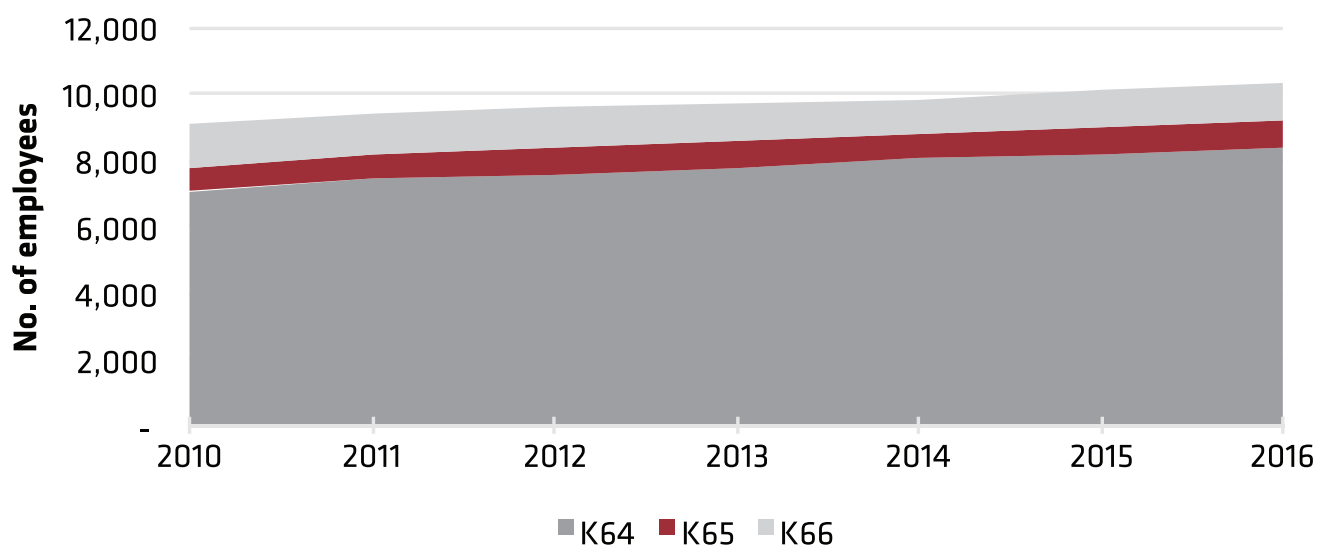


All three sub-sectors experienced a growth of above 50% with auxiliary services (K66) registering the largest expansion for the 2010 to 2016 period. In fact, compensation of employees for this sub-sector grew from €27 million to €46million.

In 2016, core financial services (K64) accounted for 79.0% of the total compensation of employees attributable to the total sector K, whilst K65 and K66 accounted for 7.6% and 13.0% respectively.

Figure 7 Employment in Sector K (based on JobsPlus data)

## Employment



Between 2010 and 2016 employment<sup>2</sup> within the financial services sector grew by 13.7% to 10,345. Insurance and pension funding activities registered the largest growth in employment (21.6%) from all the K sectors between 2010 and 2016. On the other hand, employment contracted by 10.1% within K66.

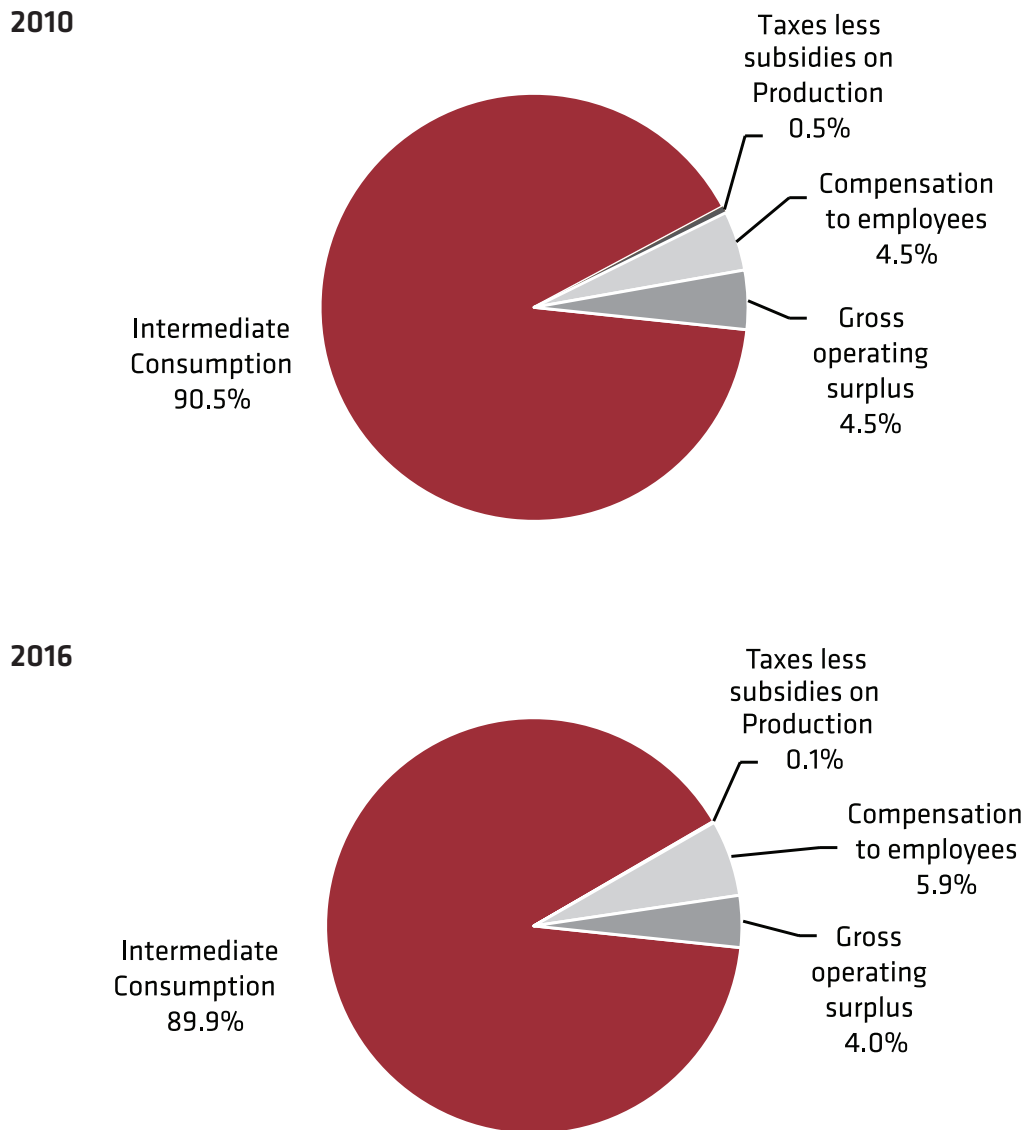
At the same time, as shown in Figure 7, in terms of the sub-sectoral employment composition, in 2016, K64 accounted for 80.5% of the total employment for sector K, whilst K65 and K66 accounted for 7.9% and 11.6% respectively.

### 2.1.3 The input structure of Sector K

Figure 8, which depicts the financial services sector's total input use by category indicates that, at approximately 90%, intermediate consumption accounts for the majority of input purchases. On the other hand, in 2016, labour use, (based on compensation to employees) accounted for approximately 5.9% of the sectors' total inputs, whilst gross operating surplus, which may be interpreted as payments generated in lieu of the capital investment in the sector, accounted for another 4.0%. Payments to general government, which consist mostly of ad valorem taxes and import taxes paid to undertake production activities, accounted for the remaining 0.1% of total input use.

<sup>2</sup>The employment data presented in this section is based on JobsPlus data. The classification of this data is based on NACE Rev. 2. Thus this data may not be directly comparable to statistics originating from the Eurostat LFS database utilized later.

Figure 8 Sector K Input Use (SIOT 2010)

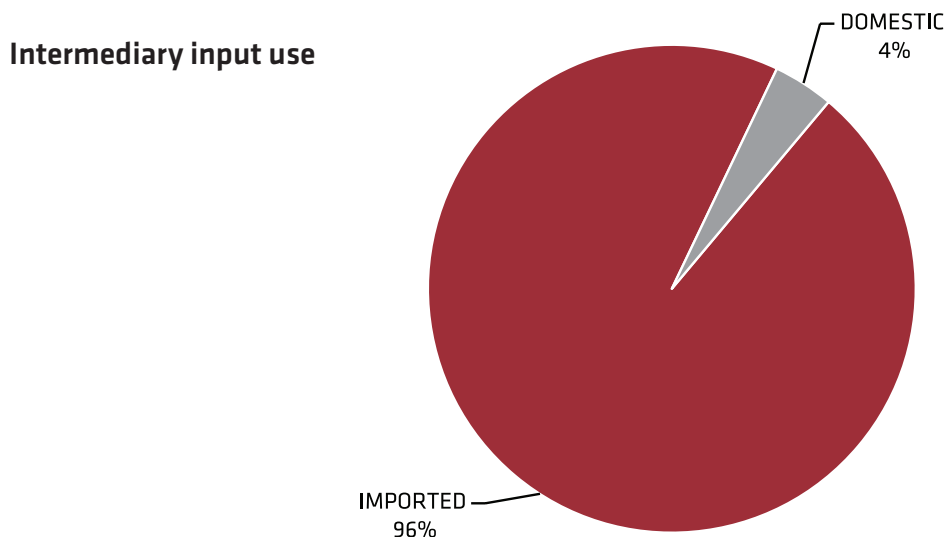


The respective input use categories have remained largely constant between 2010 and 2016. A marginal decline in the share of intermediate consumption, taxes less subsidies and gross operating surplus components has resulted in a respective marginal increase in the share for compensation to employees.

## 2.2 Detailed analysis of the input and output structure of Sector K

Symmetric input-output tables allow for a more in depth analysis of the input and output structure of the various sectors in the economy. The analysis presented in this section uses the most recent SIOT data (reference year 2010) published by the NSO in May 2016. Despite the changes in the economy since 2010, the analysis is still useful in understanding the main characteristics of the input and output structure of the financial services sector.

Figure 9 Sector K Input Use - Domestic vs Imported



One striking characteristic is the high proportion of imported intermediary inputs used in the financial services sector. Figure 9 depicts the split of intermediary inputs as imported and domestic. Notably, in 2010, out of the €4,563 million worth of intermediate goods and services purchased as inputs by the financial services sector, only €183.3 million are purchased from domestic (Malta based) firms. This implies that 96% of the necessary intermediary input requirements of the sector are effectively supplied in the form of imports. This is an interesting aspect from a policy perspective, since such a high import content indicates the potential for attracting these inputs to Malta's shores and hence reducing the leakages from the sector. Put differently, lower import content would result in a higher value added multiplier effect, in view of the higher proportion of the resulting economic activity retained in Malta.

These figures are, however, to be interpreted with caution since as per ESA2010, the underlying data includes also the activity of special purpose entities (SPEs), which fall under sub-sectors K64 and K66. The potential distortion on the multipliers due to SPEs in input-output analysis has been documented in previous studies for Malta (Cassar (2017) and Rapa (2017)).

### 2.2.1 Sectoral analysis of total input purchases

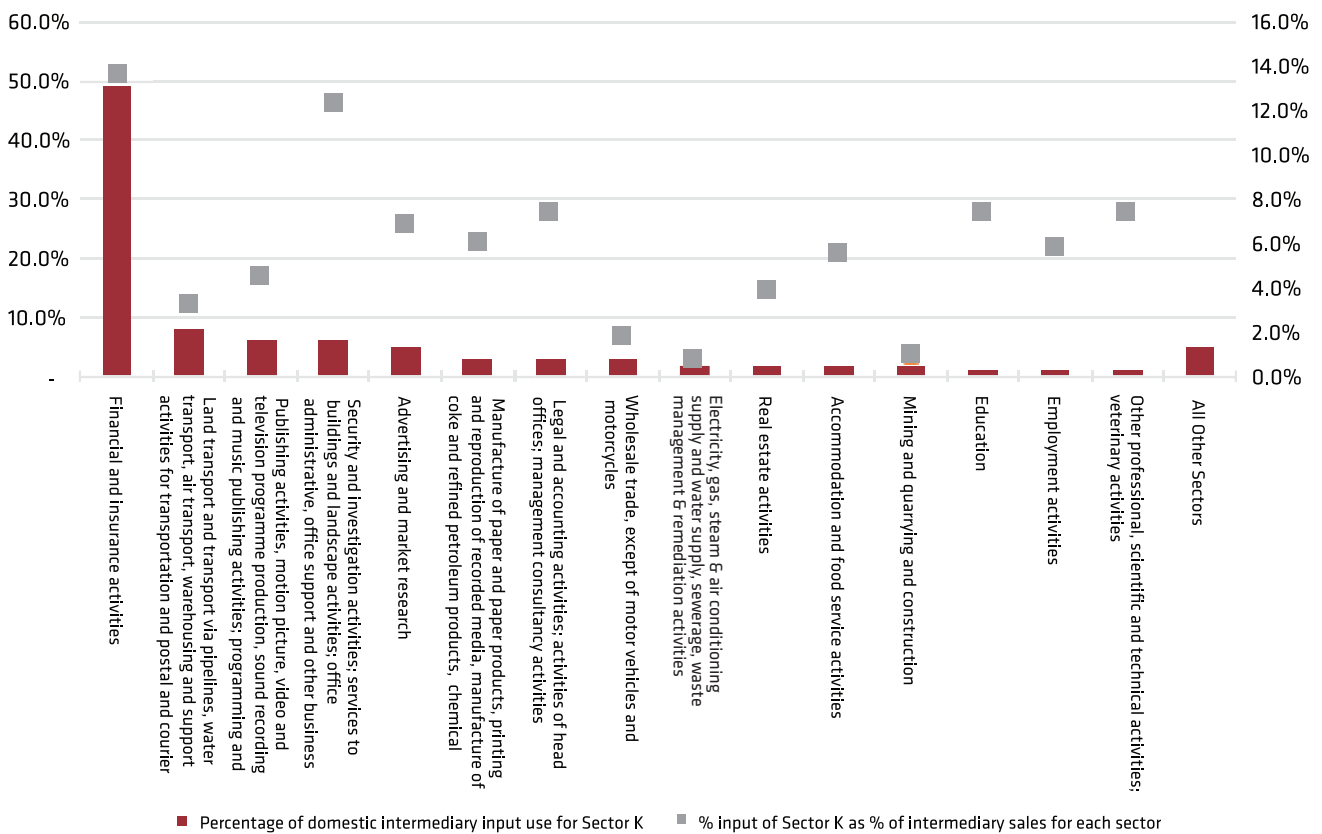
From the SIOT, for 2010 it is also possible to identify the pattern of distribution of intermediary input use (purchases) across industries disaggregated by domestic and imported origins. The data shows that firms within the financial sector purchase the largest share of their inputs, around 84%, from other firms operating within the same sector, the majority of which are being imported.

Removing the imported content from the purchases of intermediary input use allows for the identification of those domestic industries whose supply is crucial for the direct production process of sector K.

In 2010, the domestic input purchases of the financial services sector amounted to €183.3 million. Figure 10 illustrates the top fifteen domestic sectors from which Sector K purchases the largest proportion of its domestic intermediary inputs. The left hand axis illustrates the proportionate use of each domestic input purchase as proportion of sector K's total domestic purchases whilst the right hand axis illustrates the respective share of each sector's total intermediary output sales that are purchased by sector K. For example, 6% of the domestic purchases of sector K are from the Security and investigation activities; services to buildings and landscape activities; office administrative, office support and other business support services sector (N80-N82), this represents 12.3% of the total domestic sales of sector N80-N82.

Legal and accounting activities; activities of head offices; management consultancy activities sectors (M69-M70), is the second highest ranked sector from which the financial services sector purchases inputs. At €195 million, it represents 4.2% of the total input purchases of sector K or 7.4% of the total domestic sales of the M69-M70 activities. Out of this total amount however, only approximately €5 million worth of services or 0.1% of total inputs, was purchased from domestic firms within M69-M70, whilst the remaining €189.9 million (4.2% of total inputs) was imported, again highlighting the potential for attracting more locally-based input providers for the financial sector.

Figure 10 Sectoral Distribution of Domestic Input Purchases by Sector K

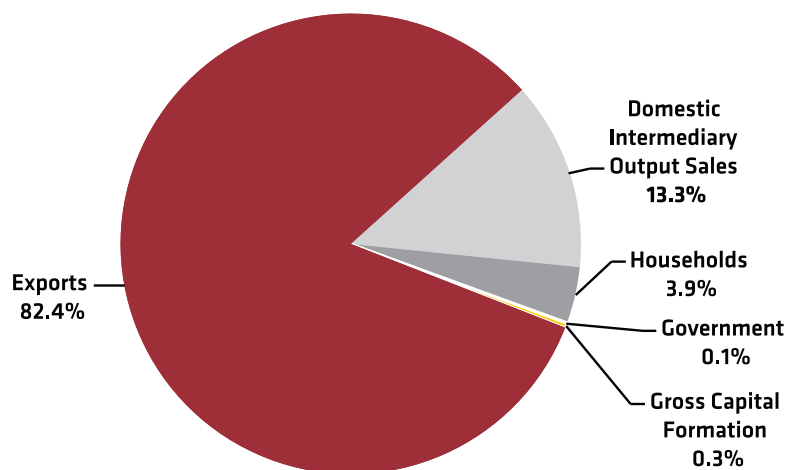


### 2.2.2 The distribution pattern of output sales

A similar analysis can be carried out to shed light on the industry’s sales pattern and how sales are distributed between purchases by other industries for use as intermediary inputs and purchases of goods and services consumed by the components of final demand. As can be seen in Figure 11, the lion’s share of output from the sector is exported. More specifically, out of the €5,040 million worth of output produced by the sector, €4,153 million, or 82.4% of total output was exported<sup>3</sup>.

Figure 11 Sector K total output use by category

Share of total output use by category (2010)



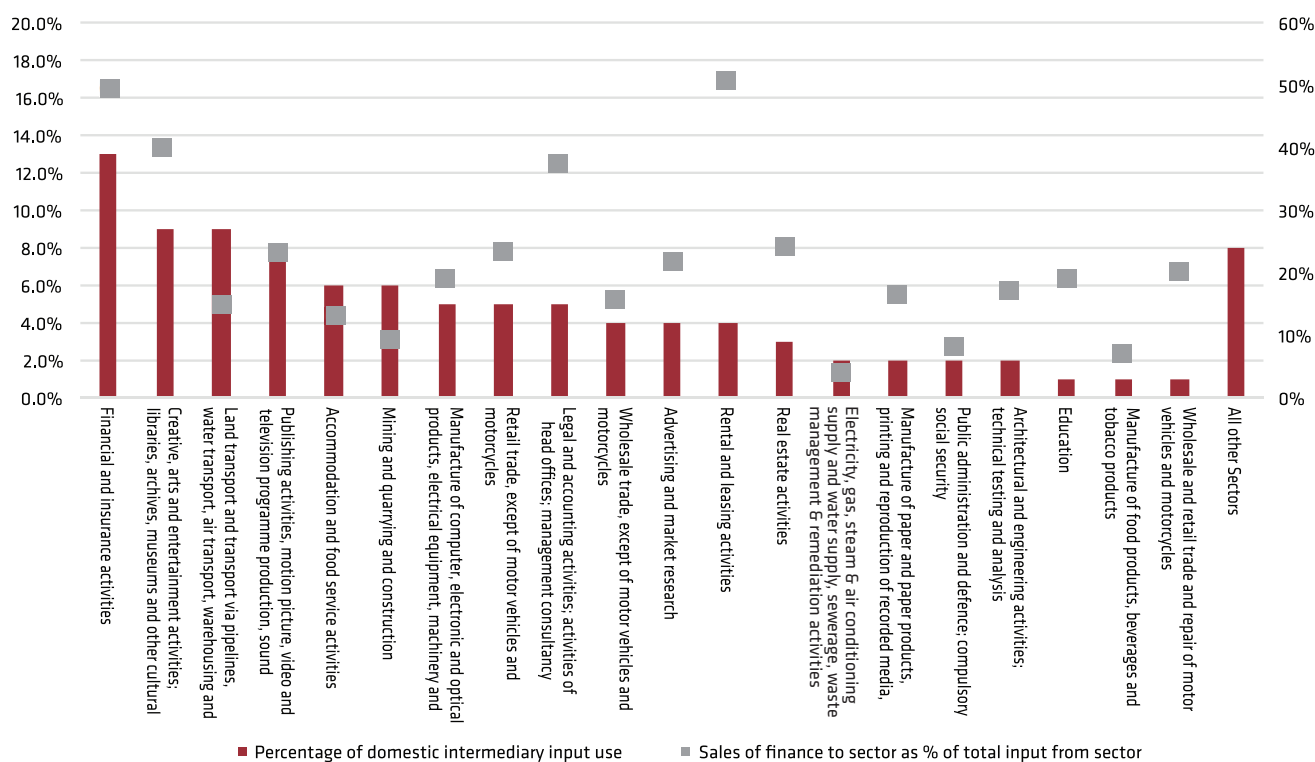
<sup>3</sup> It should be noted that the relative distribution pattern of output (sales) and input (purchases) across the various components as presented in this section includes SPEs present within the sector.



Notably, only approximately 13.3% of the output of the financial services sector is purchased as inputs by other domestic industries in Malta, with domestic households, government and gross fixed capital formation collectively accounting for the purchases of the remaining 4.3% of total output sales of the sector.

Figure 12 illustrates the distribution of output sales made to domestic sectors by the financial services sector, which in 2010 amounted to €669 million. From this chart it is possible to evaluate the importance of the supply of output from the financial services sector for the direct production process of other sectors in the economy. The left hand axis illustrates domestic output purchased from sector K as a proportion of the sector's total domestic sales, whilst the right hand axis illustrates respectively the share that these input purchases represent in terms of the total intermediary input use for each sector. For example, 9% of the financial services sector's domestic output sales is purchased from the Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities (R90-R92). This amount represents 40.0% of the total domestic purchases of the sector, which is in turn dominated by the activities of the gaming industry, hence reflecting the importance of the financial sector to other significant contributors in the Maltese economy.

Figure 12 Sector K output sales made to domestic sectors



# 3. INPUT-OUTPUT MULTIPLIER ANALYSIS

The previous sections of this report presented an overview of the direct impact of the financial services sector on the Maltese economy. Particular emphasis was placed on the defining characteristics of the sector, its input and output structure and the direct generation of jobs and output. This section also considers the indirect and induced effects generated by the sector. So as to gauge the full impact of the sector on the domestic economy the Leontief demand driven input-output framework was used (see Appendix A for a more detailed non-technical explanation of the framework).

In input-output analysis the economy is broken down into sectors (or industries) and their flow of goods and services recorded to trace systematically the relations amongst them. From this framework one can derive two types of multipliers, namely Simple (also known as Type I) and Total (or Type II) multipliers. Simple multipliers, sum together direct and indirect<sup>4</sup> effects resulting from an increase in final demand of a specific sector on certain economic variables, such as output, value added, income and employment. For instance, the Simple output multiplier gauges the impact that a one Euro increase in the final demand of a specific sector would have in terms of additional output production across all sectors of the economy. Apart from the direct and indirect effects captured in Simple multipliers, Total (Type II) multipliers take also into account the induced effects, which in turn reflect the changes in consumption brought about by the movement in income generated from the directly affected productive sectors. In other words, Total multipliers capture the aggregate effect of a given sector on the domestic economy.

This section continues with an analysis of the various multipliers for the financial sector at both an aggregate as well as at a sub-sectoral level based on SIOT 2010.

## 3.1 Aggregate Financial Services Sector Multiplier Analysis

### 3.1.1 Sector K Simple and Total Multipliers

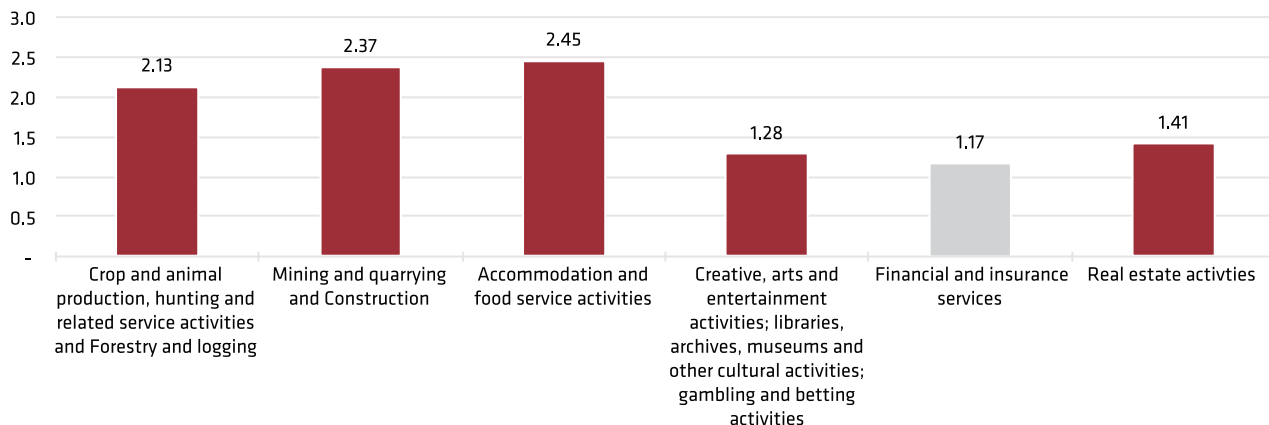
Starting from the Simple multipliers, the output multiplier for the aggregate financial services sector as a whole was calculated at 1.05, implying that every additional Euro worth of final demand supplied by the financial services sector would generate an increase in output production amounting to €1.05, through its direct and indirect effects.

Turning to Total multipliers, which also take into account induced effects, the output multiplier for the financial sector as a whole stood at 1.17, implying that a total increase in output of €1.17 is generated to satisfy a €1 increase in final demand of the sector. Figure 13 presents a comparison of the Total output multipliers for a number of sectors which are traditionally considered to be of high importance to the Maltese economy against the Total output multiplier generated by the financial services sector as a whole. The Total multiplier for the hotels and restaurants sector is ranked amongst the highest in the Maltese economy, with a value of 2.45. The higher the import-content within the production process of a sector, the smaller the size of the resulting multiplier. This, in fact, explains in large part the relatively low total output multiplier for sector K.

<sup>4</sup> Direct effects represent the initial change in the industry in question, whilst indirect effects represent changes in inter-industry transactions when supplying industries respond to increased demands from the directly affected industries.

Figure 13 Comparison of Total output multipliers

**Total output multiplier**



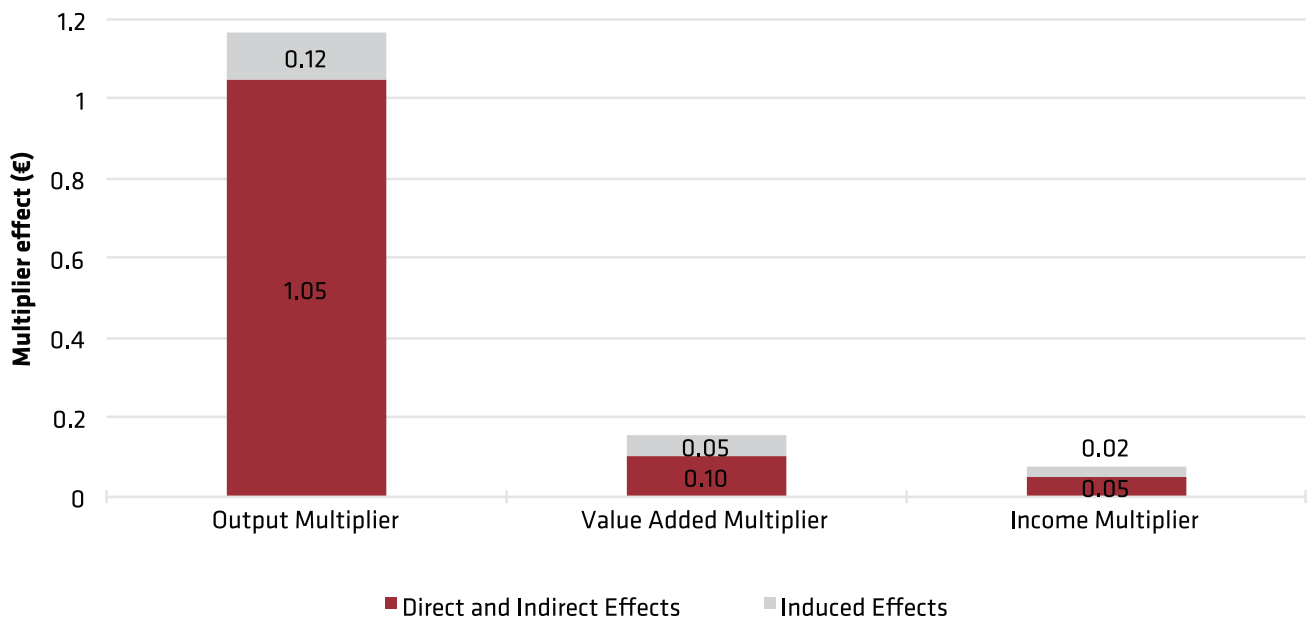
Narrowing the focus to Gross Value Added (GVA), which eliminates input costs, the Total value added multiplier measures the amount that a €1 increase in the final demand for the financial services sector would generate in terms of additional gross value added in the economy, through direct, indirect and induced effects on production.

As can be seen in Figure 14, the derived Total value added multiplier for the financial services sector, estimates that every Euro of final demand for this sector generated on average €0.15 of value-added across all sectors in the economy. From this total, €0.10 is generated by way of direct and indirect effects as a result of the sectors inter-industry linkages. The remaining €0.05 of value added corresponds to the additional value-added generated as a result of the induced effects on production.

At 0.15, the value added multiplier can be seen as rather low, however two caveats are of order at this stage. Firstly, the high import content aspect of the sector discussed earlier is at the root of such a relatively low level, which in turn is heavily influenced by the SPE activity that is included in Sector K. Indeed, when comparing the Total value added multiplier for sub-sector K64 obtained from the SIOT (2010) and that obtained using the SIOT (2008) found in Cassar (2015), which by definition excluded SPE activity, it is interesting to note that the latter was found to be approximately ten times larger.

Furthermore, the multipliers on their own do not reflect the scale of any given sector. Hence a sector might have a high value added multiplier but a relatively low level of final demand, and vice versa. The interaction of both scale and the magnitude of the multiplier will ultimately determine the overall economic impact on the economy. This is discussed in more detail in Section 3.1.2 hereunder.

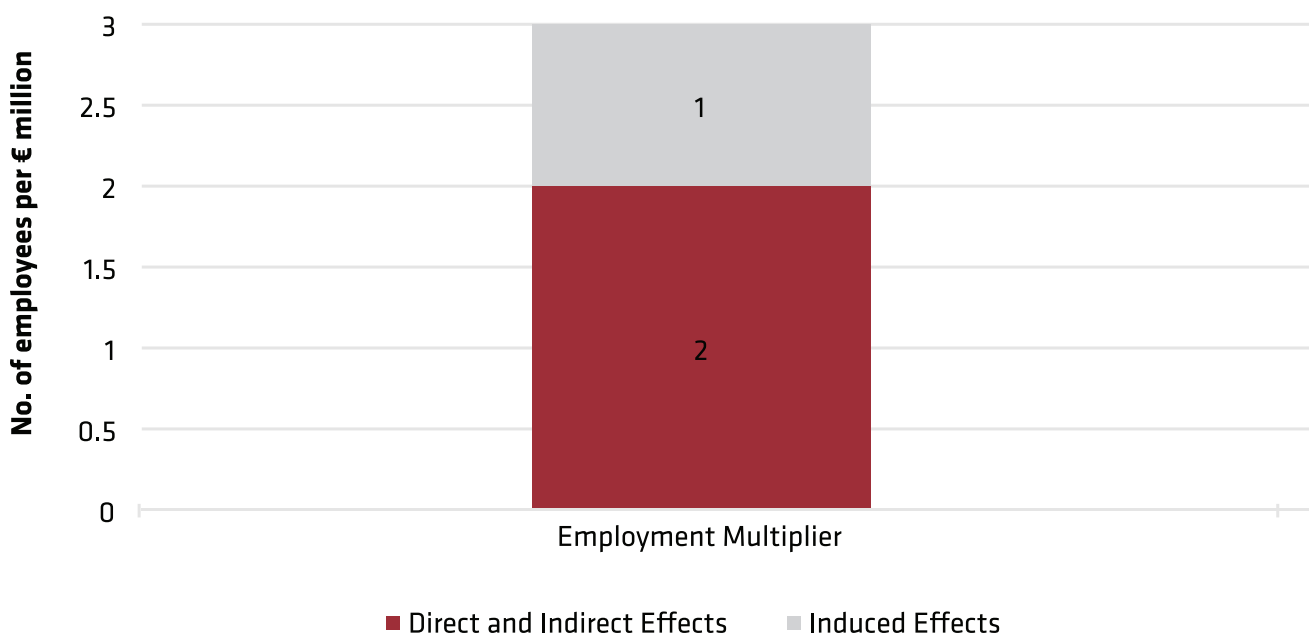
Figure 14 Sector K Total Multipliers



Further to output and value added multipliers, the study also considers income multipliers. The Total income multiplier measures the impact of the direct, indirect and the induced effects, in terms of a Euro worth of new household income generated from a Euro increase in final demand for a sector. It should be noted that on average, the sectors which are more labour intensive tend to generate strong income<sup>5</sup> multipliers.

The Total income multiplier implies that every €1 increase in the final demand of sector K would generate on average an increase of a total of €0.07 in household income. From this total, €0.02 is paid to workers as a result of the induced effects on production.

Figure 15 Sector K Total Employment Multiplier



<sup>5</sup>Income within the context of this report is defined as being composed solely of compensation of employees.

Figure 15 depicts the Total employment multiplier of the aggregate financial services sector (Sector K). This multiplier is also referred to as the physical employment-output multiplier since it assesses the impact that a change in the final demand of a sector generates in terms of the physical amount of jobs created. The estimated employment multipliers have to be assessed in terms of a €1 million worth of change to the final demand of the sector. The Total employment multiplier hence measures the additional physical employment<sup>6</sup> that is generated by the direct, indirect and induced effects on production due to an additional one million worth of final demand for the sector.

The Total employment multiplier for sector K is equivalent to three jobs, thus, on average three new jobs are being created in the economy for every €1 million of additional final demand. Out of these three new jobs created, one results from the induced effects on production.

### 3.1.2 Sector K Accounting Multipliers

The individual Simple and Total multipliers presented thus far estimate the impact on the economy which could result as a consequence of changes in the final demand of a sector. However, as discussed in Section 3.1.1, they do not account for the relative size of the industry or for the amount of final demand which the industry drives throughout the economy via its multiplier effects.

A way in which the derived multipliers can be adjusted to account for both the relative size of the sector as well as for the activity supported by its final demand is through the derivation of what are referred to as base year accounting multiplier measures<sup>7</sup>.

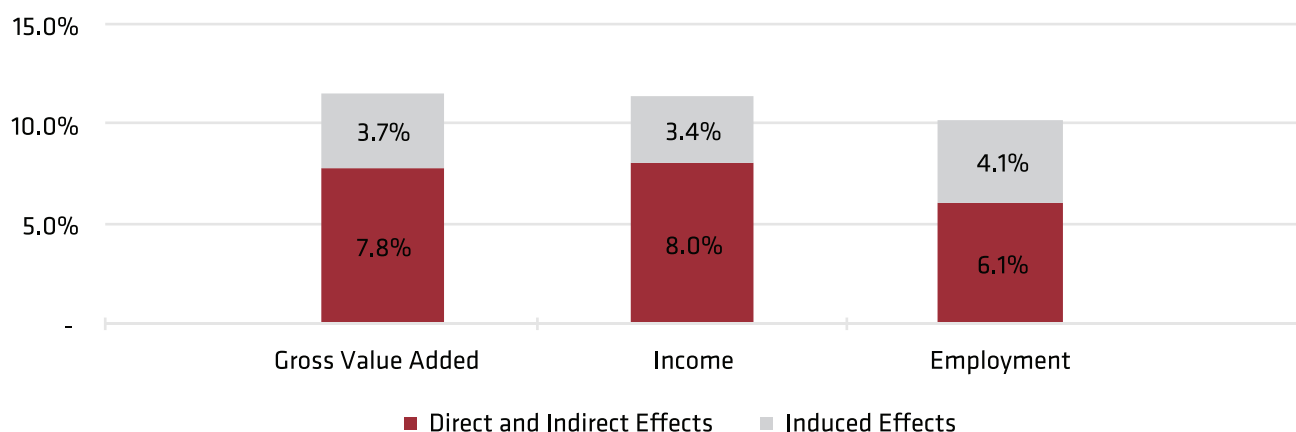
The larger the share of an industry's final demand to total final demand and the higher the magnitude of the industry's multipliers, the larger the resulting base year accounting multiplier.

On the basis of the SIOT for 2010, after taking into account total direct, indirect and induced effects, it is estimated that 11.6% of the total GVA in the economy was produced to satisfy the final demand of the financial services sector, putting the sector with highest ranking contributors of the Maltese economy. As can be seen in Figure 16, from this 11.6% total contribution, 3.7% are attributable solely to the induced effects generated across the economy which result from the additional growth in production caused by the increases in compensation of employees.

Figure 16 Contribution of Sector K to the total economy

The financial services sector has also been estimated to account for 10.2% of the total employment in the economy, with 4.1% being driven solely via induced effects.

Nonetheless, from these accounting multiplier estimates it may be noted that although the sector may have relatively low Simple and Total multipliers, when one accounts for its size, it is clear that it plays a very significant role within the context of the total GVA, income and employment generated within the Maltese economy.



<sup>6</sup> Employment within the context of this analysis follows the LFS full-time equivalent (FTE) definition from Eurostat. FTE is a unit utilised to measure employed persons in a way that makes them comparable even if they work for different number of hours per week.

<sup>7</sup> For an extensive review of this methodology refer to Cassar I.P. (2013).

### 3.2 Sub-Sectoral Multiplier Analysis

This section compares the Total multipliers at a sub-sectoral level. Intra sector comparisons are useful, not only to understand the structural difference across sub-sectors, but more importantly in view of their potential use for policy making.

Figure 17 Intra Sector Comparison of Total Multipliers

	Total Multipliers				Total Accounting Multipliers <sup>1</sup>		
	Output	Value Added	Employment	Income	Value Added	Employment	Income
Sector K	1.17	0.15	3.44	0.07	11.6%	10.2%	11.4%
K64	1.13	0.12	2.77	0.06	8.8%	7.8%	9.0%
K65	1.50	0.70	9.67	0.23	1.3%	0.7%	0.9%
K66	1.65	0.53	13.05	0.25	1.2%	1.1%	1.1%

<sup>8</sup>Percentage of total

Figure 17, compares the Total output, value added, income, employment and accounting multipliers of the three sub-sectors as well as those obtained for Sector K as a whole. The multipliers presented therein show a varying degree of heterogeneity amongst the sub-sectors, with those for sub-sector K64 mirroring quite closely those of the financial sector as whole (Sector K). This is attributable to the dominance of this sub-sector referred to earlier, which is in turn reflective of both the size of the banking institutions licensed in Malta and SPE activity.

Despite its relatively low multipliers, the sheer size of the dominant sub-sector K64 accounts for its significant contribution to the economy at large. Indeed, this sub-sector alone accounts for 8.8%, 9% and 7.8% of total value added, income and employment respectively in the economy.

By looking at the relatively higher Total multipliers estimated for both sub-sectors K65 and K66, these imply higher value added, income and employment in the overall economy for every Euro of final demand generated. For example, the Total value added multiplier of the insurance sector (K65) is about 6 times that of sub-sector K64, whilst in terms of employment and income, sub-sector K66 exhibit multipliers just about 4 times higher. In this respect, the results gleaned from such input-output models can be used for more consistent policy making going forward as well as to run simulations on hypothetical changes to final demand on the sector as a whole or at a sub-sector level.

### 3.3 Extrapolating the total (direct, indirect and induced) GVA contribution of the financial services sector for 2016

In order to put the total accounting multiplier (direct, indirect and induced effects) in a more recent context the contribution of the sector was extrapolated on 2016 data. For the purpose of these estimates two alternative assumptions were considered. In the first scenario it was assumed that between 2010 and 2016 final demand for the financial services sector grew at same rate as its total output from year to year<sup>8</sup>. Whilst in a second scenario, final demand was assumed to grow at the same rate of the sector's GVA. Total GVA (including direct, indirect, induced effects) generated by Sector K in 2016 was estimated under both scenarios and thus the range presented in Figure 18 was obtained.

Given these assumptions, as well as the notion that the underlying demand and supply conditions which underpinned the economy in 2010 might have changed significantly, the results obtained should be interpreted with caution.

<sup>8</sup> This assumption is justified on the basis that, from the SIOT for 2010, exports (a key component of final demand) accounts for 82.4% of total output generated by sector K.

Figure 18 Extrapolation of 2016 GVA contribution based on Total Accounting Multipliers

Year	Total GVA (€ millions)	GVA generated by Sector K (direct effects only) (€ millions)	Total GVA generated by Sector K (direct, indirect, induced effects) (€ millions)	Sector K contribution to GVA
2010	5790	452	670	11.6%
2016	8690	598	791-886	9.1% - 10.2%

Based on these calculations, the financial services sector was estimated to have generated between €791 and €886 million of gross value added (GVA) in 2016. This would represent significant increase since the 2010 level. Despite this, Sector K's contribution to total GVA appears to have declined slightly, from 11.6% in 2010 to an estimated 9.1-10.2% in 2016. This is due to the faster expansion in total GVA over the period, which grew by 50% over the six years.

# 4. SUMMARY OF THE MAIN FINDINGS AND CONCLUSIONS

This report attempted to shed light on various important characteristics of the financial services sector, both at an aggregate level as well as in view of its sub-sectoral composition. The official SIOT 2010 data paints a picture of a sector that, although exhibiting relatively low multipliers, is a major contributor to the economy when all economic effects are taken into account. In fact, the sector as a whole has been estimated to account for a very significant 11.2% of total GVA and 10.2% of employment, ranking with the highest contributors of the Maltese economy.

The analysis shows also the sector as a major purchaser of domestic inputs for some sectors, accounting for example to 12.3% and 7.4% of the total domestic sales of security and office administration and legal and professional services respectively. At the same time, it is also a major supplier of inputs to other sectors in the economy, such as the gambling and creative arts sector as well as that of rental and leasing activity.

At a sub-sectoral level, the financial services sector is shown to be dominated by sub-sector K64, although the multipliers for the other two sub-sectors (K65 and K66) resulted to be higher. For instance, basing solely on the multipliers derived from the SIOT 2010, and hence ignoring any scale effects, the impact of a €1 increase in final demand for insurance services (K65) translates in an impact on GVA that is six times bigger than that of the core financial activities sub-sector (K64). These sub-sectoral characteristics could be seen as useful to policy making.

Basing on the structural composition of the sector, the very high import content (96% of intermediate consumption) is a main distinguishing feature, which also hints to its potential for future growth. The analysis points also to the additional employment potential by targeting the specific areas of expertise that are currently not being satisfied by local firms and are being imported instead.

This study has also highlighted the value of the use of input-output analysis to quantify realistic targets, goals and risk appetite for future growth in the sector going forward.



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# APPENDIX A

## OVERVIEW OF THE INPUT-OUTPUT METHODOLOGY<sup>9</sup>

Input-Output models are a class of models known as deterministic models which, through the application of mathematical techniques and the use of a Symmetric Input Output Table (SIOT), allow for a vast range of analytical studies to be carried out. A key contribution of this class of economic analysis is that the estimates generated take account of not only the direct and indirect effects but also the induced effects occurring within the production structure.

The input-output model utilized for the analysis undertaken in this report is the Leontief demand driven model. The application of this model required the use of a symmetric input-output table for the Maltese economy. Hence the results and analysis presented are based on the SIOT for Malta 2010, which was published by the NSO in May 2016.

The solution to the balance equation of the Leontief demand driven model requires the derivation of the Leontief inverse matrix. It is through this matrix that the sectoral multipliers are obtained demonstrating the effects on the production (income, value added and employment), across all sectors of the economy, as a result of the increase in final demand of a specific industry.

The study presents the analysis of both Simple (also known as Type I) and Total (Type II) output, income, value added and employment multipliers. Simple multipliers are obtained from the open Leontief demand driven model which employs an inter-industry transaction table constituted solely of industries. The derived Leontief inverse matrix from a simple model would illustrate the direct and indirect multiplier effects. These multiplier estimates acknowledge the fact that an increase in demand for a sector's output has a greater impact on the economy than just the direct effects since there are wider knock on effects on other industries.

Simple output multipliers may be viewed as an important indicator of the degree of structural interdependence between industries in the economy. One of the key factors influencing their overall strength relates to the relative share of leakages from the domestic inter-industry system. Hence, the larger the import content within the production process of a sector, the smaller the magnitude of the resultant multipliers for that industry.

Total multipliers, obtained from a closed Leontief demand driven model, allow the model to capture the behaviour of households within the economic system, which, in addition to the direct and indirect effects, reflects what are known as induced effects. These induced effects account for the additional growth in production caused by the increases in compensation of employees. This in turn causes further spending and production spurred on by the initial increase in final demand. Therefore, over and above the same factors which determine the size of Simple multipliers, a factor which also affects the size of Total multipliers relates to the income -expenditure pattern of households.

Furthermore, the Simple and Total sectoral multipliers defined above can be adjusted to account for both the relative size of the sector as well as for the activity supported by its final demand. This is done through the derivation of base year accounting multiplier measures, which are also presented in this study. The derivation of such measures allows for the estimation of the total contribution to the Maltese economy in terms of the direct, indirect and induced effects that the financial services sector generates.

The larger the share of an industry's final demand to total final demand and the higher the magnitude of the industry's various multiplier measures, the larger the resulting base year accounting multiplier measure. These measures can therefore be utilised to shed light on the relative importance of a given sector within the context of the entire production structure of an economy.

These multiplier estimates obtained in this study were derived by following the same methodology presented in Cassar I.P (2015).

<sup>9</sup> For a detailed explanation see Leontief, W. (1941).

### *Key assumptions within standard input-output multiplier analysis*

When analysing the results from the input-output model, careful consideration must be given to the underlying assumptions of such a model. The following assumptions are inherent in the application of the Leontief demand driven model utilized to derive the Simple input-output multipliers and have therefore been applied in this study.

The main assumptions can be summarized as follows:

- Technical coefficients are fixed, hence input substitution is not allowed (i.e. fixed proportions exist in all production processes);
- There are no input constraints, thus supply of inputs is assumed to be infinite;
- Production in every industry is subject to constant returns to scale;
- Output is a linear function of final demand;
- Each industry is assumed to produce one homogenous product.

The derivation of Total multipliers, which allow for the estimation of induced effects require the further assumption of fixed income-expenditure patterns of households.

Given that this study presents an analysis of income, value added and employment (physical employment) multipliers which show the impact that additional spending may generate in terms of increased household income, value added or in terms of jobs created, the following additional modelling assumptions should also be noted:

- Fixed labour input coefficients. This effectively means that amount of labour income per Euro of output produced for each specific sector is constant
- Fixed value-added coefficients. Hence, the amount of value-added generated per Euro of output produced for each specific sector is constant
- Fixed employment output ratios. In other words, the numbers of (average) jobs per million Euro of output produced for each specific sector is constant.

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