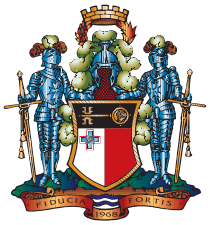

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THE CONTRIBUTION OF THE CONSTRUCTION AND REAL ESTATE SECTOR IN MALTA

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BOX 1: THE CONTRIBUTION OF THE CONSTRUCTION AND REAL ESTATE SECTOR IN MALTA[1]

This box assesses the direct role of the construction and real estate sector in Malta, as well as their indirect effects and linkages with other sectors. The note concludes with an estimation of the impact on the economy's GVA of a 10% increase in the final demand of these sectors.

Direct shares in value added and employment

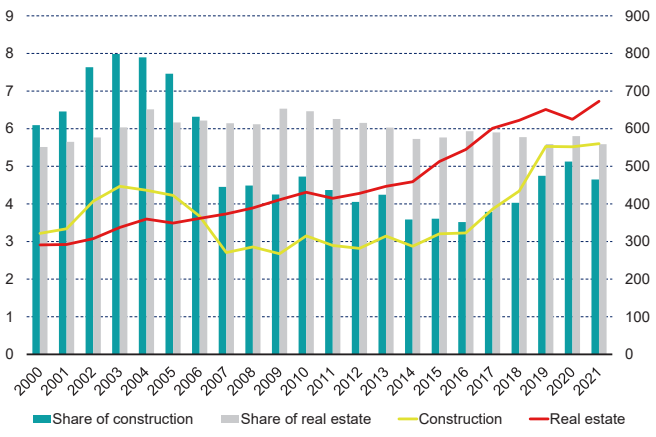
According to national accounts data, real GVA in the construction sector stood at €560.1 million in 2021, up from €321.7 million in 2000 (see Chart 1).[2] At the same time, the GVA in the real estate sector stood at €672.8 million, up from €291.0 million in 2000.

Since 2006, the GVA level of the real estate sector has exceeded that of construction. Indeed, while the share of construction in total GVA declined from 6.1% in 2000 to just 4.7% in 2021, that of real estate increased slightly from 5.5% to 5.6%. In total thus, the share of the construction and real estate stood at around 10.2% of total GVA in 2021, down from 11.6% in 2000.

In terms of contributions to growth, on average, during the period 2014-2021, both the construction sector as well as the real estate sector, each contributed annually 0.3 percentage point to total GVA growth (see Table 1). When compared to other sectors in the economy, the construction and real estate sectors thus had a modest contribution to growth during this period. Indeed, services-related sectors such as the professional and administrative sector, as well as the information and communication sector, were the main drivers of growth during the period 2014-2021.

As regards employment, according to national accounts data, the construction sector employed around 17,100 persons in 2021, while the real estate sector employed around 3,400 persons. Both sectors added substantially to employment levels over the period 2000 to 2021.

Chart 1
GVA OF THE CONSTRUCTION & REAL ESTATE
(per cent; EUR thousands in chain-linked volumes)



Sources: NSO; authors' calculations.

[1] This box was prepared by Ian Borg and Noel Rapa, the Manager of the Economic Projections and Conjunctural Analysis Office, and the Modelling Office, respectively.
[2] This analysis is based on the Q3 2022 vintage of the national accounts and is thus consistent with NSO *News Release* 218/2022.

Table 1
CHAIN-LINKED CONTRIBUTIONS TO OUTPUT GROWTH
Percentage points; subperiod averages

	2001-2006	2007-2013	2014-2021
Agriculture, forestry and fishing	0.2	-0.1	0.1
Industry (excl. construction)	-0.7	0.2	0.3
of which: Manufacturing	-0.6	0.4	0.1
Construction	0.2	-0.1	0.3
Wholesale and retail trade; vehicle repair	-0.5	0.8	0.7
Information and communication	0.3	0.4	1.0
Finance and insurance activities	0.6	0.4	0.5
Real estate activities	0.2	0.2	0.3
Professional, scientific and technical activities	0.5	1.0	1.4
Public administration and defence; education, health and social work activities	0.4	0.4	0.7
Arts, entertainment and recreation	0.4	0.6	0.6
GVA (% growth)	**1.7**	**3.6**	**6.4**

Sources: Eurostat; authors' calculations.
Notes: Output is defined as chain-linked GVA.

The construction sector added around 7,400 persons, while the real estate added around 3,000 jobs.

Over the period 2014-2021, the construction sector directly accounted for 5.9% of total employment (see Table 2). This share has declined when compared to the period prior to 2014. Meanwhile, the real estate sector employed 1.0% of total employment during this period. When compared to the other main sectors within the economy, the construction sector was the fourth smallest in 2021, whereas the real estate sector has the second lowest share.

Table 2
SHARES OF TOTAL EMPLOYMENT
Period averages of shares

	2000-2006	2007-2013	2014-2021
Agriculture, forestry and fishing	1.5	1.5	1.1
Industry (excl. construction)	22.3	15.8	11.3
of which: Manufacturing	*19.3*	*13.7*	*10.3*
Construction	6.9	6.9	5.9
Wholesale and retail trade; vehicle repair, transport, and accommodation	28.3	27.6	26.3
Information and communication	2.6	3.1	4.0
Finance and insurance activities	4.0	5.4	5.3
Real estate activities	0.3	0.6	1.0
Professional, scientific and technical activities and admin	6.8	9.7	14.8
Public administration and defence; education, health and social work activities	24.0	24.5	24.0
Arts, entertainment and recreation, and other	3.4	4.7	6.4

Sources: Eurostat; authors' calculations.

Indirect and induced effects, and linkages with other sectors

The importance of a given sector within the economy is not only driven by its size relative to the other sectors. Another consideration is the extent to which a sector is interconnected with the rest of the economy. In this context, Input-Output-based analysis provides a consistent way to compare the interconnectedness of a given sector with the rest of the economy. This through a number of concepts that take in consideration both direct and indirect links that exist across sectors within an economy.

The first way to conceptualize this is by looking at the demand-driven Leontief multipliers. We can refer to two types of demand-driven multipliers, the Simple (Type I) multipliers and the Total (Type II) multipliers. For each type of multiplier one can measure either output, value added, employment or income multipliers. The Simple (Type I) *output* multiplier of a sector measures the sum of direct and indirect input requirements from all sectors, which are needed to supply 1 Euro worth of sector 'j's' output to final demand. In contrast, the Total (Type II) *output* multiplier, also captures induced effects, that is the positive demand effects emanating from the increases in households' disposable income that create further rounds of demand increases through private consumption. While *output* multipliers are useful to measure the interconnectedness of a sector, more policy relevant variants of multipliers relate to the value added, employment and income multipliers as these are more directly related to actual economic well-being. In this section we provide a summary of both Simple and Total multipliers measured in terms of output, value added, employment and income for the "Mining, Quarrying and Construction" and "Real estate activities" sectors. As in all other estimates presented in this subsection, these estimates are consistent with the latest symmetric input-output tables (SIOT) for Malta, that is those for 2015.

As argued briefly above, while output multipliers are included in the analysis, we will focus on the results pertaining to Income, Value added and Employment multipliers as these have a much clearer interpretation from a policymakers perspective.[3] The Simple (Type I) value added multiplier for the "Mining, quarrying and construction" sector stands at 0.5, implying that a 1 EUR increase in final demand of this sector leads to a 0.5 EUR increase in aggregate value added, when taking in consideration both direct and indirect effects (see Table 3). When internalizing induced effects, this amount goes up to 0.8 EUR. This

Table 3
DEMAND-DRIVEN MULTIPLIERS
Value in EUR; rank out of 40 sectors

Simple (Type I) Multiplier	Output		Income		Value Added		Employment	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Mining and quarrying and construction	1.8	4.0	0.3	26.0	0.5	28.0	13.2	22.0
Real estate activities	1.4	17.0	0.1	39.0	0.8	11.0	3.6	38.0
Total (Type II) Multiplier	**Output**		**Income**		**Value Added**		**Employment**	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Mining and quarrying and construction	2.3	14.0	0.3	26.0	0.8	27.0	18.1	23.0
Real estate activities	1.6	37.0	0.1	39.0	0.8	21.0	5.1	38.0

Sources: NSO; authors' estimate.

[3] In Input Output terminology, output is the sum of all final and intermediate demand components including direct and indirect imports. To this extent, value added is a concept which is much closer in its definition to GDP.

ranks the “Mining, quarrying and construction” sector 28th and 27th out of 40 sectors when looking at the value-added effects of a 1 EUR increase in its final demand. A similar stimulus is expected to raise total income levels by 0.3 EUR (when looking at both Simple and Total multiplier concepts) and increase employment levels by 13 heads (when including only direct and indirect effects), and 18 heads (when also including induced effects). This ranks the “Mining, quarrying and construction” sector between the 22nd and 26th place when compared to the effects of similar increases in final demand components of other sectors within the economy.

Another useful concept in measuring the importance of a sector in the economy is Key Linkages Analysis. Key Linkages Analysis expands over multiplier analysis in two main ways:

1. Multiplier analysis is only concerned with the linkages of a sector with the rest of the economy abstracting from the actual size of the sector. Linkages analysis takes in consideration links and size of the sector in question.

2. Multiplier analysis is only concerned with backward linkages – a sector is deemed as important if it requires a large amount of intermediate demand which is supplied by other sectors. Linkages analysis measures both upstream and downstream effects, thus taking in consideration both forward and backward linkages. Thus, linkages analysis allows to capture the fact that a sector can be important either if it requires intermediate inputs from other sectors (backward linkages), or if its output is important to the production of the output of other sectors (forward linkages).

On the other hand, it is important to keep in mind that in Key Linkages Analysis, linkages are estimated in terms of total aggregate output loss following the suspension in the activities of a given sector. In this respect, this analysis suffers from issues relating to the definition of output within in an input-output framework.

In literature, there are three main methods that can be used to compute linkage analysis. In all three methods, a sector is said to possess key linkages with the rest of the economy if the output loss following the suspension in activities of the sector exceeds the average output loss following the suspension in the activities of the other sectors. In the interest of space, this note will only be looking at forward and backward linkages as estimated by the methodology suggested in Dietzenbacher and van der Linden (1997).[4]

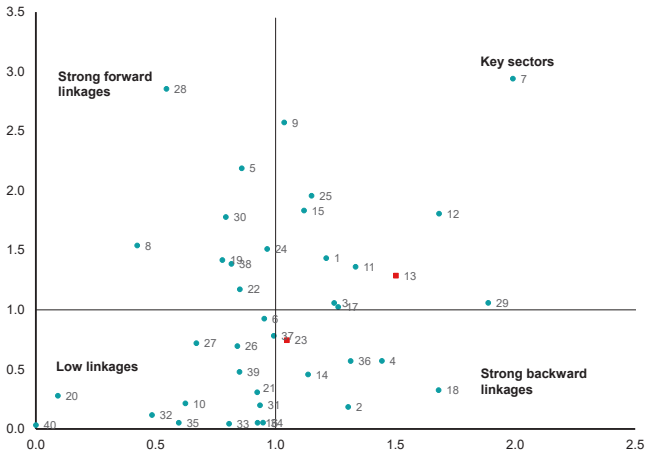
Chart 2 shows normalised[5] linkage indicators for all 40 sectors available in the SIOT of 2015. Results show that sector 13, “Mining, quarrying and construction” has higher than average forward and backward linkages, implying that the sector is important both downstream (given the importance of its output as intermediate supply for other sectors) and upstream (given the considerable demand this sector has for intermediate production produced by other sectors in the economy). In particular, with respect to backward linkages, the “Mining, quarrying and construction” sector is very dependent on output produced in sectors 7 “Manufacture of

[4] Linkages estimated using the other two methods lead to similar results.

[5] Normalisation of linkages implies that each sectoral result is expressed in terms of the average linkage value for the whole economy. This implies that any sector with a linkage value which is larger than one has higher than average linkages.

other non-metallic mineral products", 15 "Wholesale trade, except of motor vehicles and motorcycles", 25 "Architectural and engineering activities; technical testing and analysis" and 9 "Manufacture of fabricated metal products, except machinery and equipment".

Chart 2
NORMALISED LINKAGE INDICATORS – NC METHOD



Source: Authors' calculations.

Downstream, "Mining, quarrying and construction" has important linkages to sector 7 "Manufacture of other non-metallic mineral products", 17 "Land transport and transport via pipelines, water transport, air transport, warehousing and support activities for transportation and postal and courier activities", 18 "Accommodation and food service activities" and 23 "Real estate activities", implying that sector 13 is an important supplier of intermediate production that is used to fulfil output of all these sectors.

On the other hand, sector 23 "Real Estate Activities" has higher than average backward linkages but below average forward linkages implying that it is more important as a user of intermediate output rather than a supplier to other sectors in the economy.

In a hypothetical scenario, we assume a 10% increase in the final demand of the "Mining, quarrying and construction" and "Real estate activities" sectors, equivalent to around twice the actual growth experienced in these two sectors between 2021 and 2020. Using a Leontief demand-driven model (which captures only backward-looking linkages), this creates between 0.9% (when considering direct and indirect effects) and 1.1% (when also internalizing induced effects) increase in aggregate GVA.[6]

Table 4 shows that the indirect effects of an increase in the final demand for the construction industry leads to significant expansions in the GVA of "Manufacture of other non-metallic mineral products", "Manufacture of fabricated metal products, except machinery and equipment" and "Architectural and engineering activities; technical testing and analysis" sectors. These results mirror the arguments put forward in the multiplier and Key Linkage analyses discussed above.

To summarize, the "Mining, quarrying and construction" and "Real estate activities" sectors have high output but medium-to-low value-added, income and employment multipliers,

[6] All sector specific GVA multipliers are lower than one. To understand this, it is important to note that the total output of any particular sector meets two types of demands, final and intermediate demand. Therefore, when shocking the final demand of a particular sector we are shocking only a part of the sector's demand implying that only part of the total amount of GVA used to meet the total demand of a sector is being stimulated, resulting in a sector-specific multiplier which is lower than one.

Table 4
TOP 10 SECTORAL GVA CHANGES – 10% INCREASE IN DEMAND OF CONSTRUCTION AND REAL ESTATE

% deviation from baseline

	GVA	Employment (Head count)
Real estate activities	7.8	244
Mining and quarrying and construction	7.29	1,166
Manufacture of other non-metallic mineral products	5.64	78
Manufacture of fabricated metal products, except machinery and equipment	2.93	44
Architectural and engineering activities; technical testing and analysis	1.88	69
Manufacture of basic metals	1.18	1
Manufacture of wood except furniture	1	1
Wholesale trade, except of motor vehicles and motorcycles	0.79	90
Repair of computers and personal and household goods	0.39	2
Repair and installation of machinery and equipment	0.37	7

Sources: NSO; authors' estimate.

ranking between 22nd and 39th out of the 40 sectors under consideration. Despite the relatively low multiplier results, the construction sector is regarded to have above average linkages with the rest of the economy, with the "Mining and quarrying and construction" sector scoring above average forward and backward linkages and "Real estate activities" sector having slightly above average backward linkages. These figures imply that a 10% increase in the final demand of the two sectors raise overall GVA by almost 1% with significant effects on the GVA of the "Manufacture of other non-metallic mineral products", "Manufacture of fabricated metal products, except machinery and equipment" and "Architectural and engineering activities; technical testing and analysis" sectors.

Overall, this analysis shows that although the direct share of construction and real estate in the economy has diminished over time, the two sectors still feature significant linkages to the rest of the economy. This is particularly the case for the 'mining, quarrying and construction' sector, which features stronger than average backward and forward linkages. However, the value-added multiplier of this sector ranks low when compared to other sectors of the economy, mainly due to a lower proportion of value added in its output.

The "Real estate activities" has higher than average backward linkages but relatively low forward linkages. The former is reflected in a relatively high rank in the sector's type I value added multiplier, which ranks 11th out of 40 sectors considered.