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DEVELOPMENTS IN THE MANUFACTURING SECTOR

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BOX 1: DEVELOPMENTS IN THE MANUFACTURING SECTOR[1]

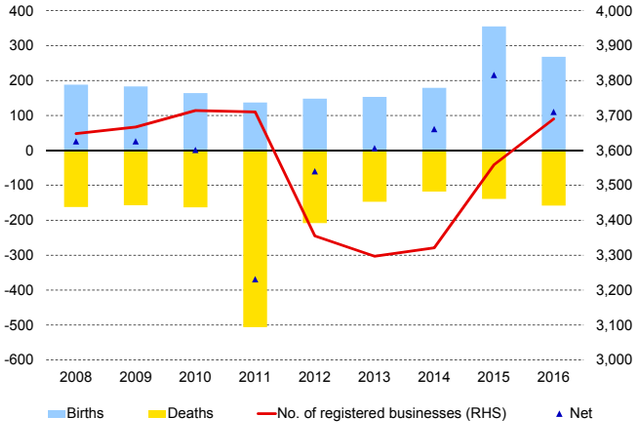
The manufacturing sector has been instrumental for Malta's economic progress since Independence. The sector has been gradually transformed from a low cost sector into one producing higher value added products. The objective of this Box is to better understand the key trends and developments in the manufacturing sector since the mid-1990s by looking at different sources of data, including business demographics, activity, input-output analysis and survey information.[2]

Activity indicators

Business demographic data published by the National Statistics Office (NSO) shows that the number of registered legal entities specialising in manufacturing stood at 3,690 in 2016, accounting for slightly less than 4% of the total business units registered for the whole economy.[3] Around 92% (3,395 units) of manufacturing firms were micro-enterprises, accounting for 22% of total employment in the sector.[4] More than 7% of the firms were considered as small and medium enterprises (SME) which together offered slightly more than half of the jobs in the sector. The rest were large enterprises, generating 27% of total manufacturing employment. Compared with the rest of the economy, the distribution of firms in the manufacturing sector is skewed slightly more towards SMEs, while the share of micro enterprises is slightly smaller.

Data on the number of births and deaths of manufacturing units show that since 2013 the number of new registered businesses was higher than that of deregistered units (see Chart 1). In 2016, the number of births stood at 268 units, while only 158 units were deregistered, giving a net increase of 110 units. Notwithstanding growth in the sector recently, the number of registered businesses

Chart 1
BIRTHS AND DEATHS OF MANUFACTURING BUSINESSES
(number of business units)



Source: NSO.

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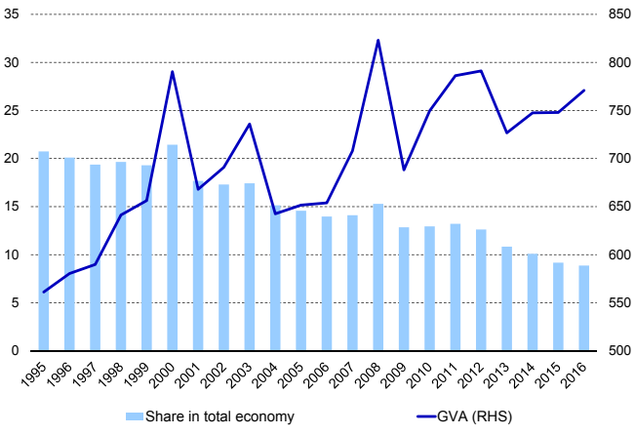
[2] National accounts data in this Box are sourced from NSO *News Release* 041/2017. The definition of manufacturing and its sub-sectors is based on Eurostat's NACE Rev 2 classification.

[3] Business demographic data from 2011 exclude units with a turnover of less than €7,000, in line with a new VAT Regulation that came into force on 1 January 2011, as notified in Legal Notice 524 of 2010. Therefore data from 2011 onwards may not be strictly comparable with previous years. Additionally, data from 2015 might include new or re-activation of registrations according to another new VAT Regulation that came into force on 1 January 2015, as notified in Legal Notice 67 of 2015.

[4] According to the NSO *News Release* 075/2017 on business demographics, micro-enterprises are considered to employ nine or less employees. Small enterprises hire between 10 and 49 employees, while medium enterprises engage between 50 and 249 employees. Units employing 250 or more employees are considered as large businesses.

remains slightly below that registered in 2010.[5]

Chart 2
GROSS VALUE ADDED OF THE MANUFACTURING SECTOR
(per cent; EUR millions)



Source: NSO.

Statistics on GVA show that activity in the manufacturing sector has been quite volatile in recent years with relatively strong dips in 2001, 2004, 2009 and 2013 (see Chart 2). The decline in 2001 coincided with the mild recession in Malta, which followed the burst of the information technology bubble that reduced foreign demand for electronic components. Weak export growth largely also explains the 2004 dip as domestic firms became exposed to higher competition in the run-up to EU membership. Those manufacturing firms oriented towards the local market were also adversely affected during this period due to increased competition. Subsequently, the manufacturing industry was negatively affected by the 2009 global financial crisis. The recovery in the following years was interrupted in 2013, largely reflecting industry-specific factors that affected the semiconductor industry in Malta. Since then, GVA in manufacturing began to edge up again, albeit very slowly, such that in 2016 it was still below the most recent peak recorded in 2012. As other sectors of the economy – particularly services – recorded much faster growth, the share of manufacturing in total economy GVA has been trending downwards, standing at around 9% in 2016, from almost 21% in 1995.

Notwithstanding this relative decline, manufacturing remains an important sector for the Maltese economy. Although it is smaller than fast-evolving services sectors, such as those incorporating professional and business activities along with arts and entertainment (mainly influenced by i-gaming), in 2016 it registered a higher level of GVA than the financial and insurance business sector as well as that incorporating information and communication.

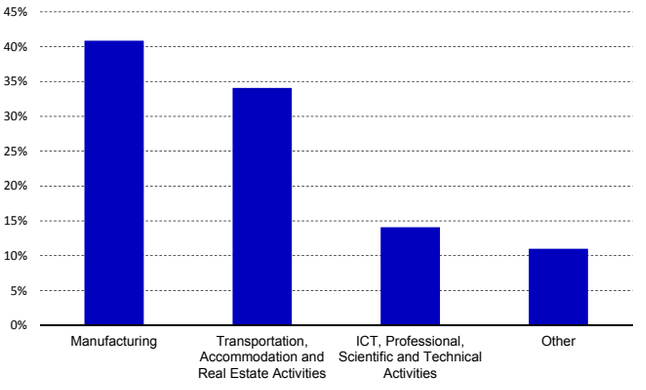
Moreover, the manufacturing sector remains one of the largest recipients of foreign direct investment (FDI) flows (after excluding flows associated with the financial sector). For instance, since 2014, around 41% of FDI inflows were directed to the manufacturing sector (see Chart 3).

The manufacturing industry also has important linkages with other sectors of the economy. The latest input-output tables for the manufacturing sector, relating to 2010, show that in generating output worth €2.5 billion, the manufacturing sector utilised around €1.7 billion in

[5] It should be noted that as a result of Legal Notice 524 of 2010, which exempted relatively small suppliers from registering for VAT purposes, in the subsequent year there was a spike in deregistrations of firms across all sectors.

domestically produced inputs and imports (see Table 1).[6] This implies a very high import content, of almost 70% of total intermediate consumption. Only circa a third of the total intermediate consumption generated by manufacturing was sourced domestically.

Chart 3
AVERAGE SHARE OF FDI INFLOWS BY ECONOMIC SECTOR(1) (2014-2016)
(per cent)



(1) Excluding financial and insurance activities.
Sources: NSO; Author's calculations.

Over half of the domestically-sourced inputs in 2010 were sourced from the services sector, particularly the distributive trades, financial and insurance sectors. The manufacturing sector itself supplied €94 million (19%) with a further €76 million of locally-sourced inputs (15%) from the energy provider and other utilities. Links with the construction sector were less significant, with the latter accounting for only around €21 million, representing 5% of the domestic inputs going into manufacturing processes.

Estimates of forward linkages by the Central Bank of Malta across various sectors show that the manufacturing sector is an important source of supply to other sectors within the Maltese economy.[7]

Table 1
DISTRIBUTION OF INTERMEDIATE CONSUMPTION FOR THE MANUFACTURING SECTOR, 2010
EUR millions

	2010
Output at basic prices	**2,481**
Total Intermediate Consumption	**1,731**
of which:	
Domestic Production	0
Agricultulture, forestry and fishing	35
Mining and quarrying; utilities	76
Manufacturing	94
Construction	21
Services	277
Imported Products	1,220
Taxes less subsidies on products	8
Gross value added at basic prices	**750**

Source: NSO.

[6] The latest *Supply, Use and Input-Output Tables* (SUIO) are available at https://nso.gov.mt/en/nso/Media/Salient-Points-of-Publications/Pages/Supply-Use-and-Input-Output-Tables.aspx (published in May 2016). Note that the aggregate values for the manufacturing sector quoted from the SUIO tables are consistent with the news release published in 2014 (195/2014). Therefore these figures should not be compared to the rest of the data being used in this article.

[7] Refer to Claus, I. (2002), *Inter industry linkages in New Zealand*, New Zealand Treasury for the methodology of forward linkages.

Table 2
DISTRIBUTION OF THE MANUFACTURING OUTPUT IN THE ECONOMY, 2010

EUR millions

	2010
Intermediate demand	**463**
Final demand	**2,018**
of which:	
Final consumption	239
Gross capital formation	88
Exports	1,691
Output at basic prices	**2,481**

Source: NSO.

Table 2 shows that slightly more than four fifths of the manufacturing output generated during 2010 was final demand, primarily as exports (68%). Final consumption and gross capital formation represented 9.6% and 3.5% respectively of the final demand recorded. Almost 20% of the manufacturing output in 2010 was utilised as intermediate demand in the economy, partly within the same sector.

A recent study by the Central Bank of Malta calculated industry-specific multipliers on the basis of the demand driven input-output framework using 2010 data.[8] The study puts forward a new set of Type I and Type II multipliers for the Maltese economy, including disaggregated sectors in the manufacturing industry.[9] In addition, the study presents the accounting multipliers, which go a step further as they account also for the size of the sector generating the final demand (see Table 3).[10]

The manufacturing sector as a whole has the highest income, value added and employment multipliers and the second highest output multipliers. Disaggregated data shows that the firms within the electronics sector (C26-C32) registered the highest ranking in the output, value added, income and employment multipliers. This implies that changes in the final demand recorded in the electronics sector, create strong direct and indirect effects. In 2010, the electronics sector generated almost 45% of the value added in manufacturing and slightly more than 5% of the total economy.

Another recent study, also based on input-output analysis, estimated the impact on the Maltese economy in the hypothetical scenario of an extraction of a particular sector, given its backward and forward linkages with the other sectors of the economy.[11] In 2010, due to its linkages with other sectors of the economy, the manufacturing sector still generates

[8] This study was published in Rapa, N. (2017), "Estimates of industry specific multipliers", *Quarterly Review* 2017(2), pp. 19-23, Central Bank of Malta.

[9] Type I multipliers capture the direct and indirect effects (on output, income, value added and employment) of an increase in final demand of a particular industry on all the sectors of the economy. The direct effect refers to the increase in output of the particular product following a rise in its final demand. For the producers to increase their output, they will demand more from their suppliers, and this goes on throughout the supply chain. The latter is referred to as the indirect effect. Type II multipliers also include induced effects, which capture the impact of the household sector's savings and consumption patterns.

[10] Refer to Appendix 1 for the statistical classification of economic activities within the manufacturing sector.

[11] Cassar, I. (2017), "Assessing structural change in the Maltese economy via the application of hypothetical extraction analysis", Working Paper 01/2017, Central Bank of Malta. Hypothetical extraction is a method whereby a particular sector is extracted (or removed) from the economy in order to analyse the impact of this extraction on the other sectors of the economy.

Table 3
ACCOUNTING MULTIPLIERS FOR SPECIFIC SECTORS OF THE ECONOMY

Per cent of total

	Accounting Multipliers			
	Output	Income	Value Added	Employment
Selected sub-sectors of the manufacturing sector:				
Manufacture of food products, beverages and tobacco products (C10-C12)	2.0	2.0	1.9	2.3
Manufacture of paper and paper products, printing and reproduction of recorded media, manufacture of coke and refined petroleum products, chemical products, basic pharmaceutical products and pharmaceutical preparations and rubber and plastic products (C17-C22)	2.7	3.2	3.4	2.9
Manufacture of computer, electronic and optical products, electrical equipment, machinery and equipment n.e.c., motor vehicles, trailers and semi-trailers, other transport equipment and of furniture; other manufacturing (C26-C32)	8.4	6.0	6.8	6.1
Selected industries:				
Mining and quarrying and construction	5.3	5.2	5.5	6.2
Manufacturing	14.9	13.7	14.1	14.2
Wholesale and retail trade; repair of motor vehicles and motorcycles	6.0	8.8	9.3	10.6
Other professional, scientific and technical activities; veterinary activities; advertising and research	0.4	0.3	0.3	0.3
Education	2.4	10.0	5.7	9.3
Accommodation and food service activities	6.2	7.7	7.0	10.8
Arts, entertainment and recreation	10.4	4.5	9.6	3.7

Source: Rapa, N. (2017).

the largest hypothetical extraction effects in terms of GVA, labour income and employment among all the other sectors. That said, these extraction effects have been declining over time reflecting the sectoral diversification of the economy and the shift towards services.

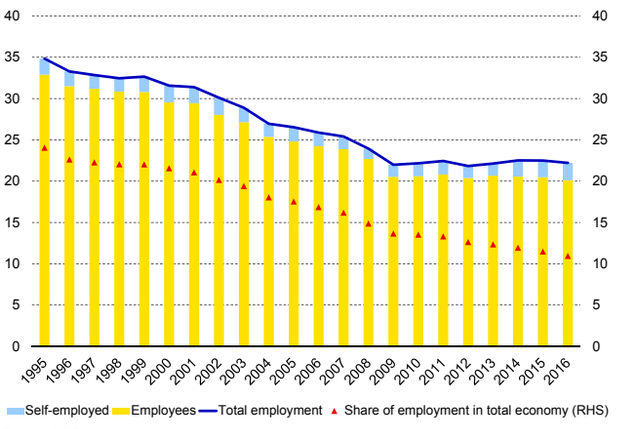
Employment, wages and productivity in the manufacturing industry

After a trend decline from the mid-1990s, employment in the manufacturing sector remained relatively stable after 2009 (see Chart 4). This contrasts with the situation in the euro area, where this sector continued to record steady declines up to 2013. In 2016, employment in Malta's manufacturing industry stood at 22,214 persons, accounting for 11% (compared with 24% in 1995) of the whole economy's employment. This sector remains the second most important employer in Malta. The decline in the sector's share in GVA was thus unsurprisingly also reflected in employment data.

The majority of persons employed in the sector are employees. For 2016 this figure stood at 20,123, equivalent to around 91% of all job holders in the industry. There were also 2,091 self-employed persons, equivalent to around 9% of total employment in industry.

This share is comparable to that in the other sectors of the economy combined.

Chart 4
EMPLOYMENT DISTRIBUTION IN THE MANUFACTURING INDUSTRY
(thousands; per cent)



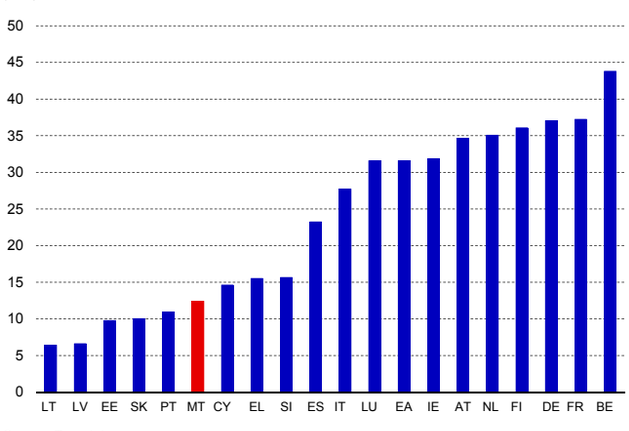
Source: NSO.

Similar to the situation in other sectors of the economy, labour shortages led to an increased reliance on foreign workers. Jobsplus data shows that at the end of 2016, the manufacturing sector employed more than 2,300 foreigners, with around two-thirds of them being EU nationals.[12] The share of foreigners in manufacturing, however, remains lower than for the total economy. The share of foreign workers in manufacturing increased from around 4% of the workforce in 2012 to 10% in 2016. Most of the increase registered took place after 2012.

The Labour Cost Survey shows that the salaries and wages in the manufacturing sector stood at around €13 per hour in 2016. Chart 5 shows that labour costs in the domestic manufacturing sector still remain lower than in most euro area countries, even when compared with those that were severely affected by the crisis (such as Spain and Italy).

Average wage growth has been relatively stable since 2011, averaging around 2.6% per annum. In 2016, compensation per employee in the manufacturing sector stood at €20,966 compared with €23,317 for the whole economy. Average compensation in manufacturing was lower than that in fast growing services-oriented sectors, such as financial services, ICT and i-gaming. On the other hand, the manufacturing sector offers a higher compensation than the construction and the wholesale and retail sector.

Chart 5
AVERAGE LABOUR COST PER HOUR IN THE MANUFACTURING SECTOR BETWEEN 2012 AND 2016
(EUR)



Source: Eurostat.

The manufacturing sector is highly heterogeneous, both in terms of productivity and wages. The pharmaceutical industry registered the highest levels of

[12] In addition to the manufacturing sector, this figure includes foreigners employed in quarrying and utilities.

productivity, measured as GVA per worker, which was comparable to those registered in high value added services sectors. Similarly, compensation per worker in the pharmaceutical industry was significantly higher than the sector's average. Other sectors that are characterised by higher productivity include those producing electrical equipment, beverages, motor vehicles, repair and installation and printing. Meanwhile, productivity and compensation per employee were the lowest in firms producing wearing apparel, textiles and leather products.

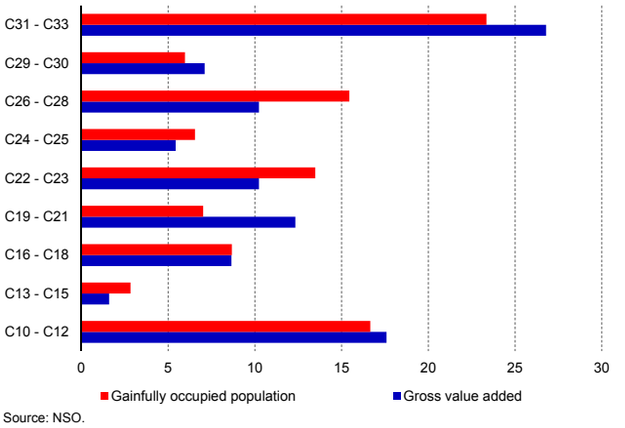
Changes in the composition of the manufacturing sector

Disaggregated national accounts data[13] shows that the biggest sub-sector in terms of GVA within the manufacturing industry in 2016 was related to activities of furniture manufacturing, other manufacturing and the repair and installation of machinery and equipment. These sectors are classified under Divisions 31 to 33.[14] These firms accounted for almost 27% of the manufacturing GVA in 2016. Employment data published by Jobsplus show that in 2016 these firms employed 4,827 individuals on a full-time basis, equivalent to 23% of the industry's gainfully occupied population (see Chart 6).

Firms producing food, beverages and tobacco products (C10-C12) generated 18% of the sector's share of GVA in 2016. These firms generated 2,443 full-time jobs and accounted for 17% of its gainfully occupied population. Firms producing chemical and pharmaceutical products (subsectors C19-C21) also played a significant role, as they generated around 12% of manufacturing GVA and offered around 1,452 full time jobs (7% of the sector's full-time jobs).

From a longer term perspective, the share of GVA generated by each sub-sector has changed significantly. In 1995, industries producing furniture, other products and repair and installation of machinery and equipment (C31-C33), generated around 21% of the sector's output. They were followed by firms specialising in electronics, electrical equipment and machinery and equipment (C26-C28), which generated slightly less than one fifth of the sector's output. The former sector saw its share increase strongly over time, rising by 6 percentage points between 1995 and 2016, while the latter decreased its share by 9 percentage points (see Chart 7).

Chart 6
GROSS VALUE ADDED AND GAINFULLY OCCUPIED POPULATION BY SUB-SECTOR IN 2016
(as a share of total in the manufacturing sector)

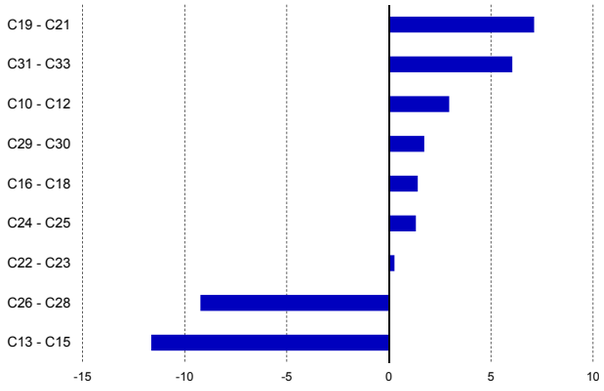


Source: NSO.

[13] Refer to Appendix 1 for an explanation of the classification used in this section.
[14] The other manufacturing sector includes firms specialising in jewellery, bijouterie and related articles, musical instruments, sports goods, games and toys as well as those manufacturing medical and dental instruments and supplies.

The largest increases since 1995 were recorded by firms in the chemicals and pharmaceutical industries (C19-C21). This sector expanded at the fastest rate and grew into the most important segment by 2016. By contrast, sectors focusing on textiles, wearing apparel and leather products (C13-C15) saw a decline of approximately 12 percentage points over the years, and in 2016 generated only 2% of manufacturing output. On balance, this sub-sector along with sub-sectors (26-28) lost importance over time, while activities classified under subsectors (C31-C33), which were already important in 1995 continued to account for a significant share of manufacturing activity.

Chart 7
CHANGES IN THE SHARE OF GROSS VALUE ADDED IN THE MANUFACTURING SECTOR FROM 1995 TO 2016
(percentage points)

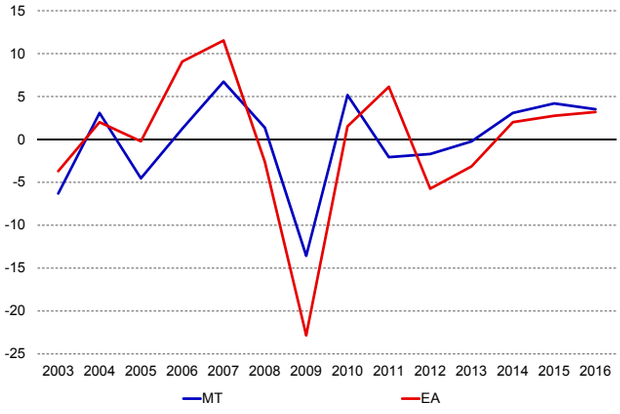


Source: NSO.

Industrial sentiment and factors limiting production

The industrial confidence indicator, published by the European Commission (scaled to have a mean of zero over the period 2003-2016) has experienced a recovery since 2013 (see Chart 8).[15] However, the indicator dropped slightly in the last year and remained below the peak registered before the financial crisis of 2009. In 2016, sentiment in Malta's manufacturing sector was slightly higher compared with that registered in the euro area.

Chart 8
INDUSTRIAL CONFIDENCE INDICATOR
(seasonally adjusted; percentage points; normalised)



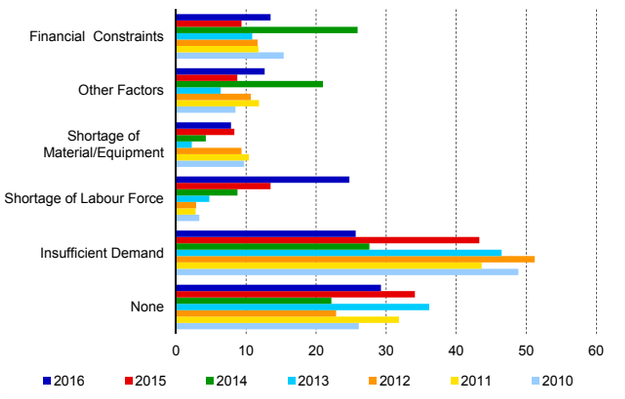
Sources: European Commission; Author's calculations.

The components that make up the overall industrial confidence indicator point towards a less pessimistic sentiment in the industry in the latest years in the Maltese economy. The fact that the industrial sector reported an assessment of improved, but still negative order books,

[15] The industrial confidence indicator is the arithmetic average of the balances (in percentage points) of the answers to the questions on production expectations, order books and stocks of finished products (the last with inverted sign).

higher productive expectations and an improvement in the stock levels have been a key factor behind the amelioration in industry's sentiment in recent years.[16]

Chart 9
FACTORS LIMITING PRODUCTION IN THE MANUFACTURING SECTOR IN MALTA
(per cent of respondents)



Source: European Commission.

The Commission also puts forward questions regarding the factors that might hinder production (see Chart 9). The share of respondents who reported no obstacles in the manufacturing industry was almost 30% in 2016, slightly less than in the previous year and in line with the average observed in recent years.

The biggest limiting factor to the Maltese manufacturing industry seems to be insufficient demand, although the percentage of respondents mentioning this factor in 2016 was one of the lowest on record since the survey started. The manufacturing industry is also reporting an increase in shortage of labour force, which seems to have gained significantly in importance in recent years. In fact, this is also reflected in the increased number of foreigners employed in the manufacturing sector. On the other hand, financial constraints and shortages of material or equipment seem to be less problematic for manufacturing firms based in Malta.

Conclusion

In recent years the manufacturing sector has started to see a positive, though cautious, turnaround from the 2009 recession. The improvement in activity is also reflected in employment, which has started to recover from the steep decline recorded in previous years. Notwithstanding the increased availability of foreign workers, sentiment indicators suggest that the industry is not immune to labour shortages. In addition to labour shortages, insufficient demand is also frequently mentioned as a limiting factor, possibly indicating that competitive pressures may have persisted in some pockets of manufacturing. Cross-country hourly cost indicators suggest that labour cost differences would at best explain a very small part of competitive challenges.

More broadly, the sector remains highly heterogeneous and while some industries have registered substantial growth in their value added, others have seen decreases. Productivity

[16] The index reported above normal stock levels numerous times over the review period. This indicates lower turnover for firms and affects the overall indicator in a negative way.

indicators also diverge significantly across subsectors. An in-depth assessment of key trends in the manufacturing sector should therefore take these differences into account.

The manufacturing sector has benefited from a series of incentives launched by public entities, aimed at reducing financial constraints, supporting innovation and enhancing labour skills. These aim to encourage new start-ups and to assist current firms to expand by investing more. Measures have also been taken to encourage economic diversification, thus increasing job opportunities. The analysis presented in this Box suggests that these initiatives should be maintained as the manufacturing sector remains an important source of activity, with strong links to services. Incentives may also need to be better linked with performance, in order to sustain and enhance the recent recovery in this sector.

Appendix 1

STATISTICAL CLASSIFICATION OF ECONOMIC ACTIVITIES IN THE MANUFACTURING SECTOR

C10	Manufacture of food products
C11	Manufacture of beverages
C12	Manufacture of tobacco products
C13	Manufacture of textiles
C14	Manufacture of wearing apparel
C15	Manufacture of leather and related products
C16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
C17	Manufacture of paper and paper products
C18	Printing and reproduction of recorded media
C19	Manufacture of coke and refined petroleum products
C20	Manufacture of chemicals and chemical products
C21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
C22	Manufacture of rubber and plastic products
C23	Manufacture of other non-metallic mineral products
C24	Manufacture of basic metals
C25	Manufacture of fabricated metal products, except machienry and equipment
C26	Manufacture of computer, electronic and optical products
C27	Manufacture of electrical equipment
C28	Manufacture of machinery and equipment n.e.c.
C29	Manufacture of motor vehicles, trailers and semi-trailers
C30	Manufacture of other transport equipment
C31	Manufacture of furniture
C32	Other manufacturing
C33	Repair and installation of machinery and equipment

Source: Eurostat.