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The global set-up of enterprises impacts the statistics on Danish production and income

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The way in which Danish enterprises choose to organise their production and sales in the global economy impacts whether it is reflected as domestic production and value added (GDP) or only as income (GNI) in the national accounts. When Danish enterprises sell products abroad, the activities are included in Danish GDP, whereas income based on sales via subsidiaries abroad is only included in GNI. In this way, the choice of sales channel impacts the statistics on Danish production and income.

This analysis describes the global set-up of Danish industrial groups and their impact on the Danish economy. Focus is on the close correlation between Danish exports and income from subsidiaries abroad. The analysis is an extension of a Statistics Denmark analysis from 2016 dealing with goods exports outside Denmark by Danish manufacturing enterprises. Income data from the central bank of Denmark, Nationalbanken, has allowed us to further document the importance of the industrial groups to the Danish economy.

Main conclusions:

- The industrial groups are important to the Danish economy; they export goods and services produced in Denmark or abroad and receive income from subsidiaries abroad.
- In 2016, Danish industrial groups' sale abroad of goods not crossing the Danish border accounted for almost a third of their total sale of goods abroad of DKK 524 billion.
- The income from subsidiaries of DKK 42.1 billion accounts for approximately one third of total earnings from Danish industrial groups' manufacturing activities abroad. These earnings could have been counted as exports had the group chosen a different role for the production taking place in subsidiaries abroad.
- In 2016, the industrial groups' activities abroad accounted for approximately 6 per cent of the Danish gross national income (GNI) and approximately 4 per cent of the gross domestic product (GDP).

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Industrial groups' global production and the Danish economy

Globalisation and technological development have allowed enterprises to set up their production in new ways, compared to previously where production and administration predominantly took place in the home country of the enterprise. A Danish enterprise may for example produce goods in low-cost countries or countries providing an easier access to new markets. Correspondingly, accounting and IT centres can be located in countries far from headquarters, and financial transactions can be structured across borders. The global set-up of multinational enterprises results in many intra-group activities that are crossing borders.

A previous analysis[2] from Statistics Denmark described the global production set-up of multinational enterprises. It focused on Danish goods exports taking place outside the Danish borders. This analysis is a continuation, where focus is on the close correlation between exports and income from subsidiaries abroad.

The set-up of multinational enterprises impacts the relationship between GDP and GNI
The economic transactions by Danish enterprises are recorded in the Danish balance of payments. The balance of payments records among other things international trade made by Danish enterprises and the income received from their subsidiaries abroad. The balance of payments is an important part of the national accounts, which among other things records the overall Danish production.

Danish production is defined in the national accounts as production owned by enterprises in Denmark. This implies that production abroad counts as Danish production, if enterprises in Denmark have ownership of the goods. One of the key figures of the national accounts is the gross domestic product (GDP), which measures the total Danish value added, i.e. the value of the overall private and public production minus the value of intermediate consumption. Another important key figure is the gross national income (GNI). GNI measures the total income accrued to Denmark, including income accrued in the Danish enterprises' subsidiaries abroad. GNI corresponds to GDP plus net income from abroad. The way that Danish enterprises choose to organise their production and sales in the global economy, impacts whether it is recorded in these statistics as Danish value added (GDP) or only as Danish income from abroad (GNI).

Accordingly, Danish GDP includes the value added created by enterprises in Denmark, regardless of where their production takes place. If on the other hand the Danish enterprises let their subsidiaries abroad own the goods produced and sold abroad, the value added is not included in the Danish GDP. If the subsidiaries abroad generate a profit, it is counted as part of the net income from abroad and is included in GNI. Consequently, the legal ownership of the goods determines whether the sale of goods is included in both GDP and GNI, or only in GNI. A different set-up where none of the goods produced abroad are sold via subsidiaries, would increase Danish GDP, whereas GNI would remain unaffected. Denmark simply earns a lower income (primary income) from the activity abroad[3]. This means that regardless of how the global production is set up, the value added accruing to Denmark will always be included in (and impact) Danish GNI, but not always included in (and impact) Danish GDP. Figure 1 shows Danish GNI and GDP for the total Danish economy. As it appears from the figure, GDP does not differ much from GNI. In 2016, GDP accounted for 97.5 per cent of GNI[4].

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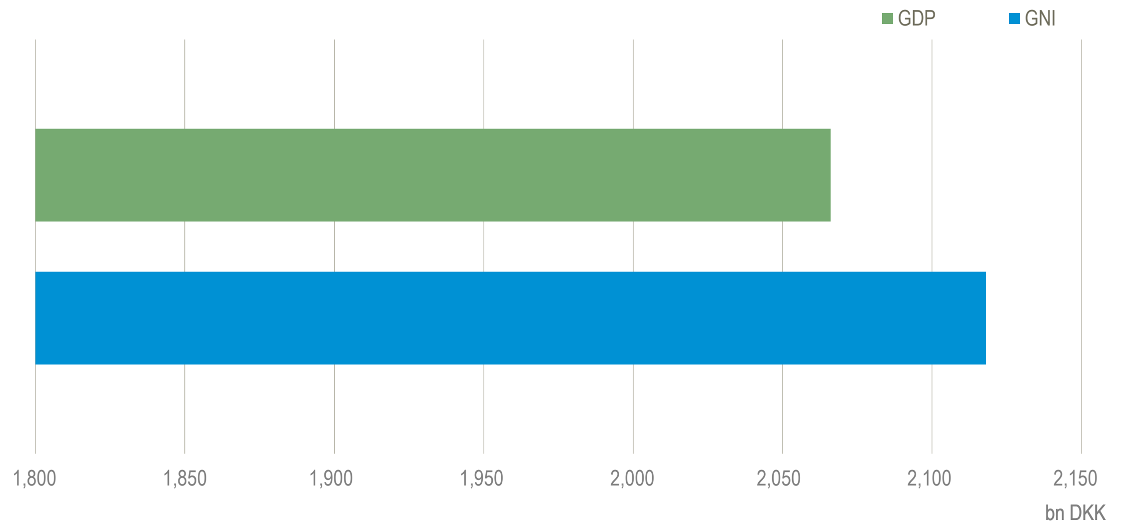
[2]Statistics Denmark analysis: Large increase in sales of goods abroad by Danish manufacturing industries, 2016.

[3] Primary income from subsidiaries abroad consists of distributed dividends, interest on intra-group net lending, and reinvested earnings [i.e. the income from abroad does not necessarily enter Denmark]

[4] Note that GNI may be less than GDP if payments to other countries from foreign-owned companies in Denmark exceed the payments from Danish-owned companies abroad. In addition, transactions other than those carried out by enterprises affect GNI for the general economy.

Figure 1. GDP and GNI for the Danish economy. 2016



Source: www.statistikbanken.dk/nan2

Significant globalisation among industrial groups

Globalisation is particularly significant in the manufacturing industry. In this analysis, we examine enterprise groups, i.e. parent enterprises and all underlying subsidiaries in Denmark and abroad. A large industrial group typically includes enterprises belonging to several industries that interact closely with each other, e.g. manufacturing, sales and holding companies. Thus, the individual enterprise itself may not formally belong to the manufacturing sector, but is still included as an important part of a large industrial group. By focusing on enterprise groups rather than single enterprises, it is possible to examine industrial groups' overall activity[5]. See box 1 for further details.

Box 1. Industrial groups

Enterprises in a group are acting as a joint group and not as individual enterprises, which is why the combined activity within an industrial group is relevant for understanding how a global production set-up is done. This is particularly relevant when comparing the income of industrial groups via subsidiaries with the revenue from direct exports.

Enterprises that have relocated their production to a subsidiary within the group are still considered to be in an industrial group if the control of the production remains within the group. Thus, in this analysis we include all enterprises that belong to an industrial group. The analysis is based on the activities of 3,288 industrial groups in 2016. Note, that groups in this context also include single enterprises without subsidiaries abroad. See appendix 1 for details on the method applied for the definition of industrial groups.

Furthermore, some enterprise groups fall into a special category with regard to global production set-ups. These are enterprise groups that have outsourced *all* their production, including ownership of all raw materials, to a third party outside the group. The role of these enterprise groups is to design, provide intellectual property rights and control the production process. This type of "production" is formally treated as commercial activity and is not considered to be manufacturing activity in the national accounts, nor will it be included in the definition of industrial groups in this analysis.

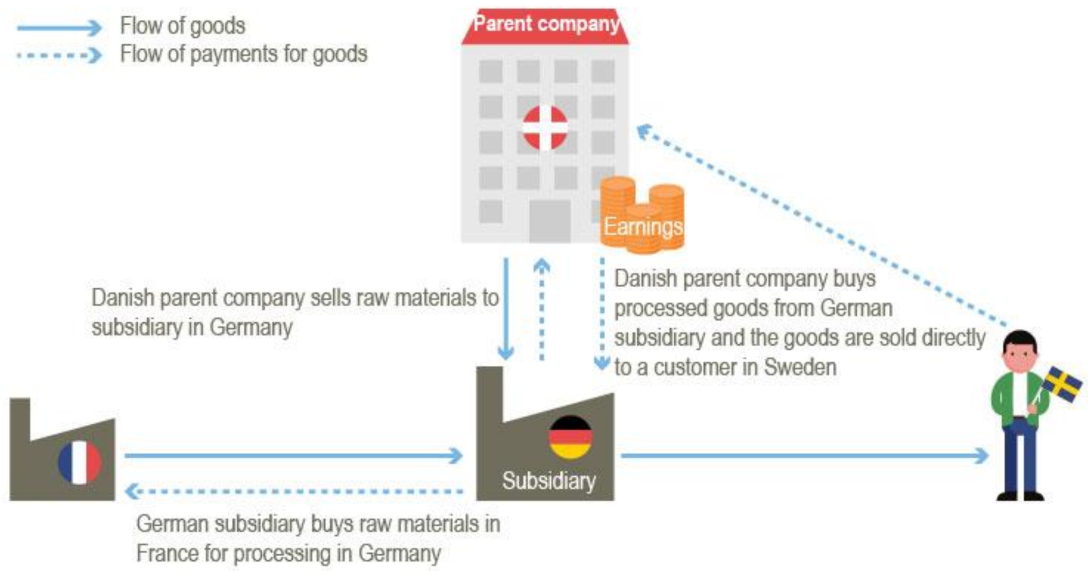
As mentioned, industrial groups can choose to organise production abroad in several ways. Below you will find some examples of typical globalised "business models". In all of the examples, the parent is located in Denmark and the manufacturing is carried out by a subsidiary in Germany – i.e. although the manufacturing is undertaken by a Danish industrial group, it takes

[5] Note that the analysis from 2016 only examined enterprises in the industrial sector. In this analysis all enterprises that are part of an industrial group are examined, regardless of the activity of the individual enterprise. A group approach is chosen especially to be able to include income from subsidiaries abroad in the analysis.

place outside Denmark. Note that the flow of goods in the three examples is identical. The distinction between the three business models is the role of the parent in the production process.

Business model 1 – Merchanting

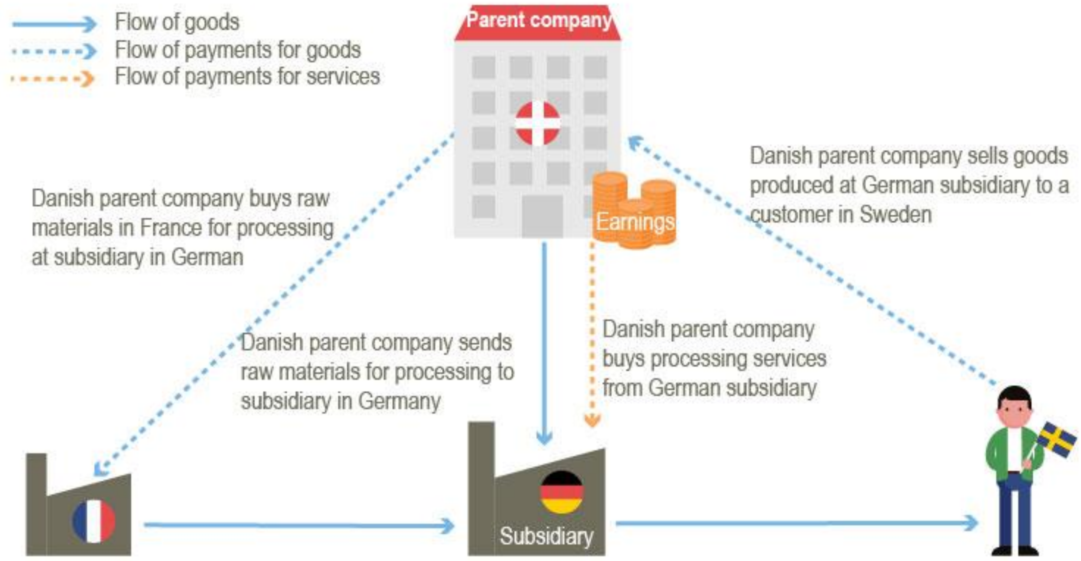
Danish parent acting as a merchant abroad
The Danish parent sells raw materials to its foreign subsidiary. Subsequently, the parent buys the finished goods from its subsidiary and resells them to a final buyer abroad. The finished goods never cross the Danish border. This is a case of a merchanting set-up. In the example below, a subsidiary in Germany buys raw materials from an independent French factory and from its Danish parent. After production, the subsidiary sells the finished goods to the Danish parent, which resells them to a Swedish customer. The goods are shipped directly from Germany to Sweden.



Business model 2 – Processing

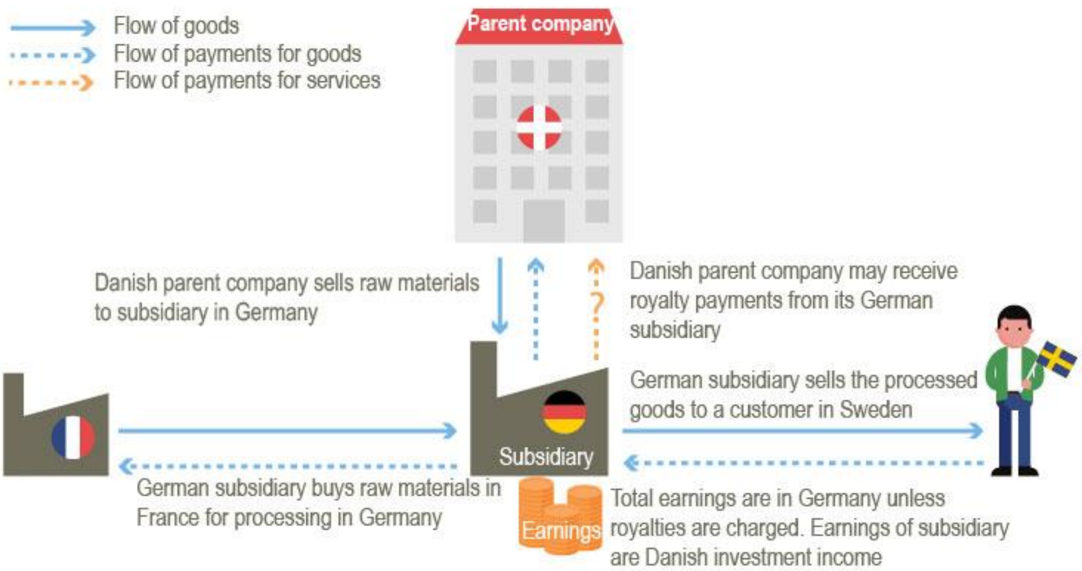
Danish parent owns the goods during the production abroad
The Danish parent leaves the production of goods to a foreign subsidiary, but contrary to business model 1, the parent owns the goods throughout the processing and is also responsible for the subsequent sale. The subsidiary is paid for processing the goods. This is a case of a processing set-up. In the example below, the Danish parent buys the French raw materials that are used by the German subsidiary, and it also ships raw materials from Denmark to Germany. In addition, the parent pays the German subsidiary for processing the raw materials[6]. Subsequently, the Danish parent sells the finished goods to the Swedish customer, and the goods are shipped directly from Germany to Sweden.

[6] The payment for the processing services may also include expenses for raw materials applied by the German subsidiary in the production.



Business model 3 – Investment income

Danish parent leaves production and sales abroad to the subsidiary
The goods are produced by a foreign subsidiary. The foreign subsidiary has full ownership of the production and the subsequent sales of the goods. The parent may choose to charge the subsidiary for the use of intellectual property rights. As opposed to business models 1 and 2, where the parent assumes more direct responsibility by outright buying the finished goods or the raw materials, this model may operate with a minimum of effort from the parent. In the example below, the German subsidiary has taken full ownership of the production and sale of goods. In other words, the German subsidiary is in charge of buying raw materials from France and Denmark as well as the subsequent sale to the Swedish customer. As in the previous examples, the goods are shipped directly from Germany to Sweden. The Danish parent can receive both royalties and investment income from its German subsidiary. The level of investment income will depend on the level of royalties; the higher the royalties, the lower the investment income.



How is the global set-up reflected in the statistics?

With business model 1, the profit margin made by the Danish parent (i.e. sales price deducted by the purchase price) is registered as goods exports in the balance of payments. The parent's sale of raw materials to the foreign subsidiary is included as traditional goods exports crossing the border. Both transactions are included in Danish GDP.

With business model 2, the Danish parent's purchase of raw materials abroad is registered as goods imports in the balance of payments. The production costs abroad are imports of processing services, whereas the sales of finished goods are registered under goods exports as "sales after processing abroad". As before, the value added is included in Danish GDP, since the Danish parent owns the goods during the production abroad.

With business model 3, the parent may export raw materials to its foreign subsidiary, cf. the example, and this is included in Danish GDP. The foreign subsidiary is, however, responsible for the subsequent production and sale of the finished goods. The subsidiary's profit from the sale of goods can affect Danish GDP and GNI in more than one way.

a) The subsidiary can pay royalties to the Danish parent for the use of patents and registered trademarks, assuming that the parent has ownership of the intellectual property rights. The royalty payments are registered under Danish exports of services in the balance of payments and will be included in Danish GDP.
b) The Danish parent will always receive the earnings of its subsidiary. The earnings are registered under Danish primary income in the balance of payments. This only affects the Danish GNI, and not the Danish GDP. In general, when a Danish industrial group chooses to establish subsidiaries abroad, this is registered as a foreign direct investment (FDI) under the financial account in the balance of payments, i.e. an investment in ownership of foreign capital stock. Earnings generated in the subsidiary as well as interest payments on intra-group net lending are registered as investment income for the parent.

The global set-up of industrial groups creates a general increase in external trade in services. Besides the trade in processing services, the global set-up of enterprises results in increased intra-group cross-border transactions of services such as consulting, accounting, IT activities etc. These service activities are also included in the Danish GDP.

Exports and income of Danish industrial groups in 2016

The total foreign revenue of Danish industrial groups[7] in 2016 is shown in table 1, where it is broken down into the main items of the balance of payments, i.e. goods, services and income. In the balance of payments, merchanting is only stated as the profit margin obtained by the enterprise when the finished goods bought from, e.g. a subsidiary, are sold to the final users. For this reason, merchanting only appears on the revenue side (exports) where expenses are registered as negative exports. In the table, the enterprises total sale of goods is calculated as the sum of traditional exports, sale of merchanting goods and sale of goods after processing abroad. The table shows that the traditional goods exports, where goods cross the Danish border, is still the main sales channel for the Danish industrial groups. However, DKK 157 billion – corresponding to 30 per cent of the revenue from the sale of goods in 2016 – comes from the sale of goods that have never crossed the Danish border (i.e. the sale of merchanting goods and the sale of goods after processing abroad).

The table only shows the revenue side of the balance of payments. Thus, the table does not show the net contribution to the balance of payments, which also includes the expenditure side. Accordingly, the figures do not reflect the contributions to GDP and GNI. Furthermore, the table does not take into account any foreign ownership of Danish enterprises. When a Danish indus-

[7] See appendix 1 for details on the method applied for the definition of industrial groups. The analysis is based on the activities of 3,288 industrial groups in 2016.

trial group distributes profits to its shareholders, part of the profits earned abroad will be channelled back to any foreign shareholders.

Table 1. Danish industrial groups' revenue, broken down by main items of the balance of payments. 2016

Principal item in the balance of payments	Activity	Revenue	Included in calculation of
		million DKK	
Goods		**459 671**	**GDP and GNI**
	Sale of goods total (exclusive of netting off for purchase of merchanting goods)[1]	**524 010**	
	Traditional exports of goods[2]	367 111	
	Sales resulting from merchanting activity[3]	96 180	
	Purchase price for merchanting goods	-64 338	
	Sales after processing abroad	60 719	
Services		**35 299**	**GDP and GNI**
	Royalties received	7 128	
	Other sales[4]	28 172	
Income		**42 193**	**GNI**
	Income from subsidiaries abroad	42 193	
Total revenue		**530 270**	

Source: Data extraction made especially for this analysis.

[1] Total sale of goods reflects the value of the goods sold abroad by the industrial groups. Contrary to the goods exports in the balance of payments, the purchase price for merchanting goods is not netted off in this figure.

[2] Traditional exports are defined as goods crossing the Danish border and sold by a Danish enterprise to an enterprise abroad, which could be a subsidiary of a Danish enterprise, e.g. an intra-group trade.

[3] Merchanting is stated as profit margin in the balance of payments. For this reason, merchanting only appears on the revenue side, where expenses are registered as negative exports.

[4] Other sales comprise the sale of services by manufacturing enterprises, including processing services, repair works and set-up of stationary plants.

Comparing the business models of globalisation – 'direct' versus 'indirect' exports

The economic weight and implications of the different business models cannot be directly compared using the revenue figures from table 1. It is necessary to look also at the costs and compare the earnings generated by the different sales channels.

In models 1, 2 and 3a, the earnings include a lot of Danish value added, and in 3b, earnings primarily reflects the result in the foreign subsidiaries[8]. In these four business models, the earnings from sale of goods abroad are brought home to the parent enterprise in Denmark in the following ways:

1 A Danish parent receives earnings from sale of finished goods purchased from a subsidiary abroad

2 A Danish parent receives earnings from sale of goods owned by the parent during the processing by a subsidiary abroad

3a A Danish parent receives royalty payment from a subsidiary abroad for its use of the parent's intellectual rights, and the subsidiary has full ownership of production and sales

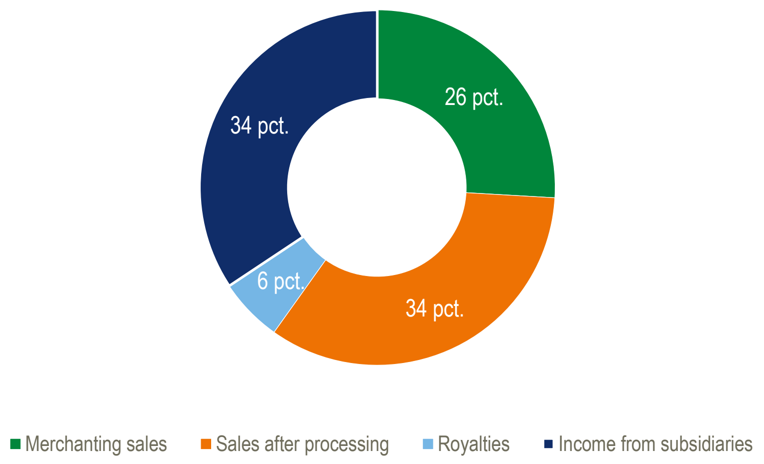
3b A Danish parent receives the result from a subsidiary abroad that has full ownership of production and sales

Figure 2 shows how the earnings from goods production abroad by Danish industrial groups were distributed on the four models in 2016[9]. It shows that the earnings from merchanting and processing activities accounted for 60 per cent. 34 per cent of the earnings from manufacturing abroad came from foreign subsidiaries with ownership of the goods sold.

[8] In addition, all interest payments from intra-group net lending are included in this business model.

[9] The calculation of earnings is described in more detail in appendix 2.

Figure 2. Danish industrial groups' earnings from production abroad. 2016



Source: Data extraction made especially for this analysis.

Note: Income from subsidiaries abroad includes the result in the subsidiaries as well as the net interests received on intra-group loans between parent companies and subsidiaries.

The distribution in figure 2 is described in more detail in table 2. The table shows earnings from merchanting sales, from sales after processing abroad, from royalties as well as from profit received from the industrial groups' foreign subsidiaries. As mentioned earlier, earnings may shift between the different business models if the industrial groups opt for a different set-up. For instance, an industrial group may choose to move the merchanting profit margin (business model 1) to a subsidiary, which is responsible for sales to the end customer (business model 3b). In this way, the earnings will be registered as investment income from the subsidiary instead of earnings from merchanting; however the flow of goods will remain unchanged.

Table 2. Danish industrial groups' earnings from production abroad, broken down by type. 2016

			Included in the calculation of
Business model		million DKK	
1	Merchanting	31 842	GDP and GNI
2	Processing	41 696	GDP and GNI
3a	Royalties	7 128	GDP and GNI
3b	Income from subsidiaries abroad	42 193	GNI
	Total	**122 859**	

To a wide extent, Danish industrial groups leave production and subsequent sales abroad (including ownership of the goods involved) to their subsidiaries abroad. This business model implied that in 2016 one-third of "Danish" earnings from manufacturing abroad were not included in GDP, but were only included in GNI. If the Danish groups opted to change their production set-ups in terms of accounting to merchanting, processing or royalty payments, this would be fully included in GDP (GNI would remain unchanged).

In step with globalisation, Danish industrial groups have increasingly organised their production across borders. The international activities impact the economic indicators, but the statistics are sensitive to how the industrial groups legally organise their activities abroad. Regardless of organisation, the production abroad by Danish industrial groups is extensive. In order to put the groups' activities abroad into perspective with known key indicators, the earnings from these activities may be put in relation to GNI and GDP. However, it should be mentioned that the share of GNI and GDP do not reflect the precise contribution of foreign activities to these indicators. No remuneration for Danish factors in the foreign activities has been taken into account, i.e. persons in Denmark who contribute to the production and sales abroad, e.g. marketing experts and general management. With respect to GNI, the foreign owners or shareholders of

Danish enterprises have not been taken into account. The latter omission tends to exaggerate the contribution to Danish GNI coming from production abroad, while the first mentioned omission of domestic intermediate consumption tends to exaggerate both the GDP and GNI contribution. Subject to these reservations, earnings from the Danish industrial groups' production abroad accounted for 6 per cent of GNI in 2016. Regardless of how the industrial groups choose to set up their production, the share in relation to GNI will remain unchanged. The share of the earnings abroad included in GDP, i.e. merchanting sales, sales after processing, and royalties, amounted to four per cent of Denmark's total GDP in 2016.

Literature

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Appendix 1. Definition of industrial groups

This analysis assesses the activity of manufacturing enterprises in the broader sense to shed light on the activity of enterprises, which are not registered in the manufacturing sector but which nevertheless participate in an industrial group. These “border-line” enterprises include the group headquarters, holding companies, research and development companies, and trading companies[10]. The argument in favour of this approach is that manufacturing enterprises act as a joint group across borders and industrial classifications rather than as individual enterprises. This is especially relevant in this analysis where the industrial groups’ income from their subsidiaries abroad is compared to their direct exports, since it is not necessarily the manufacturing entities that own the other enterprises in the group.

The scope and definition of an industrial group is based on the group statistics, the statistical business register and the statistics of Danish subsidiaries abroad. Information on the number of employees in foreign subsidiaries broken down by industry is retrieved from the statistics of Danish subsidiaries abroad. The information is obtained for Danish enterprises that have subsidiaries in the manufacturing sector[11]. Information on number of employees and turnover in Danish manufacturing enterprises is retrieved from the Statistical Business Register. This information is merged with the statistics on groups to find all the enterprises in a group which are not classified as belonging to the manufacturing sector. Data on the number of employees and turnover for these enterprises is retrieved from the statistical business register. Note, that manufacturing enterprises that are not part of a group (i.e. independent enterprises), will be included as a group with only one enterprise.

In order to ensure that the chosen groups’ main activity is within industry, the concentration of employees and turnover in the manufacturing sector as well as the extent of the group’s production have been considered. The following criteria were applied in order de delimit the population:

An industrial group must have either

- At least half of its domestic employees in the manufacturing sector and
- At least 100 employees

Or generate

- At least half of its total turnover in the manufacturing sector and
- A manufacturing turnover of at least DKK 10 million per year

Or have

- At least 100 employees in the manufacturing sector abroad and
- At least half of its employees abroad in the manufacturing or the commercial sector[12]

Finally, groups that meet the above criteria, but are not considered as belonging to the industry groups, have been removed.

For the year 2016, 3,288 industrial groups have been identified.

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[10] This delimitation varies from the traditional way of assessing the manufacturing industry in the national accounts, in the TEC and STEC statistics as well as in the Business statistics.

[11] The manufacturing sector is defined as sector ‘C’ in NACE Rev. 2, the statistical classification of economic activities in the European Community.

[12] The commercial sector is defined as sector ‘G’ in in NACE Rev. 2.

Appendix 2. Conversion from sales to earnings

To be able to compare the industrial groups' activity outside Denmark, it is necessary to convert the earnings from direct exports from a Danish enterprise to the earnings from the corresponding "indirect exports" via a foreign subsidiary. Direct exports include merchanting sales and sales after processing, where a Danish enterprise has ownership of the goods. Indirect exports include royalty revenue and received earnings from foreign subsidiaries that have ownership of the goods. The calculated earnings are the profits that would be generated in a subsidiary if it undertook the direct exports.

- **Business model 1, merchanting:** The indirect earnings – profit margin – are calculated as the sales price minus the purchase price, since these are the earnings that will accrue to the company responsible for sales to the end customer.
- **Business model 2, processing:** The indirect earnings are calculated as the total production output (goods sold abroad after processing abroad as well as goods returned to Denmark after processing abroad) minus costs for input. Input includes processing services and raw materials, where raw materials include goods that are sent from Denmark for processing abroad.
- **Business model 3:** No conversion.

Conversion from sales to earnings for the industrial groups' activity outside Denmark. 2016

	Million DKK
Business model 1	
Direct sales as a result of merchanting activity	96 180
Purchase price for merchanting goods	-64 338
Calculated earnings	31 842
Business model 2	
Direct sales abroad after processing abroad	60 719
Goods returned to Denmark after processing abroad	1 757
Output in total	62 476
Purchase of goods abroad for processing abroad	11 777
Goods sent from Denmark for processing abroad	2 294
Purchase of processing service	6 709
Input in total	20 780
Calculated earnings	41 696
Business model 3	
Royalties	7 128
Result in subsidiaries	42 193
Total earnings	**122 859**

Note that the above table does not take into account any costs that the industrial groups may have incurred in Denmark when carrying out the production and sales in connection with manufacturing abroad. This could be e.g. marketing, IT, and general management expenses. Therefore, the calculated earnings do not correspond to the direct effect on GDP and GNI.

The valuation of the results in subsidiaries, i.e. the income, is in theory the result after depreciation and before taxes, but in practice the reported value is after taxes (including any reimbursed tax payments). This means that the earnings from subsidiaries is underestimated compared to earnings of the other business models. Depreciations on the other hand, are expected to reduce the earnings of all business models, as they should be included in the processing service fee or in the purchase price for merchanting goods.