



# SERVICE CONTENT IN THE MINING AND MANU- FACTURING INDUSTRY

– how structural change is affecting Sweden

almeqa

## Background

Since the 1990s, the mining and manufacturing industry's products have increasingly been produced with the help of services, for example, technical solutions, design and software. These kinds of services are usually referred to as knowledge-intensive business services, and contribute in the form of subcontractors to the output and development of the mining and manufacturing industry's products which contain services such as technological innovations, IT, research and development (R&D), design, organisation solutions, management, marketing, and staffing services among other things.

The increased need for advanced services for the production of the mining and manufacturing industry's products has been a driver for structural change. We are moving towards increased outsourcing of service production from the mining and manufacturing industry, which means increased purchases of services as an input to the mining and manufacturing industry's production.

The increasingly stronger symbiotic relationship between goods and services in the mining and manufacturing industry's products is changing our view of Swedish production. With completely new figures, Almega<sup>1</sup> can now provide a more accurate picture of the mining and manufacturing industry's overall importance for the Swedish economy, now that even other production that the mining and manufacturing industry uses

<sup>1</sup> See Almega's report in Swedish only *Företagstjänster – allt viktigare för Sveriges produktion och konkurrenskraft* (Business Services – increasingly important for Sweden's production and competitiveness), November 2014.

is included. With the help of statistics from Statistics Sweden, Almega has added together the other production and the other jobs that the mining and manufacturing industry generates in addition to its direct production and employment. In this way, we obtain an accurate measure of the mining and manufacturing industry's share of Sweden's total production and employment.

## Why the service content is rising in the mining and manufacturing industry

For each person who is directly employed in industrial production to meet the demand for the mining and manufacturing industry's products, there are 1.14 people in other sectors who indirectly work to make this production possible. In other words, on average 1.14 additional people working for subcontractors to the mining and manufacturing industry are employed for every 1 person who is directly employed in the mining and manufacturing industry<sup>2</sup>. This is generally referred to as a multiplier effect.<sup>3</sup>

Among the subcontractors to the mining and manufacturing industry, people working in the services sector have become increasingly important. In 1975, every job that was created in the mining and manufacturing industry to meet the demand for the mining and

<sup>2</sup> The figure is based on 2010 I/O statistics from the Swedish national accounts.

<sup>3</sup> The employment multiplier expresses the relationship between a job in one industry and the degree to which jobs are created in other industries thanks to demand for input goods and services for production in that industry.

manufacturing industry's products meant that indirectly 0.34 jobs were added in the services sector.<sup>4</sup> By 2010, that figure had doubled and risen to 0.70.

This effect on employment in the services sector is an average for the entire mining and manufacturing industry. This means that multiplier effects may differ between individual industries and the employment they generate in the services sector.<sup>5</sup>

<sup>4</sup> See *Det nya näringslivet – samspelet mellan industrin och tjänstesektorn* (The new economy – the interplay between the mining and manufacturing industry and the services sector) a report in Swedish only by Daniel Lind and Lena Hagman, Almega and Unionen, December 2008.

<sup>5</sup> See also *Det nya näringslivet – samspelet mellan industrin och tjänstesektorn* (The new economy – the interplay between the mining and manufacturing industry and the services sector) a report in Swedish only by Daniel Lind and Lena Hagman, Almega and Unionen, December 2008.

That the mining and manufacturing industry has created more jobs in the services sector is due to the fact that the mining and manufacturing industry uses a greater share of services as inputs to its production today than in the past. It is usually said that "the service content" of the mining and manufacturing industry's products has risen.

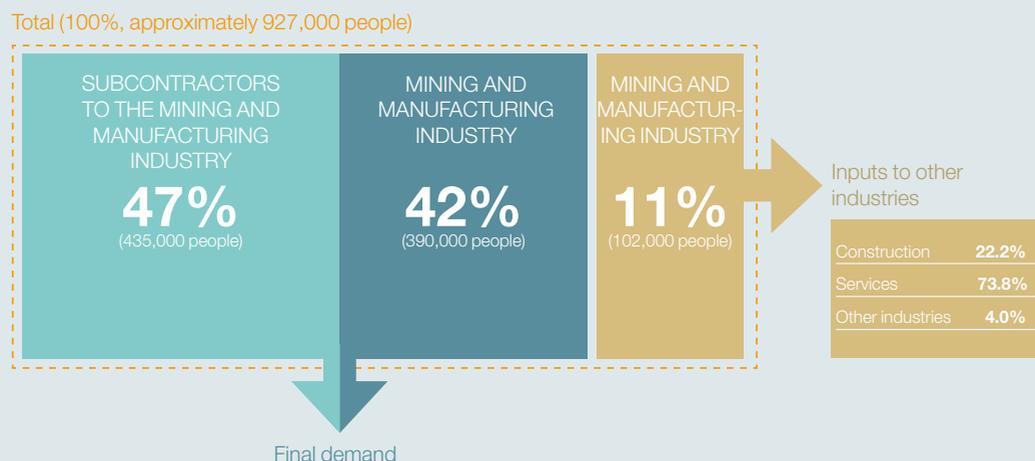
The total number of people employed in Sweden thanks to demand for the mining and manufacturing industry's products in 2010 amounted to close to 930,000 people. This is the sum of those who were employed directly by the mining and manufacturing industry's production for end use (approximately 390,000 people), those who were

Table 1  
How many jobs exist in total thanks to demand for industrial products?

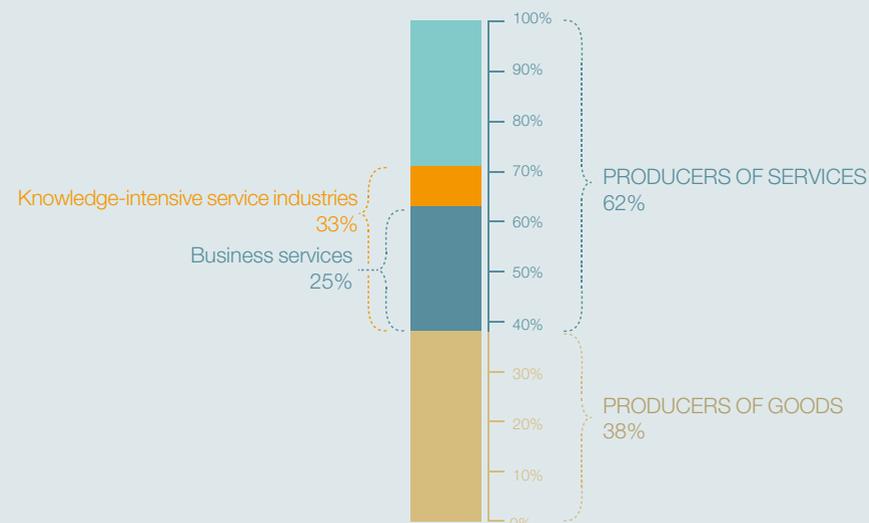
	2010	Share
Total number of people employed for the production of industrial products for end use	824,328	89.0
<i>of which:</i>		
directly employed in the mining and manufacturing industry	389,085	
employed by subcontractors to the mining and manufacturing industry	435,243	
<i>of which subcontractors within:</i>		
Producers of goods	163,655	
Producers of services	271,588	
<i>of which:</i>		
knowledge-intensive industries, of which	143,147	
business services	109,655	
The mining and manufacturing industry as subcontractors to other sectors of the economy	102,291	11.0
<b>Total employed in the production of industrial products</b>	<b>926,619</b>	<b>100.0</b>

Source: Statistics Sweden, Input-Output statistics for 2010

Graph 1  
This is how many jobs exist in total thanks to demand for industrial products



Graph 2  
The shares of different sectors of the mining and manufacturing industry's subcontractors



Source: Statistics Sweden, National Accounts, I/O statistics for 2010.

indirectly employed in other industries in the production of inputs for the mining and manufacturing industry (more than 435,000 people), and those who worked in the mining and manufacturing industry to deliver inputs to industries outside the mining and manufacturing industry (just over 102,000 people).

It is also interesting that there are more people working as subcontractors to the mining and manufacturing industry than those who work directly in the mining and manufacturing industry. Among the subcontractors to the mining and manufacturing industry, more than 270,000 people were employed in the services sector in 2010. Of these,

just over 140,000 worked in knowledge-intensive service industries, and three quarters of these 140,000 worked in business services.

Sixty-two per cent of those who work as subcontractors to the mining and manufacturing industry are employed in the services sector, that is, a larger proportion than the 38 per cent who are employed to produce inputs of goods to the mining and manufacturing industry (see Graph 2).

When we look at the distribution of total employment in the mining and manufacturing industry and related services, it is evident that, among all

the subcontractor industries to the mining and manufacturing industry, it is business services that employed the most people in 2010 – approximately 110,000 people. Thirty per cent of those employed in business services as subcontractors have work thanks to demand from the mining and manufacturing industry for business services as inputs to the mining and manufacturing industry's production.

### How the financial crisis affected the mining and manufacturing industry and its subcontractors

In 2010, those who were employed in Sweden thanks to demand for the

mining and manufacturing industry's products for consumption, investment or export amounted to slightly more than 824,000 people.<sup>6</sup> That is approximately 132,000 fewer compared with 2005. The big fall occurred in connection with the recent financial crisis.

According to Statistics Sweden's input-output data,<sup>7</sup> the mining and manufacturing industry's direct and indirect employment amounted to

<sup>6</sup> Refers to conditions in 2010 according to Statistics Sweden's input-output statistics.

<sup>7</sup> This statistic shows the connections between the outputs of different industries. For a more detailed explanation of how this statistic is constructed, see Almega's report in Swedish only *Företagstjänster – allt viktigare för Sveriges produktion och konkurrenskraft* (Business services – increasingly important for Sweden's production and competitiveness) Almega, November 2014.

approximately 957,000 people in 2005, which was barely 5,000 fewer people compared to 1995. On the other hand, a comparison between 2010 and 2005 shows a drop of slightly more than 132,000 for the mining and manufacturing industry's direct and indirect employment. Based on other statistics, we know that it was mainly during the first years of the crisis, 2008-2009, that employment in the mining and manufacturing industry decreased.<sup>8</sup>

Of the more than 132,000 fewer people employed directly and indirectly in the mining and manufacturing industry in 2010 compared with 2005, subcontractors lost the most jobs – more than 87,000 – and the mining and manufacturing industry consequently lost just over 45,000 jobs. In other words, a marked reduction in the number of people employed in the mining and manufacturing industry overall has occurred in connection with the financial crisis, when we count both direct and indirect employment.

There is much to suggest that the mining and manufacturing industry's restructuring towards an increase in both its service and import content has gone even faster in the context of the financial crisis. In the past few years, up to the first half of 2014, the number of people employed in the mining and manufacturing industry has continued to fall. That is, direct employment in the mining and manufacturing industry which is traditionally measured in the

statistics. This development is not only due to the business cycle but is also associated with the current fragmentation and specialisation of companies' activities towards increased purchases of services from companies in Sweden, as well as imported input goods and services. Besides the structural change, the lengthy recession in connection with the financial crisis has meant a long period of low production and investment levels compared with before the crisis, which, of course, has also had an impact on employment in the mining and manufacturing industry.

The structural change towards the increased production of services, in both the mining and manufacturing industry and in the economy in general, probably means that the jobs growth that can be linked to the mining and manufacturing industry will be even more apparent in the services sector. In order for the mining and manufacturing industry to again generate more jobs in Sweden, both directly in the mining and manufacturing industry and indirectly among subcontractors supplying goods and services, an upswing in demand for the mining and manufacturing industry's products and the mining and manufacturing industry's investments in Sweden is required. Not least investment in intellectual capital, i.e., research and development and service innovations, which has increased as a proportion of the mining and manufacturing industry's investments. This is because the competitiveness of the mining and manufacturing industry today is based more on its

services content in the form of service innovations. In addition, the increased needs of the mining and manufacturing industry and business services for highly qualified staff ought to be satisfied in order for more jobs to be created in Sweden thanks to the mining and manufacturing industry's and other sectors' demand for business services and other knowledge-intensive services.

### How great a share of GDP is the total production of industrial products?

The most common way to measure a specific industry's share of GDP is to calculate how much the value added is for the industry in relation to Sweden's total production (GDP). For example, if we count the mining and manufacturing industry's<sup>9</sup> share of GDP in this way, its share in 2010 amounted to barely 18 per cent. This share subsequently fell to 15.5 % in 2013.<sup>10</sup> Compared with the 1990s, the mining and manufacturing industry's share of GDP has fallen by approximately five percentage points if one measures in this way.

<sup>9</sup> The mining and manufacturing industry here refers to both the mining and manufacturing industries.

<sup>10</sup> According to the national accounts, Statistics Sweden, July 2014.

The sum of value added for all industries gives the total production in a country. But if you want to show the total production that, for example, the mining and manufacturing industry *per se* generates in Sweden, you should also count the indirect production of inputs from other industries' production in Sweden that is used in the mining and manufacturing industry. In addition, you should also count the mining and manufacturing industry's own direct production; that which goes to final demand and also its production of inputs to other industries. Only then do we really obtain the total value added by the mining and manufacturing industry.

If we make this summation based on the input-output statistics for 2010, we can calculate the mining and manufacturing industry's total share of GDP – a little over 24 per cent in 2010. That the mining and manufacturing industry's share of GDP is so much bigger than the picture that is normally reported reflects in particular the growing production of services linked to the mining and manufacturing industry. Not least, the increased service content in the mining and manufacturing industry's products, which has increased the value added of the mining and manufacturing industry.

You can read more about this in the report "**Business Services – increasingly important for Sweden's production and competitiveness**" from Almega. This report is available in Swedish only at [almega.se](http://almega.se)

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<sup>8</sup> See, for example, the national accounts, Statistics Sweden.



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