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Contact: Maria Kayamanidou and Ignacio Puente González

E-mail: Maria.Kayamanidou@ec.europa.eu and Ignacio.PUENTE-GONZALEZ@ec.europa.eu

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Denmark Country Report
EUFORI Study

Steen Thomson
Thomas Poulsen
Christa Børsting

Center for Corporate Governance, Copenhagen Business School
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1 Contextual Background

1.1 The historical background
Charitable foundations have a long history in Denmark dating back to Catholic social institutions before the reformation. Foundations would be endowed with property (e.g. an estate) or financial assets and would serve their purpose through donations or operations such as a hospital or providing for the poor. After the Industrial Revolution, some foundations were also endowed with shares in a joint stock company, the brewery Carlsberg being a prominent example. These so-called industrial foundations became an important part of the Danish business landscape, partly as a shelter from high private wealth taxes during the 1970s and 1980s. Retaining ownership of the company became an important secondary or even primary objective for many industrial foundations. Converted mutuals provided an alternative source of new foundations for owners of banks or other financial institutions.

Historically, foundations were subject to voluntary supervision by the King, the Church or the relevant government ministries, but over time two foundation authorities have emerged; one for industrial foundations under the Ministry of Business and one for other foundations under the Ministry of Law. In the 1980s a series of new laws targeted the regulation and taxation of both industrial and non-industrial foundations; for example, a foundation register was established and industrial foundations became taxable on a par with private companies. The legal framework was updated in 2014 with an increased emphasis on the supervision, transparency and governance of foundations.

1.2 The foundation landscape
Danish foundations play a central role in Danish research and development. More than half of their donations go to research and their research donations account for some 15 % of total government research and development (R&D) expenditure, and 5 % of the total Danish R&D. They are particularly prominent sponsors of research in medicine and biotechnology. Additional donations to education and public buildings also indirectly benefit research institutions.

In Denmark, foundations play a unique role as owners of large and research intensive companies that account for about half of the total Danish R&D expenditure (Thomsen, 2012a). In most cases, these companies have independent research co-operation with Danish research institutions. In some cases they support innovation, not by grants or operations, but rather by ownership, i.e. through foundation support startups. This is in effect support for innovation, but is not counted as such in this study.

There are some 1300 industrial foundations and 10 000 non-industrial foundations in Denmark. Industrial

foundations are those that own business companies or are involved in direct commercial activity. They
are subject to their own legal regime with a law on industrial foundations and a law on the taxation of
foundations (more on this in section 1.3). [2] They have to submit annual reports to the Danish Business
Authority, which are publicly available, meaning that we have relatively good information about this group
of Danish foundations.

Non-industrial foundations are regulated by the Department of Civil Affairs under the Ministry of Justice.
We know relatively little about the activities of non-industrial foundations since they are subject to a dif-
ferent legal regime and are not obliged to register or disclose their accounts. [3] However, some of the
largest non-industrial foundations voluntarily disclose information on their donations.

Non-industrial foundations may have a general charitable purpose, but they may also have a more nar-
row purpose such as benefitting a founder’s descendants. Similarly, industrial foundations may also have
a charitable purpose – most of them appear to have one, or they may aim solely at business activity, or
and charity: they own the majority shares in major private companies and use this dividend income for
charitable activities and donations to research in particular.

It is important to stress that the term ‘industrial foundation’ is a functional definition as to whether or not
a foundation owns a private company (or conducts other kinds of business). Many, but not all industrial
foundations are philanthropic in the sense that they aim to benefit a general charitable purpose. Likewise,
non-industrial foundations, which are not involved in business activities, may or may not be philanthrop-
ic in the sense of having a general charitable purpose.

Besides private industrial and non-industrial foundations, many foundations are established by govern-
ment institutions. One government-sponsored foundation, Danmarks Grundforskningsfond, aims to ‘pro-
mote and stimulate basic research at the highest international level at the frontiers of all scientific fields.’
This foundation typically sponsors relatively large and long-lasting projects such as research centres.

Some associations with charitable purposes also support research and development. The largest ones are
converted financial mutuals that administer the accumulated reserves of former mutual companies that
are now converted to joint stock companies.

Historically, Danish foundations have been conservatively governed and have donated cautiously com-
pared to the size of their endowments and accumulated reserves. We estimate that donations currently
average 1 % of their book assets. However, in recent years, donations have been rising. This is largely a
reflection of the success of the private companies they own. Foundations are required to fulfill their pur-

2  Lov om Erhvervsdrivende Fonde https://www.retsinformation.dk/Forms/r0710.aspx?id=131732
3  Lov om visse Fonde og Foreninger https://www.retsinformation.dk/Forms/r0710.aspx?id=138731
4  Thomsen, S. (2012b). What do we know about industrial foundations? Working Paper, Centre for Corporate Governance,
    Copenhagen Business School.
pose, as stated in the charter, so the regulator will occasionally ask them to donate more. Many industrial foundations do, however, also have obligations to the growth and welfare of their private companies, which is something that has to be taken into account.

Government policy has cut back on public funding for a range of activities, which in some cases has made public institutions more dependent on private donations, but research spending has often been exempt from such cuts. The situation is thus less dire for universities. Nevertheless, universities are expected to attract more external funding in the future and to look to foundations as possible sponsors.

1.3 The legal and fiscal framework

Act 970 from 1982 is the basis on which the legal framework for Danish foundations is built. The report describes, among other things, the reason for introducing two sets of laws: one for non-commercial foundations and one for commercial/industrial foundations. In short, the reason for this is that certain special considerations need to be taken into account regarding the specific features of commercial foundations (coming from their business activity). These are, for example, the better protection of creditors and other contractual partners, including employees (who have a right to board representation). Another reason is neutrality between the different laws governing business activity.

The first laws for foundations came into force in 1985. There was one each for non-commercial and commercial foundations, respectively. The first law on the taxation of foundations came into force soon after, in 1987 (applicable to both types). There was a general debureaucratisation in 1991. After that, the legal framework did not change notably until the so-called modernisation, which comes into force next year (enacted this year). The purpose of this is primarily to increase transparency, to strengthen the board of directors and also to strengthen the business authority (responsible for supervision).

The fiscal framework derives from the law on the taxation of foundations as mentioned above. Foundations are taxed in a similar way to limited liability firms (ApS) and joint stock companies (A/S). Due to their special purpose there are, however, some exceptions: the first DKK 25 000 is not taxed; foundations are allowed to deduct 125 % of their charitable expenses (the reason for this being to encourage donations to charities and to consolidate the foundations); they are allowed to deduct 100 % of donations to stated purposes that are not charitable (with the condition that the recipient is taxable); foundations are also allowed to deduct 100 % of any provisions for charities; finally, foundations cannot deduct more than their taxable income.

1.4 Research and innovation funding in Denmark

Denmark has an ambitious research policy with R&D expenditure of more than 3 % of the GDP, of which 1 % is government and 2 % is private (slightly less than the 2 % promised in the Barcelona accord). Moreover, the government aims to stimulate private research even more and to rank among the top five OECD countries in 2020. Among the key priorities are that Danish universities should become more attractive business partners, that collaboration between research and industry should be enhanced in order to make faster use of research results, and to make them more accessible, for example to small and medium-sized
companies and government institutions.

Private foundations play an important role in this regard, both because they own large research-intensive business companies, and because they donate substantial sums to university research. The current government has emphasised a desire to increase cooperation between private foundations and government institutions, and some attempts have been made to make university administrations more flexible in this regard, but so far there have been few tangible policy initiatives.
2 Data Collection

2.1 The identification of foundations supporting R&I

As mentioned, one of the defining characteristics of Denmark is its industrial foundations. These foundations are registered and monitored by the Business Authorities or the Department of Civil Affairs. The register contains no information about the purpose of these foundations – whether a foundation funds and/or operates research and/or innovation. This information was collected manually from previous publications, from direct correspondence with foundations, and from annual reports and websites.

From Thomsen (2012), [5] we know that the largest industrial foundations account for almost all the activity in this category – as well as in terms of donations. Among the industrial foundations, we are focussing on those with more than EUR 100 million in equity capital. This filter reduces the number of foundations to 34. These account for approximately 90 % of the total equity capital held by industrial foundations. Furthermore, we have identified 14 large and important non-industrial foundations. These foundations have not been registered on any central register since 1991, which means that identification is difficult and information is scarce. There are, however, a few sources that we have used besides our networks and local knowledge – Fondsdatabasen and Greens Erhvervsinformation. These sources were checked for their appropriateness and contacted as an attempt to increase their willingness to participate, 12 foundations being deleted from the list during this process, resulting in a final list of 36 foundations. Of these, 26 are industrial foundations and 10 are non-industrial foundations.

The representativeness of our sample is open to question. Based on our own data collection, we know that the industrial foundations in our sample represent 98 % of all the grants provided by the 120 largest industrial foundations for research. It is not possible to make such a precise account of the non-industrial foundations. It is, however, our belief that we have covered the most important players.

There is a caveat about our identification process relating to foundations that support innovation. We know of several foundations in our data that support innovation, not by grants or operations, but rather by ownership, i.e. foundation support startups. This is in effect support for innovation but does not count as such in our study. We also know of several other examples where an industrial foundation indirectly supports innovation via an operating company. This is also not counted as support for innovation. We elaborate on this latter example in more detail in section 5.1.

2.2 The survey

36 foundations received a survey invitation by e-mail. The survey was endorsed by the Danish Business Authority. 20 foundations responded to either the full questionnaire or to a short questionnaire that was

offered later on as an attempt to boost the participation rate. 15 foundations answered the long version. Ten foundations of these are purely research-oriented and five are oriented towards both research and innovation. Five foundations answered the short version. Two of these do not fund and/or operate either research and/or innovation and have thus been left out of the sample. Of the remaining three foundations, one is purely research-oriented and two are oriented towards both research and innovation. In total, there are 18 foundations in our data set, of which seven are non-industrial and 11 are industrial foundations. There is one very important foundation, as well as a few important ones, missing from our data set. This is not because they were not invited, but because they did not answer the questionnaire. Without them the data is inconclusive, so we collected data manually on their donations from their annual reports. These foundations do not distinguish between research and innovation, but, by and large, their donations to research also include donations to innovation – if any. These data were not added to the questionnaire data directly, but managed separately. In chapter 3, we present the results for donations separately and aggregately.

2.3 The interviews
Looking ahead, the questionnaire data show that the foundations are grantmaking foundations for areas of research and which were founded by individuals or families and run by professional, paid staff. It is therefore from this domain that our interviewees were selected. We focussed on foundations that answered the questionnaire, i.e. for which we also have quantitative data. We interviewed five foundations and one stakeholder. Since a considerable number of the foundations in our data, and in the Danish context in general are industrial foundations, three out of the five foundations have this particular characteristic. We conducted the interviews using a semi-structured format. We prepared some country specific questions based partly on the questionnaire data, and we used a list of topics provided by the EUROFI secretariat, but the methodology allowed the interview to take unforeseen directions depending on what the interviewees said.

We report on the interviews in chapter 4, where we try to synthesise and categorise the qualitative data. This section was subsequently sent to each interviewee for their approval.

Foundation 1. Interviewee: Director of Research. Brief motivation: very active in research. This is an industrial foundation.
Foundation 2. Interviewee: Chief Financial Officer. Brief motivation: a more typical example which supports research on a smaller scale, and only applied research.
Foundation 3. Interviewee: Chief Executive Officer. Brief motivation: funds and operates both research and innovation activities on a large scale.
Foundation 4. Interviewee: Chief Executive Officer. Brief motivation: a large State-funded foundation operating independently from the State.
Foundation 5. Interviewee: Chief Executive Officer. Brief motivation: one of the largest and most professional donors to research.
Stakeholder. Interviewee: Regulator, Government official. The foundation’s regulations may influence their support for research and innovation.
3 Results

We start this chapter with a few notes on the questionnaire data per se. We do not see any decline in the response rate as the questionnaire progresses, which is good because it means that the answers are not skewed towards the first part of the questionnaire, as it is often the case. The only significant drops we observe are around questions about the thematic fields of support, where it is unsurprising that there are many of the so-called system missing values. Second, it is important to note that the data is not balanced. Some foundations leave some questions unanswered but in no systematic way. Moreover, the foundations that answered the short version of the questionnaire only enter the data set on a few occasions. This means that answers are not directly comparable across questions. Finally, all foundations report 2012 numbers.

3.1 Types of foundations

The majority of the foundations in the Danish data support research and not innovation. This is the case for 11 of the 18 foundations. The remaining foundations support research and innovation. There was only one foundation that answered the question about whether the foundations support research and innovation, and thus the actual number of foundations in the rest of the questionnaire is 17. Of these, 14 are grantmaking, one is operating, and two are both. The operating foundations all support both research and innovation.

14 foundations answered the question on the year of establishment. 11 of these 14 foundations are more than 30 years old. The youngest foundation was established in the year 2000. The financial founders of these foundations are in most cases a private individual, a family or a for-profit company. This is a typical characteristic of the older foundations. The financial founders of the younger foundations are the public sector (two foundations) and the category of other non-profit organisations (one foundation).

Annual strategy is defined entirely by the governing board (the same 14 foundations as above). Eight foundations have a governing board with appointed members, and seven have a governing board with elected members (one foundation has both). A mean (median) board has eight (nine) members. All the foundations except one have professional paid staff. The foundation with no professional paid staff is in any money the smallest foundation to complete the questionnaire. The mean (median) number of staff members is 14 (nine).

Most of the foundations supporting research also support applied research (12 foundations out of the 13 answering the question about which areas of research the foundations engage in), and many also support basic research (nine) or both (eight). The bigger foundations tend to support basic research with relatively large sums of money, whereas the smaller foundations tend to support applied research with relatively small sums of money. Only one foundation makes relatively large donations to both areas.
3.2 Origins of funds

14 foundations reported their total income. The mean (median) income in 2012 was EUR 556 (34) million, and the total income of these foundations was EUR 8 billion. 90% of this came from two foundations, indicating the difference between the foundations. The foundation with the smallest income had EUR 3 million, and the foundation with the largest income had almost EUR 4 billion. Four foundations had more than EUR 100 million in terms of income and two foundations had less than EUR 10 million. The total income according to category is shown in Figure 1.

Figure 1: Total income according to category
As a percentage of total number of foundations (N=14)

Table 1a: Total income according to category

<table>
<thead>
<tr>
<th>Number of foundations</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean in Euros</td>
<td>556 317 166</td>
</tr>
<tr>
<td>Median in Euros</td>
<td>34 323 056</td>
</tr>
<tr>
<td>Total income in Euros</td>
<td>7 788 440 327</td>
</tr>
</tbody>
</table>

Their income primarily comes from endowments. This is the case for 15 of the 16 foundations answering the question about their sources of income. Five foundations get their income from two sources (always from endowments and then, additionally, either from the government or ‘other’). One of the two very large foundations gets its income entirely from endowments, and the origin of these endowments is in the form of shareholdings from the initial founder. Looking into the background of the other very large foundation, we see that, for the purpose of fitting it into the structure of this study, it can be regarded as a foundation that receives its income from an endowment, where the origin of this endowment is also in the form of shareholdings from the initial founder.

The role of the government is different for foundations that also get their income from this source. For one of the above foundations, income from the government accounts for 1% of its total income, whereas it accounts for 76% for the other foundation. Both of these foundations, are the only ones having government representatives on their boards – two and one, respectively.
It is also worth mentioning that donations are never a source of income. This is not, however, the case if we look beyond our data set, although these donation-dependent entities are set up as associations and not as foundations.

Table 1b. Total income according to category including important missing foundations

<table>
<thead>
<tr>
<th>Number of foundations</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean in Euros</td>
<td>443 727 427</td>
</tr>
<tr>
<td>Median in Euros</td>
<td>31 898 123</td>
</tr>
<tr>
<td>Total income in Euros</td>
<td>7 987 093 678</td>
</tr>
</tbody>
</table>


The origin of an endowment is typically in the form of shareholdings from the initial founder. Donations of money from the initial founder also happen. In fact, these are the only two sources together with the ‘other’ category that appear in our data. The majority of the 12 foundations specifying their source of income expect to either maintain or expand their endowments. But there is some ambiguity in the data. Some foundations answered ‘maintain’ and ‘either up or down.’ Four foundations expect to spend down and two foundations expect to both maintain and spend down, meaning six out of 12 foundations might spend down.

In terms of the size of the foundations, measured by their total assets, there is a positive correlation between income and assets. The largest foundation in terms of income is also the largest foundation in terms of assets. The second largest in terms of income is the third largest in terms of assets, and the third largest in terms of income is the second largest in terms of assets. Five foundations have more than EUR 1 billion EUR in assets, two have less than 100 EUR million, and seven are in between. The mean (median) value is EUR 1.4 billion (EUR 528 million), and the total assets for all 12 foundations is EUR 19 billion. Total assets according to category is shown in Figure 2.

Figure 2: Total assets according to category
As a percentage of total number of foundations (N=14)
For the 13 foundations that reported both total income and total assets, the ratio of the mean (median) total income to the mean (median) total assets is 0.40 (0.06). Approximately 70% of the assets are made up of long-term investments in securities. About 20% are current assets.

### Table 2a: Total assets according to category

<table>
<thead>
<tr>
<th>Number of foundations</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean in Euros</td>
<td>1 377 927 721</td>
</tr>
<tr>
<td>Median in Euros</td>
<td>527 546 917</td>
</tr>
<tr>
<td>Total assets in Euros</td>
<td>19 290 988 097</td>
</tr>
</tbody>
</table>

For the 13 foundations that reported both total income and total assets, the ratio of the mean (median) total income to the mean (median) total assets is 0.40 (0.06). Approximately 70% of the assets are made up of long-term investments in securities. About 20% are current assets.

### Table 2b: Total assets by categories including important missing foundations

<table>
<thead>
<tr>
<th>Number of foundations</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean in Euros</td>
<td>1 422 209 385</td>
</tr>
<tr>
<td>Median in Euros</td>
<td>627 345 845</td>
</tr>
<tr>
<td>Total assets in Euros</td>
<td>25 599 768 929</td>
</tr>
</tbody>
</table>


### 3.3 Expenditure

15 foundations reported the amount of their total expenditure. The mean (median) is EUR 40 (27) million, and the total expenditure for all 15 foundations is EUR 600 million. Two foundations have an expenditure of more than EUR 100 million – one of which is large in terms of both income and assets, but the other is small in terms of assets but relatively large in terms of income. We note that, in contrast to the monetary amounts reported in the previous sections, expenditure is less skewed towards the larger foundations. Total expenditure according to categories is shown in Figure 3.

**Figure 3: Total expenditure according to category**
As a percentage of total number of foundations (N=15)
For the 13 foundations that reported their total expenditure, total income and total assets, the ratio of mean (median) total expenditure to mean (median) total assets is 0.03 (0.05), and the ratio of expenditure to income is 0.07 (0.82). If we look at the median foundation in terms of total income, its ratio of total expenditure to total income is also exactly 0.82. One reason for the large difference between the mean and median values is that large foundations have smaller administrative expenses relative to assets or income. There may, of course, also be other potential explanations for this. For example, when asked about what is expected to happen in terms of their endowments, the largest foundation answered that they are expected to increase, which could indicate a greater retention of earnings. Another potential explanation could be a lack of relevant and appropriate projects to support.

### Table 3a: Total expenditure according to category

<table>
<thead>
<tr>
<th>Number of foundations</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean in Euros</td>
<td>40 256 962</td>
</tr>
<tr>
<td>Median in Euros</td>
<td>26 631 903</td>
</tr>
<tr>
<td>Total expenditure in Euros</td>
<td>603 854 424</td>
</tr>
</tbody>
</table>

On average, research accounts for 45 % of total expenditure, and innovation accounts for 8 %. The distribution of total expenditure according to category is shown in Figure 4. The mean (median) amount given to research is EUR 19 (3) million – again a skewed distribution, and the total amount for all 12 foundations is EUR 280 million (three foundation said that they support research but did not report the amount). The corresponding numbers for innovation are EUR 2 (0) million and EUR 30 million. The biggest contribution to research (innovation) from a single foundation is EUR 80 (19) million.

### Table 3b. Total expenditure according to category including important missing foundations

<table>
<thead>
<tr>
<th>Number of foundations</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean in Euros</td>
<td>40 326 309</td>
</tr>
<tr>
<td>Median in Euros</td>
<td>25 968 901</td>
</tr>
<tr>
<td>Total expenditure in Euros</td>
<td>766 199 866</td>
</tr>
</tbody>
</table>

However, as we have mentioned a few times already, some important donors are missing from the questionnaire data, and, for the sake of completeness on this crucial aspect of the study, we have collected data on expenditure on research for four additional foundations. These foundations would add about EUR 130 million to the total amount given to research in 2012.

Table 4a: Distribution of total expenditure

<table>
<thead>
<tr>
<th>Expenditure on</th>
<th>Euros</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>278 794 134</td>
</tr>
<tr>
<td>Innovation</td>
<td>30 142 091</td>
</tr>
<tr>
<td>Other purposes</td>
<td>268 286 295</td>
</tr>
<tr>
<td>Unknown</td>
<td>26 631 903</td>
</tr>
<tr>
<td>Total expenditure</td>
<td>603 854 424</td>
</tr>
</tbody>
</table>

However, as we have mentioned a few times already, some important donors are missing from the questionnaire data, and, for the sake of completeness on this crucial aspect of the study, we have collected data on expenditure on research for four additional foundations. These foundations would add about EUR 130 million to the total amount given to research in 2012.

Table 4b: Distribution of total expenditure including important missing foundations

<table>
<thead>
<tr>
<th>Expenditure on</th>
<th>Euros</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>411 645 743</td>
</tr>
<tr>
<td>Innovation</td>
<td>30 142 091</td>
</tr>
<tr>
<td>Other purposes</td>
<td>297 780 129</td>
</tr>
<tr>
<td>Unknown</td>
<td>26 631 903</td>
</tr>
<tr>
<td>Total expenditure</td>
<td>766 199 866</td>
</tr>
</tbody>
</table>


About EUR 410 million in total was given to research and innovation in 2012 by Danish foundations. By comparison, public spending on research and development in the same year was EUR 2.7 billion. The share of each foundation’s contribution to total research and innovation is shown in Figure 5, clearly illustrating the differences between foundations.
It is important to remember that this is a down stroke in one year (year 2012). To add to these data, we have thus checked the annual reports for the largest 120 industrial foundations for the time period 2006-2012 for research donations. There are some overlaps with our questionnaire data, but the two are not comparable. Having said that, there is no reason for us to expect that the year-to-year pattern is any different. Figure 6 shows the donations to research as well as their share of total donations.
The relatively large fluctuations reflect both the impact of individual foundations and the business cycle. During the financial crisis many foundations saw their income from operating companies and financial markets drop, but many have subsequently recovered. The peaks in the years 2007 and 2010 were extraordinarily large donations to infrastructure and equipment to a public university from one foundation. It is also evident from Figure 6 that research and development accounts for a relatively large share of the total donations from industrial foundations. It accounted for half of all donations in 2010 and one third in 2012.

As Figure 7 shows, there has also been an increase in donations from non-industrial foundations – the drop from 2006 to 2007 was due to an extraordinarily large donation from one foundation in 2006. The numbers are based on information from 13 of the largest non-industrial foundations. Unfortunately, we were unable to obtain more detailed data on expenditure on research and development, but we know that many of them donate considerable amounts for this purpose. For five of the non-industrial foundations in our questionnaire data, we have information about both total expenditure and expenditure on research and innovation. For these foundations, the share of donations to research and innovation to the total number of donations is almost 50 percent.
We can see that donations from these foundations grew from EUR 130 million in 2007 to EUR 330 million in 2012.

As stated above, we estimate that about EUR 435 million in total was given to research and innovation in 2012 by Danish foundations. This corresponds to more than 15% of the total government R&D expenditure and 5% of the total Danish R&D. The R&D donations by the Danish foundation-owned companies are estimated to account for some EUR 3.4 billion, corresponding to roughly half of the total Danish R&D effort.

In addition, and as mentioned in section 2.1, many Danish foundations are active in innovative activities outside the formal R&D/R&I setting. A number of them engage in new ventures, sponsoring startups and providing seed capital for early-stage ideas. In some cases, these are standard commercial venture activities, but in others they are motivated by the broader social purpose of stimulating innovation and new business activity.

Coming back to the questionnaire data, six of the 13 foundations answering questions about the past and future development of R&I expenditure said that expenditure on research and innovation was about the same as the previous year, four said that it had decreased, and three said that it had increased. Looking to the following year (2013), nine of these foundations expected their expenditure on these areas to remain about the same, while four expected it to increase.
It is not the larger foundations in terms of support for research and innovation that have cut back. In this respect, the larger foundations have increased their support, but they do not expect this to carry forward. In other words, the foundations that increased their expenditure on research and innovation the previous year expected the following year’s expenditures to remain about the same. The foundations that expected the following year’s expenditure to increase are all foundations that either maintained or decreased their expenditure in 2012 compared to the previous year. Only one of these foundations is large in terms of support for research and innovation.

The nine foundations that answered the questions about the allocation of expenditure, allocate 55 %, on average, of their total expenditure to research, and 55 % of this is allocated to direct research. 12 foundations answered the follow-up question on the types of expenditure on research. Ten of these support research only through research grants. The remaining two foundations support research primarily through grants, but also through their own operations. One of these foundations did not, however, categorise itself as an operation foundation in question 2. Only two foundations reported the EUR amount of their support for innovation, but in both instances only grants were used.

3.4 Focus of support

Public universities are the main beneficiaries. Nine foundations reported the shares that the different types of beneficiaries receive, and all of them put public universities as one of their beneficiaries. This particular group receives 75 %, on average, of these nine foundations’ expenditure on research and innovation. The business sector and research institutes are the second and third largest groups, with 11 and nine %, respectively.

Given the support for public universities, and considering the spectrum of research conducted at these universities, it is not surprising that, between the nine foundations, all the research fields are supported. 14 foundations answered the question on the thematic research fields supported. All the foundations support more than one field – four fields on average. Natural science, engineering and technology, medical science, social and behavioural science, and the humanities are the most frequently supported fields. Agricultural science receives comparably little attention (from five of the 14 foundations).

Research mobility and career development, infrastructure and equipment, the dissemination of research, and science communication and education are the major research-related activities. All the foundations support more than one field – again four fields on average. There is no size-related pattern in the support for research-related activities. To attract top international scholars, several foundations support new professorships, often in combination with a bigger and more strategic focus on a specific field. The peaks in the years 2007 and 2010 in Figure 2 are examples of large donations to infrastructure and equipment to a public university. Generally, there is a high positive correlation between support in past years and support in the year in question (2012).

Most foundations see their role as either initiating or complementing their research and innovation processes. This result seems to emphasise that foundations try to some extent to improve their insight into
any societal challenges within their areas of expertise. There is also no size-related pattern in the answers to the question about the role of foundations in the domain of research and innovation, i.e. a foundation’s perception of its own role is independent of the size of its income, assets and expenditure.

### 3.5 Geographical dimensions of activities

Danish foundations are oriented towards the national level. Not all foundations reporting their expenditure on research and innovation also reported their geographic distribution, but for the 11 foundations that did, 94 of every EUR 100 is goes to the national level. This is largely due to the fact that public universities are the main beneficiaries. Of the remaining EUR 6, the EU level receives EUR 2, the local or regional level EUR 3, and the international level EUR 1. One of the foundations supporting the local level has a very influential role in the continuous development of the public university in this region of the country.

Only three foundations answered the question about difficulties with funding or operating in other EU countries. None of these have encountered any problems. 13 foundations answered the next question about the role of the EU. Six foundations see the EU as having multiple roles, but collaboration is always one them. Five of the remaining foundations have no opinion on the role of the EU. The last two foundations see the role as either providing a legal framework or fiscal facilities.

12 of these 13 foundations said that they contribute to European integration through education or research activities. 6 contribute through more than one activity.

### 3.6 Foundations’ operations and practices

The participating foundations are more pro-active than reactive about calls for proposals, and they tend to not prefer small grants to multiple organisations. A number of the foundations in our questionnaire data have supported very large initiatives, which is also a trend in public research councils. One foundation was very clear about their support for both large and long-term, and small and short-term projects, but support is typically large and long-lasting. Evaluations are always or often conducted. There is a high number of partnerships with others, and this is always the case for the largest foundations. These partnerships are primarily formed with other foundations and/or universities. Seven foundations reported on their partners, and in all cases they have multiple partners. The main reasons for these partnerships are pooling expertise/sharing information and increasing their impact.
The questionnaire data raised a number of interesting points to take to the in-depth interviews. While each interview had its own agenda, the semi-structured approach allowed for deviations. For this reason, the qualitative data are not directly comparable for all the interviewees. In this chapter, we seek to synthesise and group the data into some central dimension or themes. This is based on formal in-depth interviews, but also on informal discussions with foundation board members (outside the group of foundations that participated in the questionnaire) and policy makers. Generally, foundations and policy makers have a positive attitude towards foundations’ support for research and innovation. Both are aware of the social value of foundations providing financial resources and strategic direction to the overall research and innovation effort. Both emphasise the huge potential in enhancing this effort, but both also stress the importance of more dialogue and a change in culture so that foundations and their beneficiaries will become better at working together and understand each other’s objectives and modes of operation. On the policy side, there is strong support for public-private partnerships, of which research and innovation is one example.

Some of the identified obstacles are: i) a latent scepticism in the university system towards private sector interference in public research, which should not be biased by special interests, and, following on from this, possible conflict between private and public objectives when deciding national research strategy; ii) university bureaucracy and outdated barriers between scientific disciplines; iii) some remaining ignorance among foundation directors concerning the nature and limitations of the research environment at modern universities; and iv) limitations in existing knowledge on the effects of various support activities.

One overriding issue is the coordination of private and public initiatives. Uncoordinated financing may lead to imbalance. Some research areas may become favoured by both parties while others are entirely neglected. This calls for dialogue between foundation representatives and government officials. Obviously, this dialogue should in no way intend to provide government direction for the research support provided by private foundations, but both sides may benefit from knowing the other’s plans which they make on their own.

In this regard, one critical issue is that both the government and foundations increasingly aim their support at large elite projects. Over the past few decades, the Danish government has allocated an increasing share of its resources to the discretionary control of research councils and other grantmaking bodies that are specifically intended to sponsor elite projects. Most of the large foundations support the same objectives. This makes for an increasing split in the opportunities for different research areas and research departments, since excellence is documented by past research performance. On the other hand, it is understood that universities have a general function of providing research and research-based education in
a number of areas of general social interest and significance. It may become increasingly difficult for the underprivileged research areas to fulfill and develop their functions if they are starved of funds. Adding to this problem is the knowledge that a lot of groundbreaking research is not based on track record but comes about more randomly. Many foundations and business leaders emphasise the importance of a good level of basic research funding and argue against detailed research planning.

Another issue is the level of funding forthcoming from foundations. As mentioned previously, most of the large Danish foundations are industrial foundations with a dual purpose of 1) ownership and governance of a company in that company’s best interest, and 2) donating to research and other charitable causes with any dividends received. This dual purpose means that industrial foundations donate a smaller percentage of their assets than non-industrial foundations, since they tend to reinvest more in their subsidiary companies. However, as Chapter 3 shows, there is little doubt that industrial foundations increase Danish research funding as a whole. One explanation is that the subsidiary companies have been quite successful and grown in size, which more than compensates for their higher reinvestment ratios. Reinvestment tends to increase the asset base and may lower donation ratios in the short run, but in the long run this will lead to more rather than less funding, if the funds are reinvested wisely.

A third issue is the absorptive capacity of the beneficiaries of private R&D donations. It may be argued that a given research institution, for example a research department or a university, has limited absorptive capacity in terms of talented researchers, research facilities etc. and that increasing donations, therefore, will be characterised by declining marginal productivity. This is illustrated in Figure 8.A. The concern here is that increased R&D donations may (at least in the short run) have a declining marginal effect. Thus, increasing donations from the present level may not lead to proportional increases in research output. Moreover, in this case, relatively small donations dispersed over a number of areas will have a stronger overall effect than concentrating them on a relatively small number of elite research groups.

Decreasing marginal productivity may be a realistic assessment of the short-term impact of partial research donations, other things being equal (i.e. for a given initial supply of researchers, university facilities etc). However, it is not clear that the same logic applies to systemic donations, where all research input is scaled up proportionally. For example, universities may source talented researchers from around the world, or they may build new research facilities etc. Under these circumstances it seems more realistic to assume constant or perhaps even increasing returns to scale, i.e. that research output increases proportionally or more than proportionally with the size of donations. This is illustrated in Figure 8.B.

However, to reap the benefits of systemic donations, it is necessary that foundations think big and scale up all their research input at the same time so that they avoid bottleneck problems and decreasing marginal productivity. These donations can take the form of new research centres with plans for new research facilities, externally recruited, predominantly international staff, new organisations etc. It is notable that systemic donations are likely to require substantial international involvement in order to escape national resource constraints, particularly in a small country like Denmark. The many unknowns in systemic donations will no doubt add to the risks already inherent in any research activity. However, it is not uncommon for risk and return to go hand in hand.
For large donations such as donations to research centres, both foundations and universities need to plan better for their exit when external funding ceases. It is important to take steps to integrate centres of excellence (as an example) with their long-term teaching and research activities. In contrast, this is less of a problem for smaller donations, which are more easily integrated, and for which it is easier to find additional funding if necessary.

Increased internationalisation to overcome domestic resource constraints may be necessary if foundations’ support is to increase, while at the same time retaining or enhancing its impact on research productivity. Historically, Danish foundations have mainly sought to enhance domestic research, but have always maintained a broad interpretation of what this might mean. In recent years, the larger foundations have emphasised the importance of internationalisation, albeit usually with a Danish partner institution.

To some extent, this domestic orientation is attributable to foundation charters, which in some cases oblige the foundations to support Danish research. However, these foundation charters may be changed, if it can be persuasively argued that external donations have changed in a way which makes it necessary to reinterpret the will of the founder, and particularly if national constraints impose artificial limits on the fulfillment of a foundation's purpose. However, in most cases a foundation’s purpose is sufficiently broad to allow foundations to fund most international research activities, as long as it can be argued that it is somehow in the national interest.

Another barrier to internationalisation may be the mindset of foundation board members, 99% of whom are Danes. However, as mentioned previously, this has not prevented them from wholeheartedly supporting the internationalisation of Danish universities.
5 Innovative Examples

In this chapter, we describe three innovative examples in greater detail. These three examples have been identified from 1) the questionnaire data, where foundations were asked to provide examples – two out of seven foundations that support both research and innovation did just that, and 2) one of the interviews described in Chapter 2. We focus on successful projects, i.e. projects that are broadly considered to be successful, and the processes, procedures and tools used to achieve this.

5.1 Example 1

The first example comes from the Novo Nordisk Foundation. The Novo Nordisk Foundation is an industrial foundation. The objective of this foundation is to provide a stable basis for the commercial and research activities conducted by the companies within the Novo Group (Novo A/S is the holding company for the companies in the Novo Group) and to support scientific and humanitarian purposes.

Among other things, the Novo Nordisk Foundation aims at bridging scientific discoveries and commercial applications, and it has made a so-called innovation value chain with five stages. The different stages of the value chain require different types of support, and the foundation covers the entire innovation value chain, directly or through its companies.

The 5 stages are:

1. During the research stage, the foundation supports research. The foundation facilitates the creation of research environments that focus on creativity, which is intended to create favourable conditions for making application-oriented discoveries with commercial potential.
2. The explorative pre-seed stage supports tests of whether the first-stage research works in practice. A pre-seed grant to test and further develop research ideas can be applied for by researchers.
3. The pre-seed stage supports researchers that have largely finished testing the scientific and commercial potential of their research. In both pre-seed programs, in addition to any grants, the foundation supports the process of maturing ideas. This may be done in cooperation with Novo A/S.
4. During the seed stage, Novo A/S invests in a company and starts exercising more direct influence by, for example, appointing board members.
5. During the venture stage, if the seed stage company continues to show promising commercial potential, Novo A/S may make an additional and substantial venture capital investment to further develop the concept and the company.

Galecto Biotech is one example of an innovative outcome of this approach. Galectins (galactoside-binding lectins) are a group of proteins that are involved in many disease processes such as fibrosis, cancer and inflammation. Based on extensive research in this field, Galecto Biotech has developed a series of galectin
modulators that have shown promising effects in several disease models. The company’s main project focuses on an inhibitor of galectin-3 being developed for treating fibrosis, with idiopathic lung fibrosis as the primary indication. The Novo Nordisk Foundation awarded Galecto a pre-seed grant of DKK 625,000 (€83,775) in 2010, and the company subsequently received a seed investment from Novo Seeds as its first investor, which enabled Galecto Biotech AB to be established in 2011. The founder group comprises leading researchers and biotech entrepreneurs from Sweden, the United Kingdom and Denmark. The investor base has since expanded to include three venture capital funds: Merck Serono Ventures, Seed Capital and Sunstone Capital. The company builds on more than 10 years of research into galectins and galectin modulators, which combined with a strong patent estate, gives Galecto Biotech a unique platform. Novo Seeds has invested DKK 12.4 million (€1.7 million) in Galecto Biotech. [6]

5.2 Example 2
The second example comes from a non-industrial foundation. Realdania is actively involved in most of the projects that it supports; it wants promote its own strategic approach, where agenda-setting initiatives and the dissemination of knowledge is considered as important as individual physical projects, and thus carefully selects which projects to support. These projects are often innovation projects. Realdania emphasises that change requires a collective impact, and thus encourages multidisciplinary coordination and collaboration. Since the year 2000, it has funded or co-funded more than 2,000 projects, of which 700 are currently active.

The toolbox consists of:

1. Evaluation and learning. Realdania sees itself as a learning organisation that relies on systematic evaluation to monitor the outcomes of our grants and activities. It focuses its efforts on establishing systems that facilitate learning and sharing knowledge about what works and what could be improved.
2. Partnerships and collective impacts. Through cross-sector partnerships, Realdania seeks to secure that the knowledge acquired from projects is widely disseminated, and to engage in partnerships that create a sense of ownership, thus helping to ensure a community-wide impact.
3. Campaigns and calls for projects. Realdania, in its own words, ‘initiates campaigns and calls for projects to highlight specific challenges in society and create impact beyond that of a single project.’ One example is the campaign called ‘Future Suburbs,’ which has generated concepts for sustainable suburbs capable of adapting to climate change, increasing traffic and an ageing population, and which now serves as inspiration for the transformation of the Danish suburbs.
4. Exemplary values. Realdania wants all its projects to have exemplary value, and it seeks projects that break new ground and generate innovation. By engaging in projects that are inspiring and scalable, it aims to expand good solutions for a greater effect.

Another innovative example is climate change adaption and urban space development in the centre of Copenhagen. Realdania has launched the innovation project Klimaspring (Climate Leap), which focuses on collecting rainwater in dense urban areas. The point of this project is to promote good ideas and solutions for climate change adaptation and to help the best ideas develop into viable business ideas. In extreme

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For more, see the publication "Why and how?" from the Novo Nordisk Foundation.
downpours, it is important to prevent the water from ending up in the city’s basements. A new combined climate change adaption facility and urban space in Sankt Annæ Plads, Copenhagen, serves the important purpose of draining rainwater into the harbour. A kind of riverbed between the trees which was designed as a depression in the terrain and lined with two rows of granite steps can hold large amounts of rainwater when the sewers fill to capacity. Under more normal weather conditions the area forms a new green urban space.

5.3 Example 3

Our final example is a special construct in this respect. The Danish National Research Foundation is an independent organisation established by the Danish Parliament in 1991 with the objective of promoting and stimulating basic research at the highest international level at the frontiers of all scientific fields. The Centre of Excellence Program is the main funding mechanism, but a number of other programs and initiatives have also been launched specifically targeted at increasing the level of internationalisation of Danish research communities. Since its establishment, the foundation has committed itself to supporting Danish research with more than DKK 6 billion DKK (EUR 800 million).

The Centres of Excellence consist of units based in research institutions (the vast majority in universities) sharing a common idea or vision and an overall and clearly defined set of research objectives. There is no fixed formula for creating a Centre of Excellence. The centres may differ in size and mode of organisation, depending on their subject and scope, although they must have a well-defined framework for cooperation.

The application process consists of two stages. During the first stage, prospective centre leaders are invited to submit letters of interest with short outline proposals. These proposals are then processed by the board acting alone. During the second stage, applicants submit full applications that are thoroughly scrutinised by a set of international experts in the field. Prior to final selection, the board meets each applicant.

The foundation emphasises the following aspects:

- The research idea is ambitious and original and has the potential for real scientific breakthrough in the relevant scientific field(s).
- The proposed centre leader has a high standing in the international scientific community as well as managerial skills.
- The centre includes high-quality personnel in order to establish a creative and dynamic international research environment that will provide an inspirational training ground for young scientists.
- The focus, structure and size of the proposed centre is such that it sets the stage for scientific ventures that are not feasible with conventional funding from other sources.

A centre grant constitutes two periods of six and four years, respectively. A mid-term evaluation is conducted after five years and a final evaluation is made after nine years. Follow-up meetings are held annually with each centre and the centres are asked to submit annual reports.
In December 2013, an international panel evaluated the Danish National Research Foundation again. The panel concluded that the Foundation and the Centre of Excellence initiative have had a very positive impact on the quality of research in Denmark and recommended that the Foundation be refunded. The key topics addressed in the evaluation were the role of the Foundation in the Danish research funding system, research quality, research training and recruitment, internationalisation, interaction with host institutions, and the governance and management of the DNRF. This evaluation was based on a bibliometric study, a self-assessment report by DNRF, and numerous interviews and desk studies.

The Centre for GeoGenetics is one good example. This centre is financed by a five-year grant from the Danish National Research Foundation. Ancient DNA research has progressed from the retrieval of short fragments of DNA from bones to large-scale studies of ancient populations, past ecosystems and even whole nuclear genomic sequences. The Centre for Geogenetics has positioned itself in the technological forefront of all this. With the use of a multidisciplinary team, new methodologies and access to highly unique specimens and sampling sites, the centre intends to readdress some of the most debated scientific topics in the past few decades – carefully chosen with a strong belief that ancient DNA research can provide fundamentally new insights, or even shift current paradigms. Geogenetic research can have a direct and positive impact on society, because the technique for finding faint DNA traces also opens up brand new vistas in medicine. Geogenetic methods are, for example, used in the Pathogen project, which seeks to break new ground in cancer research.
6 Conclusions

Foundations play a crucial role in the support of Danish research and innovation. Donations have been increasing and are set to continue to increase in the years to come. One special characteristic of Denmark is the predominance of industrial foundations, i.e. foundations that own companies, which account for the bulk of total assets, as well as research and innovation funding. However, only a few large industrial foundations have been established during the past 20-30 years, which makes it necessary to inquire whether changes in regulation are necessary to secure future sources of funding.

The increasing importance of foundations in funding research in universities and other government institutions raises the issue of how these donations are accounted for and how it affects the government’s commitment to the Barcelona goal of spending 1% of the GDP on research. If this goal is maintained, one unintended consequence could be that increased private funding ends up crowding out government funding, so that total research funding is unchanged despite every intention to increase research investment. We need greater transparency in government to account for research investment.

The continued growth in foundation funding also calls for new ways of interaction with universities and other research institutions, including coordination with public policy makers, overcoming cultural barriers, and eliminating artificial institutional barriers within the university system. A cultural change is necessary both in foundations and their recipient organisations. Universities need to become more flexible and less bureaucratic in accommodating legitimate donor wishes and in making efficient use of resources, and, at this point in time, universities also need to become better at saying ‘no’ if they do not have the administrative or scientific competencies to handle a large project. The foundations themselves need a better understanding of the research processes in state-owned universities and the inherent constraints.

Funding by private foundations rests on a delicate balance between trust and control. Monitoring by steering groups and milestones may enhance efficiency, but overly zealous control mechanisms risk jeopardising the trust and gratitude generated by donor relationships. Many foundations care deeply about social outcomes, and research is a means to reach these outcomes as well as being a goal in itself. To meet such challenges, universities need to lower institutional barriers between scientific disciplines, as well as between research and commercial or practical applications.

Professionalism should increase with donations. This includes more systematic grantmaking and better follow-up and impact assessments. While elaborate mechanisms may not be necessary or worthwhile for smaller foundations that spend limited amounts on research and innovation, it seems natural to adopt a more systematic approach for larger budgets and donations. The general understanding is that the largest Danish foundations have already become more professional in this respect, but that there is still some way
to go, particularly since professional best practice standards are continuously evolving. There may also be some catching up to do for the mid-size foundations.

Finally, foundations’ support of R&D will only be effective if there is funding from the government. Universities need to secure a basic level of research funding in order to maintain research-based teaching and fungible research environments, even in areas which are not currently deemed to be fashionable or ‘world class.’