

The Economic Effects of Design

September 2003

Preface

Design is a central element in the cultural and experience economy, which is one of the major economic growth areas in Denmark. Even now, one in eight employed in the private sector works within the experience economy, accounting for approx. 5.3% of GDP. Within the last decade, the design industry has achieved 20% annual growth, which seems to constitute a trend.

If continued growth and the affluence of the welfare state are to be sustained, we need to show strength within future growth areas. In the future, Denmark will increasingly need to compete on knowledge, development and innovation. This is where design plays a central role. Good design renders products and services a combination of functionality, user friendliness and sound choice of material.

Businesses and decision-makers have lacked relevant information on the effects of design on national and business economics. This is why the National Agency for Enterprise and Housing has initiated the creation of a knowledge base on the economic effects of design.

The survey has been conducted by the Danish Design Centre in collaboration with Advice Analyse, I&A Research (information gathering) as well as Anders Holm and Bella Markmann, Copenhagen University (methodology and computing).

The survey shows that design makes a difference in private business. Adopting a comprehensive and systematic approach to design enhances the value of the enterprise, and Danish companies see a clear difference on the bottom line.

This report is pioneer work since no other analysis has been carried out before anywhere. I would like to thank all the companies that have taken the time to help us compile this unique material.

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1 Survey summary

Design pays off. Companies that adopt a comprehensive approach to design make more money and generate more exports than companies that do not use design. That is the main finding of this report, which analyses the economic effects of employing design. The survey is the first of its kind internationally and represents entirely new knowledge, with the advantages and limitations this affords.

The survey is based on 1,000 telephone interviews with private Danish companies with a minimum of 10 employees and examines:

- The total investment in design.
- Gross revenue performance and the development in employment and export share of turnover among Danish companies with a minimum of 10 employees.
- The difference in gross revenue, employment and exports for companies that adopt a comprehensive approach to design compared to those who do not use design.

The survey defines design as:

“When we speak of design we mean design strategies, development and styling – everything that takes place prior to production or implementation of products (printed matter, sales fair stalls, web sites, interiors, etc).”

There is marked correlation between the use of design and the economic performance of companies and subsequent macroeconomic growth. Furthermore, it is apparent that companies where design is a core issue and which purchase design services both internally and externally perform better¹.

Employing design yields great benefit. This is the clear message the analysis conveys, which is substantiated by the general tendencies it identifies.

However, the analysis constitutes an insufficient basis on which to conclude the precise share of the economic growth that can be attributed to design. To isolate and weigh design's share would require a more comprehensive survey and greater in-depth analysis.

The analysis provides hard facts rather than case-story exemplification on which to base further discussion on the benefits of design investments and greater professionalism in the employment of design.

The following lists the key findings of the analysis:

¹ Whether to have an internal design unit and thus indirectly buy the design services internally or to buy them from outside the company are partially regarded as investment decisions each containing certain pros and cons.

The main conclusions

- Danish companies invest an annual DKK 5 billion in the external procurement of design and approx. DKK 2 billion in internal design purchases, which represents an annual total investment of approx. DKK 7 billion. The effect of public investments in design in narrow terms, the resources devoted to design education and research and the annual DKK 12.5 million of public funding invested in the promotion of design, has not been subject to study in this survey.
- Danish companies that purchase design have registered a total increase in their gross revenue over the past 5 financial years that is approx. DKK 58 billion higher than that for companies, which do not purchase design. This equates to approx. 22% above-average growth in gross revenue.
- Companies which have experienced an increase in design activity (i.e. in investments in design-related employee training or external procurement of design services) achieve an additional 40% gross revenue increase compared to companies where design activity is either constant or has decreased.
- Companies that employ design professionals and purchase design externally export 34% of their turnover on average compared to 18% by companies that have adopted a different design purchasing behaviour or none at all.
- There is positive correlation between design and employment since job creation is higher in companies that employ design compared to companies with no design activity.
- Gross revenue performances are better and exports are marked higher the higher on the design ladder² that companies rank. The wider macroeconomic benefit of higher turnovers and gross revenues has not been subject to study in this survey. However, there is reason to believe that the benefits of design to the wider economy are even greater than substantiated by the report.
- The survey identifies approx. 50% of companies with a minimum of 10 employees as non-design companies whereas only a minority (approx. 6%) have a solid design base. Accordingly, there is great economic potential for society as a whole in enhancing the design behaviour of business.

² The design ladder is developed by the Danish Design Centre and represents four different levels of company-based employment of design: non-design, design as styling, design as a process and design as innovation.

2 Survey background

The National Agency for Enterprise and Housing commissioned the Danish Design Centre to conduct a survey with the aim of identifying and documenting the macroeconomic effects of design, i.e. examine the given economic effects of employing professional designers by Danish companies.

Until now, no such quantitative economic analysis has been conducted, and subsequently the current analysis is the first of its kind internationally. The aim has been to clarify whether claims of the economic benefit of hiring designers – often based on case stories – can be substantiated by hard facts.

Design is often regarded as a soft parameter – on par with human resources and marketing – which is difficult to quantify since its mechanism cannot be defined in isolated terms. While marketing within the recent 10-15 years has been granted individual status in company accounts, the economic benefits of design are still difficult to identify due to the comprehensive nature of the activity.

Therefore, this survey should be regarded as the first step towards developing a method base with which to assess the economic benefits of design. It also constitutes the natural point of departure for follow-up surveys producing annual assessments within defined areas – e.g. in collaboration with Statistics Denmark (Danmarks Statistik).

3 Methodological considerations and choice of method

Narrowing the choice of method

There is no established methodological platform on which to build an analysis of the economic effects of design. Preliminary research registered a handful of international surveys that touch on the topic. Yet a comprehensive overview of economic and design-related parameters, which this survey seeks to establish, does not currently exist. Therefore, a methodological platform must be developed.

Research conducted by scholars in macroeconomics establishes that a comprehensive survey of the macroeconomic impact of design would far exhaust the resources and time frame allocated to the survey. Subsequently, the objective of the analysis has been limited to meeting relevant intermediate targets within the framework of allocated resources.

Design is a very wide concept, which is why reservations should be stated as to the overall feasibility of quantifying the effect of design. It should additionally be presupposed that the definition of design will vary among survey respondents, including such factors as which employees can be considered design professionals and which business partners can be considered professional design firms. This problem has been addressed in different ways, first and foremost by predefining design prior to each interview.

The analysis adopts the following definitions of design:

“When we speak of design we mean design strategies, development and styling – everything that takes place prior to production or implementation of products (printed matter, sales fair stalls, web sites, interiors, etc).”

The definition of designers (and design activity), in relation to the assessment of internal design investment, is narrowed down to professionals that have graduated from the main design and architecture academies in Denmark and to the disciplines they represent. However, It would be prudent for future surveys to include graduates from new design programmes, such as the design programme at the Technical University of Denmark and the design management programme at the Copenhagen Business School.

Method

The survey investigates the economic effects of design over a five-year financial period. The survey is based on a combination of telephone interviews and data from Bonnier’s Newbiz Business Information System³.

³ Information provided by Bonnier’s Newbiz Business Information System is based on the company register pertaining to the Danish Commerce and Companies Agency as well as other official state information channels, Kompass and TDC, cf. www.newbiz.dk.

Prior to conducting the survey, preliminary interviews were made to secure the validity of the interview data, i.e. to make sure the companies were able to understand and answer the questions posed in the interviews.

The main focus of the survey was to narrowly examine:

- The macroeconomic benefit of design.
- A possible method by which to measure the benefit of investments in design and design promotion.

These issues have been examined on the basis of the following data:

1. How great is the public investment in the promotion of design?

Data from the National Agency for Enterprise and Housing (EBST) regarding the funding of the Danish Design Centre and other design promotional activities.

2. How great is the current investment by purchasers of design?

Data compiled on the basis of the following sub-questions:

2.a How many designers have the design purchasers hired within the recent 5 years?

Data (2.a): Interviews with approx. 1,000 Danish companies compared with fiscal data and staff figures.

2.b How much design work has been purchased within the recent 5 years?

Data (2.b): Interviews with approx. 1,000 Danish companies.

2.c How much design work has been purchased abroad within the last 5 years?

Data 2.c: Interviews with approx. 1,000 companies regarding the international purchase of design.

3. What is the economic impact of design investments?

Data (3):

a: Interviews with approx. 1,000 companies regarding gross revenue and export performance as well as their ranking on the design ladder.

b: The survey answers are compared with accessible public records.

The data provides an overview of:

- The total investment in design.
- Gross revenue and employment performance plus an indication of export performance.
- The benefit to gross revenue performance and employment with companies that invest (a lot) in design compared to those who do not invest (a lot) in design.

4 Survey presentation

A total of 1,074 telephone interviews were conducted with companies with a minimum of 10 employees.

To ensure statistical validity, the random survey is based on four quota groups of approximately equal size representing company employment.

The quota groups consist of:

- 263 companies with 10-19 employees (representing 47% of industry)
- 267 companies with 20-49 employees (representing 33% of industry)
- 267 companies with 50-99 employees (representing 11% of industry)
- 277 companies with 100+ employees (representing 9% of industry)

The datasets were randomly compiled from the Bonnier's Newbiz Business Information System, which contains names, addresses, telephone numbers, trade codes as well as key fiscal figures and staff figures over the last 5 financial years. The key fiscal figures and staff figures are integrated with the interview data.

To enhance validity, an extra precaution has been undertaken to scrutinise the companies in order to eliminate overtly incorrect answers in relation to the number of design professionals employed. Accordingly, e.g. advertising agencies, printers and architectural firms have been eliminated. This should provide a more accurate picture of how many 'real' design professionals are employed by the companies. The number of survey interviews was thus reduced to 1,016. This data will allow a more conservative estimate of the effects of employing design.

The respondents were the company design managers. Naturally, many companies do not have a design manager. In almost 460 cases, the companies did not wish to participate, since design did not play a role for the company. Therefore, it may be assumed that the 1,016 participating companies were exceptionally interested in design.

To achieve a more balanced picture, the (reduced) dataset of 1,016 completed interviews was expanded to include the 460 companies that did not wish to participate due to lack of interest in design. The random survey is thus constituted by a base of 1,476 companies, which is the figure the analysis employs in generating key figures for further calculation. The modified random survey base ensures that the results of the analysis are based on data from a cross-section of companies and not only on the design conscious segment. However, the assessment of the economic effects of design is based on the net figure of the random survey, i.e. the total of 1,016 completed interviews. The average results of companies that purchase design are compared with those from companies that do not purchase design. Thus individual companies and not populations are in focus.

Extending the data to include the 460 companies requires that they are evenly distributed among the 4 size categories of the population. These companies will be registered as ‘invalid’ in the tables – i.e. as empty cases – since the interviews were not carried out. Otherwise they figure as not using design, thus reducing the effects thereof.

Table 4.1 Random survey

	Number	Percentage
10 – 19 employees	361	24.4%
20 – 49 employees	369	25.0%
50 – 99 employees	383	24.6%
100+ employees	383	25.9%
Total	1.476	100%

To achieve a balanced picture, the survey findings have been modified to represent all Danish companies with a minimum of 10 employees. The purpose of this is to adjust the survey data factors to correspond with the total population.

The following factors have been employed:

- Companies with 10-19 employees – factor 1.944959
- Companies with 20-49 employees – factor 1.322598
- Companies with 50-99 employees – factor 0.44792
- Companies with 100+ employees – factor 0.341866

The random survey following the modification:

Table 4.2 Random survey – modified

	Number	Percentage
10 – 19 employees	702	47.3%
20 – 49 employees	488	32.9%
50 – 99 employees	163	11.0%
100+ employees	131	8.8%
Total	1,484	100%

This corresponds to the distribution within the total population.

It is evident that the total number of companies has risen by 8. Mathematical rounding off of figures is necessary to achieve a correct proportionate distribution between the different size categories. Although modifying figures renders the analyses more difficult to comprehend it is necessary in order to achieve a precise picture. Decimals have in most cases been included in the tables to facilitate calculation. However, in some tables there are exceptions where rounding off leads to irregular bottom-line totals.

Trades

The question as to the nature of trade was posed as an open question. For statistical convenience, and to facilitate comprehension, the report categorises all trades according to two overall categories. Further subdivision would result in trade categories too small to substantiate statistical analysis.

Table 4.3 Companies by trade

	Number	Percentage	Percentage/ invalid
Production	324	21.8%	31.8%
Commerce & Service	693	46.7%	68.2%
Total	1017	68.6%	100%
Missing	467	31.4%	
Total	1,484	100%	

This seems a convincing representation in relation to the 16,060 strong company list, provided by Bonnier’s Newbiz Business Information, where the proportional representation is:

- Production companies: 29% (4,627 companies)
- Commerce/ service companies: 71% (11,433 companies)

Four design profiles

The random survey can be subdivided into four different design profiles⁴:

- Companies that do not use design
- Companies that only purchase design internally in the form of staff design training
- Companies that only purchase design externally from outside design providers
- Companies that purchase design both internally and externally

Table 4.4 Company design purchase profile in relation to size

Design purchase profile		10-19 employ.	20-49 employ.	50-99 employ.	100+ employ.	Total
Do not purchase	Number	379	238	76	51	744
	%	54.9%	49.8%	47.2%	40.2%	51.1%
Purchase externally	Number	261	189	62	48	560
	%	37.8%	39.5%	38.5%	37.8%	38.5%
Purchase internally	Number	27	15	10	7	59
	%	3.9%	3.1%	6.2%	5.5%	4.1%
Purchase internally and externally	Number	23	36	13	21	93
	%	3.3%	7.5%	8.1%	16.5%	6.4%
Total	Number	690	478	161	127	1,456
	%	100%	100%	100%	100%	100%

⁴ In total, 1,456 companies have provided survey answers allowing them to list them within four profiles. 29 were unable to answer the questions.

Analysis – The economic effects of design

About half of the companies do not use design at all while the rest employ design in various degrees.

5 The investment in design by Danish companies

The internal investment in design

This chapter describes the internal investment in design by individual companies, i.e. staff salaries paid to design professionals working with design. The investment is assessed on a company level and on a national level.

Number of employed design professionals

The table below illustrates the number of designers the company has employed.

Table 5.1 Number of design professionals in the company

	Number of company staff	Number of companies	Number of design professionals	Percentages (rounded off)	Percentages (not rounded off)
Valid answers	0	839	0	56.6%	84.7%
	1	78	78	5.2%	7.9%
	2	28	56	1.9%	2.9%
	3	18	54	1.2%	1.8%
	4	5	20	0.3%	0.5%
	5	10	50	0.7%	1.0%
	6	3	18	0.2%	0.3%
	7	1	7	0.1%	0.1%
	8	3	24	0.2%	0.3%
	9	0	0	0.0%	0.0%
	10	3	30	0.2%	0.4%
	11	0	0	0.0%	0.0%
	25	1	25	0.1%	0.1%
	100	0	0	0.0%	0.0%
	Total	991	362	66.8%	100%
Missing		493		33.2%	
Total		1,484		100%	

839 + 493⁵ or 89.8% (56.6% + 33.2%) of all Danish companies have not employed professional designers. 150 (or 10%) of all Danish companies employ between 1-25 professional designers, although most employ between 1-3 professional designers.

In general, companies employ few designers – a total of 360 designers among the surveyed companies. On the whole, this matches information from the Association of Danish Designers quoting that most designers within the Danish design industry are either self-employed or assigned to design firms that offer their services on a consultancy basis.

⁵ Companies that did not wish to participate in the survey since design was not of relevance to them have been categorised as ‘missing’.

The internal investment in design, according to the survey

The random survey registered 360 design professionals, which represents an investment of approx. DKK 10.5 -15.6 million⁶ a month, or approx. DKK 126 - 190 million annually.

Internal company investments in design

Approx. 150 surveyed companies with designers on the payroll employed a total of 360 designers, which averages 2.5 designers per company. Based on average salaries, this equates to an average annual investment of between DKK 836,824 and 1,250,504 per design purchasing company.

Other staff

Companies employ members of staff other than design professionals who work with design. The survey identifies the number of additional non- professional designers employed in working with design as equalling the number of hired design professionals, irrespective of company size and trade. Therefore, this non-professional group does not represent an identifiable individual economic effect.

The internal investment in design on a national level

The modified random survey represents 8% of the total population of companies with a minimum of 10 employees. On a national level, the total investment in design professionals for companies with a minimum of 10 employees is approx. DKK 1.57 - 2.37 million annually, which represents approx. 5,160 design professionals on a national level.

The development in employment of design professionals

The development in the employment of design professionals over the last 5 financial years has in the case of 10% of companies been on the increase, whereas 87% of companies have not experienced any development. On average, there has been a slight total increase. The increase in the employment of design professionals is proportional to the size of the company.

The company external design investments

The major part of investments in design by Danish companies is allocated to external purchases in the form of consultancy services from design companies. This chapter describes the external design investment by companies and the size of their investment.

Table 5.2 Do companies purchase design externally

		Number	Percentage	Percentage/ valid
Valid answers	Yes	671	45%	66%
	No	341	23%	34%
	Don't know	4	0%	0%
	Total	1,016	69%	100%

⁶ Based on an average monthly salary for non-professionals of DKK 25,638 and for professionals DKK 38,312 (source: The National Union of Technical Staff and the Union of Salaried Architects).

Invalid answers		468	31%	
Total		1,484	100%	

The table shows that out of 1,016 companies initially selected for the survey, 671 (almost 2/3) of the responding companies purchase design externally, and in relation to the modified random survey segment this still represents almost half – and more than 4 times as many as those who hire design professionals in house.

On the whole, external design procurement has been constant for 46.6% of the surveyed companies and increasing in 45.2% of the cases. The increase in external procurement is higher than the increase in design professionals hired by the companies, which in turn has only risen 10% over the last 5 financial years.

The analysis compares the external procurement of design service with the gross revenue of the previous financial year in order to identify to which degree the development in external design procurement is related to a healthy economy and strong liquidity. No statistically significant differences in the procurement of design have been detected between companies with favourable or less favourable gross revenue the previous financial year (i.e. not only companies with a relatively strong liquidity investment in design).

Nor have differences been detected between companies of different size (i.e. investment in external purchase is not related to the size of the company)⁷. The proportion of companies that experience a rise in their external procurement of design is significantly larger within commerce and service.

External procurement abroad

As the table below shows, most Danish companies purchase design from Denmark

Table 5.3 The share of external design services purchased abroad

		Number of companies	Percentage	Percentage/ Valid
Valid answers	0%	559	37.7%	86.1%
	1-10%	31	2.1%	4.8%
	11-20%	2	0.1%	0.3%
	21-30%	16	1.1%	2.4%
	31-40%	1	0.1%	0.2%
	41-50%	10	0.7%	1.6%
	51-60%	4	0.3%	0.6%
	61-70%	2	0.2%	0.4%
	71-80%	7	0.5%	1.1%
	81-90%	1	0.1%	0.2%
	91-99%	3	0.2%	0.4%

⁷ One of the reasons why the Danish Design Centre has developed the design ladder is that investment in design tends to relate to behaviour rather than the size of a company.

	100%	11	0.7%	1.6%
	Varied	0	0.0%	0.1%
	It varies	1	0.1%	0.2%
	Total	649	43.8%	100%
Invalid answers/ Missing	I/T	347	23.4%	
	Don't know/ No answer	21	1.4%	
	Invalid	467	31.4%	
	Total Missing	834	56.2%	
Total		1,484	100%	

Only 6% of all Danish companies purchase design abroad (100% - (37.7% + 56.2%)). Of surveyed companies that purchase external design services, 86.1% only purchase from Denmark.

On average, 13.9% of companies, which purchase design, purchase between 1 and 100% abroad. Only 1.6% of all the companies purchases all services abroad, while 4.8% of all the companies purchase between 1-10% abroad. Therefore, only a marginal amount of design purchase by Danish companies is made abroad⁸.

It is no surprise that of the companies which purchase design abroad, the larger the company is, the more foreign purchases they make. The difference is statistically significant. Another group that purchases a significantly larger proportion of their design services abroad are commerce and service companies.

Foreign purchases are on the rise for 25.7% of the companies. The question is, which companies purchase more abroad?

Significantly more medium-size companies are increasing their share of foreign purchase whereas there seems to be no movement when it comes to major corporations. Once again, commerce and service companies register a significantly larger increase in foreign purchases.

There are still very few companies that purchase design abroad. However, there are signs of change, especially within commerce and service and medium-size companies, irrespective of their trade.

Development in volume of design work

The survey furthermore investigates whether the volume of design work has increased, decreased or is unchanged.

⁸ A qualitative survey of the need for in-service design management training, currently being conducted by the Danish Design Centre, identifies specialised services catering to a narrow target group as the chief design services that are purchased abroad.

Table 5.4 5-year development of total volume of design work

		Number of companies	Percentage	Percentage/valid
Valid answers	Decreasing	35	2.3%	3.9%
	Constant	479	32.3%	54.1%
	Increasing	372	25%	42%
	Total	885	59.7%	100%
Invalid answers/missing	I/T	92	6.2%	
	Do not know/ Will not answer	40	2.7%	
	System	467	31.4%	
	Total	598	40.3%	
Total		1,484	100%	

As identified in table 5.4, design is a growing factor. 42% of companies confirm this trend, whereas only 3.9% experience a decrease. With regard to companies that expand their design activities, the survey shows that the larger the company is, and the higher the gross revenue the previous year, the greater the increase in design works. This difference is statistically significant.

How much do Danish companies invest in design?

Of the 671 companies that purchase design externally, 350 quote the size of this investment. See table 5.5.

Table 5.5 Estimated investment in external purchase

Design purchaser profile	Average	Number of companies
Purchase externally	DKK 610,805	302
Purchase internally and externally	DKK 605,226	48
Total	DKK 610,043	350

The surveyed companies that purchase design externally spend an average DKK 610,805 on external purchases, and companies that purchase design both externally and internally spend on average DKK 605,226 on external design purchase. Based on these figures, the calculated average investment for all companies that purchase design externally is DKK 610,043.

Adopting an estimated average of DKK 610,043 for all 321 surveyed companies, which do not quote their expenditures⁹, the total procurement of external design¹⁰ for all surveyed companies amounts to DDK 409 million annually.

The total national investment in design

⁹ 671 - 350 = 321 companies.

¹⁰ 671 times DKK 610,043 = DKK 409,338,553.

The result of our random survey, representing 8% of the entire population of companies with a minimum of 10 employees, indicates that the total investment in external design of all companies of this size amounts to DKK 5 billion¹¹.

Total national investment in numbers

The total investment on internal and external design procurement for all companies with a minimum of 10 employees in numbers:

External design purchase:	DKK 5 billion
Internal design purchase:	DKK 1.6 – 2.4 billion
<u>Total annual design investment:</u>	<u>DKK 6.6 – 7.4 billion</u>

Summary – internal and external purchases

The annual investment in design on a national level is DKK 6.6 - 7.4 billion of which DKK 15 million represents public funding invested in design promotion. The following analysis seeks to establish whether this investment pays off.

¹¹ 409,338,553 multiplied by 8, times 100 = DDK 5,116,735,663

6 The results of Danish companies in relation to design

This chapter quotes company performance data of surveyed companies. The results are measured within three areas:

- Gross revenue performance
- Exports – share of turnover
- Employment - development

The gross revenue performance of companies

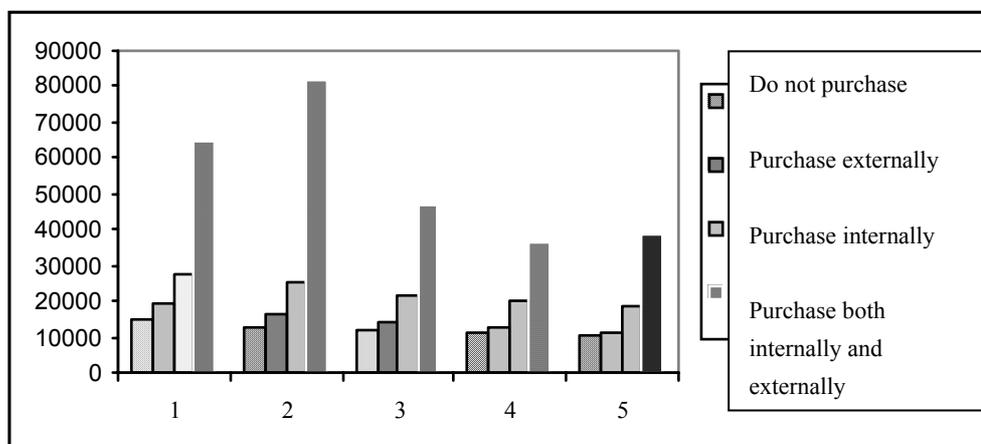
Here we study the gross revenue performance of surveyed companies pertaining to the 5 financial years of study (based on database information on 841 companies).

Table 6.1 Gross revenue performances in relation to the purchase of design

	Number of companies	Gross revenue performance over 5 financial years (averages in DKK 1,000)
Do not purchase design	241	DKK 4,029
Purchase design internally and/or externally	579	DKK 10,298
Total	820	DKK 8,455

The table shows that companies that employ design have achieved higher gross revenue growth rates over the recent 5 financial years compared to companies that do not employ design. The figures are statistically significant. The survey proves that companies that employ design achieve higher growth than those that do not employ design. The growth in gross revenues is almost 22% higher for companies that employ design compared to companies in general.

Graph 6.1 The gross revenue performance over the last 5 financial years



The graph illustrates performance within each of the 5 financial years.

The next table takes a more nuanced look at the use of design at 820 companies (where data is available) in order to study the correlation between gross revenue performance and design behaviour.

Table 6.2 Gross revenue performances in relation to purchase of design internally and externally

Design purchase profile	Gross revenue performance (recent 5 years) (average in DKK 1,000)	Number of companies
Do not purchase design	DKK 4,029	241
Purchase design externally	DKK 8,104	456
Purchase design internally	DKK 9,089	54
Purchase design internally and externally	DKK 25,887	68
Internally and externally in total	DKK 10,2978	579
Total	DKK 8,455	820

The table points to a correlation between average gross revenue growth and the purchase of design. Companies that only purchase design externally achieve gross revenue growth rates that are twice as high as those companies that do not purchase design. Companies that employ design professionals have a slightly higher advantage, and companies that employ design professionals as well as purchasing design externally achieve marked better results. However, only companies that purchase design both internally and externally achieve results that are statistically significant in the context of this survey. Group 3 is tentatively significant. The other deviations can – in theory – be attributed to statistical uncertainty, but they are probably reliable tendencies and will be studied closer in the following.

Table 6.3 The development in gross revenue in relation to changes in design activity

Design work (total volume)	Gross revenue performance (recent 5 financial years) (average in DKK 1,000)	Number of companies	Changes in % in relation to average
Constant	DKK 5,423	394	
Decreasing	DKK 18,671	27	
Constant or decreasing	DKK 6,270	421	-29.7%
Increasing	DKK 12,470	313	39.9%
Total	DKK 8,915	734	0%

The group of companies experiencing decreasing design activity nonetheless achieve high gross revenue growth. However, this group is very small (27). When the groups that experience either constant or decreasing activity are pooled, they represent a 50% lower growth rate compared to those experiencing an increase in design activity. The difference detected lies within the recognised confidence interval, although only just. Nevertheless, it can credibly be inferred that there is with great probability a correlation between increasing design activity and 50% higher growth rates compared to companies that either experience an unchanging or decreasing design activity. In relation to the total gross revenue average of the survey, this computes to an added gross revenue of approx. DKK 3.5 billion over 5 years.

Company exports

This chapter deals with the share of company turnover stemming from exports (based on interviews with 887 companies).

Table 6.4 Export in relation to design procurement

	Exports in percent of turnover in %	Number of companies
Do not purchase design	17.64%	260
Purchase design internally and/or externally	18.49%	660
Total	18.25%	920

The same performance tendency documented with company gross revenue applies to exports, namely that companies that purchase design perform better than those that do not employ design. However, the figures are not statistically significant.

Table 6.5 Export share of turnover in relation to the purchase of design internally and externally

Design purchaser profile	Export share of turnover in %	Number of companies
1 Do not purchase design	17.64%	260
2 Purchase design	15.75%	528
3 Purchase design internally	21.57%	47
4 Purchase design internally and externally	33.70%	86
Total internal and/or external purchase	18.49%	660
Total	18.25%	920

The same performance tendency documented with the correlation between gross revenue performance and design behaviour is identified with exports in relation to design behaviour, namely that companies which purchase design either internally

or externally differ significantly in performance from the three other groups. On average, exports account for 33.7% of company turnover in comparison with the general average of 18.25%. The survey shows that companies which purchase design services externally, as well as employ design professionals themselves, generally export considerably more than companies on average, and far more than companies with no or limited design behaviour.

Table 6.6 Export share of turnover in relation to change in design activity

Design work (Total volume)	Export share of turnover in %	Number of companies
Constant	18.77%	336
Decreasing	24.22%	52
Constant or decreasing	19.51%	389
Increasing	19.04%	301
Total	19.30%	689

Export share in relation to design activity yields no perceivable statistically significant benefit.

Company employment development

This chapter studies the development of employment in the surveyed companies over the last 5 financial years based on database information of 878 companies.

Table 6.7 Employment in relation to the procurement of design

	Development in employment, increase in workplaces	Number of companies
Do not purchase design	7	241
Purchase design internally and/or externally	22	650
Total	18	891

The same performance tendency documented in relation to gross revenue and export share of turnover is identified with the development within employment, namely that companies using design achieve higher growth. However, the staff figures are not statistically significant, although they do concur with the other indicators.

Table 6.8 The development in employment in relation to the purchase of design internally and externally

Design purchaser profile	Development in employment, increase in workplaces	Number of companies
1 Do not purchase design	7	241
2 Purchase design externally	18	512
3 Purchase design internally	14	54
4 Purchase design internally and externally	52	83
Total internal and external design purchase	22	649
Total	18	891

A closer study of the use of design identifies marked higher growth in staff employment with companies that use design. However, the figures are not statistically significant and can only be seen as indicative of a tendency that is substantiated by other indicators.

Table 6.9 Development in employment in relation to design activity

Design work (total volume)	Development in employment, increase in workplaces	Number of companies
Constant	15	306
Decreasing	10	52
Constant or decreasing	15	358
Increasing	27	306
Total	20	664

The same developmental tendency applies to design activity. Companies that have increased the use of design achieve higher growth in employment, but the figures are not statistically significant.

Summary – gross revenue performance, export share of turnover and employment figures in relation to the use of design

The analysis documents that companies that employ design achieve higher gross revenue performances than companies that do not employ design. This especially applies to companies that purchase design internally and externally. There also seems to be a correlation between increased design activity and increased gross revenue performance. The same performance tendency identified with gross revenue performance also applies to export share of turnover and staff employment, i.e. a positive correlation between the use of design and the share of turnover represented by export and the number of design professionals employed. However, this only constitutes a tendency.

Correlation between results and the characteristics of design users and non-design users

The following chapter studies the correlation between gross revenue performances; export share of turnover and employment on the one hand and the size and trade of the company on the other.

The difference between design users and non-design users in relation to company size.

Table 6.10 Gross revenue performance of design users and non-design users in relation to company size

	Number of companies	Gross revenue performance (recent 5 financial years) (average in DKK 1,000)
Design users		
A 10-19 employees	266	2,673
B 20-49 employees	198	6,506
C 50-99 employees	69	15,530
D 100+ employees	45	63,646
Non-design users		
E 10-19 employees	138	1,976
F 20-49 employees	73	4,077
G 50-99 employees	22	5,283
H 100+ employees	8	34,797
Total	820	8,455

In general, the gross revenue performance of design users and non-design users differs in relation to their size, and in some cases the difference is statistically significant. Groups A, E and F generate the lowest revenues. Groups B, C and G are middle-range, whereas the large design-using corporations perform the best. H is situated between C and D. It is no surprise that size seems to be an important factor, yet within each size group design users perform better than non-design users. Thus, companies that employ design achieve higher growth rates than companies that do not use design, irrespective of size.

The development of staff employment and the export share of turnover do not exhibit significant differences between large and small companies. Thus, size only seems to influence gross revenue performance. In fact, design users seem to achieve marginally smaller export shares of turnover than companies of the same size that do not use design.

The difference between design users and non-design users in relation to trade

Table 6.11 Gross revenue performance of design users and non-design users in relation to trade

	Number of companies	Gross revenue performance (recent 5 financial years) (average in DKK 1,000)
Design users		
A Production	170	11,961
B Commerce/service	408	9,605
Non-design users		
C Production	103	4,644
D Commerce/service	138	3,567
Total	820	8,455

When categorised by trade, design using companies in general – both production companies and commerce and service companies – perform 3 times better than non-design users. However, the differences, although considerable, are not statistically significant.

Table 6.12 Export share of turnover with design users and non-design users in relation to trade

	Number of companies	Percentage of export revenue
Design users		
A Production	188	35.5%
B Commerce/service, design users	472	11.7%
Non-design users		
C Production	106	27.2%
D Commerce/service	154	11.0%
Total	920	18.3%

Indications are that design-using production companies export a greater share of their turnover than non-design users. However, design-using companies within commerce and service do not perform better than non-design using companies. Additionally, production companies export significantly more of their turnover than companies within commerce and service, irrespective of whether they employ design or not.

Table 6.13 Employment development with design users and non-design users in relation to trade

	Number of companies	Development in employment, increase in workplaces
Design users		
A Production	197	27
B Commerce/service, design users	453	20
Non-design users		
C Production	102	6
D Commerce/service	139	9
Total	891	18

There are considerable differences in the development of employment between design users and non-design users, especially among production companies, but also among businesses within commerce and service. Design users appear to perform far better, although the differences are not statistically significant.

Summary – Differences between design users and non-design users

Regarding gross revenue performances, companies that employ design perform significantly better than non-design using companies irrespective of size. There are no statistically significant differences pertaining to the export share of turnover and the employment development.

If companies are broadly categorised as either production companies or commerce/service companies then production companies that employ design apparently perform far better than average. On the whole, design users tend to perform better than non-design users in terms of gross revenue, export share of turnover and employment. However, the differences identified by this survey in these cases are not statistically significant.

The economic benefit of design – for companies and society as a whole

The investments and benefits on a company level

There is a marked tendency towards higher growth rates in gross revenues in companies that employ design. The average investment in external design procurement is DKK 600,000 and the average investment in design professional staff lies between DKK 840,000 and 1,250,000. Providing these figures have been constant over the last 5 years, the economic benefits can be calculated as follows:

- External design procurement: investments of 5 times DKK 600,000 = DKK 3 million and an extra gross revenue increase of approx. DKK 4 million over 5 years. The investment is more than beneficial.
- Internal purchase only: Investments of 5 times DKK 840,000 – 1,250,000 = DKK 4.2 – 6.25 million plus a DKK 5 million increase in gross revenue over 5 years. The investment breaks even.

- **Both internal and external design purchase:** Investment of 5 times DKK 840,000-1,250,000 = DKK 4.2 – 6.25 million plus 5 times DKK 600,000 = DKK 3 million. In total: DKK 7.2-9.25 million and an extra increase in gross revenue of over DKK 25 million over 5 years. The investment yields a several-fold turnover.

The investment and economical benefit – on a national level.

On the basis of this analysis, the total additional growth in gross revenue of all design purchasing Danish companies can be calculated from the first to the fifth financial year studied. This is done by multiplying the average gross revenue performance of each design profile group over a 5-year period with the total number of companies in the group.

Table 6.14 Increased gross revenue performance of design users on a company and national level

Design user profile	Gross revenue performance (recent 5 financial years in DKK 1,000)	Difference in relation to non-design users	Number of companies in Denmark with 10+ employees	Total increase in relation to non-users (DKK million)
Do not purchase design	DKK 4,028		9,433	
Purchase design externally	DKK 8,104	DKK 4,075	7,099	28,9
Purchase design internally	DKK 9,089	DKK 5,060	756	3,8
Purchase design internally and externally	DKK 25,888	DKK 21,859	1,180	25,8
Total	DKK 47,109	DKK 30,994	18,468	58,8

The result is that companies that use design have in the fifth financial year of the survey generated an overall additional increase in gross revenue (cf. table above) of approx. DKK 58 billion compared to the gross revenue performance of companies that do not employ design.

The effect of growing design activity

On the account of the aforementioned, we can conclude that there is, in fact, a correlation between investment in design and economic growth for companies that purchase design. If we focus on the effect of rising design activity, we may on the basis of the given data infer the following:

The average increase in gross revenue of approx. DKK 9 billion¹² over 5 financial years for all companies in the modified survey segment is increased by DKK 3.5 million¹³ when the given level of design activity is increased. If the level is decreased, or simply maintained, the gross revenue growth rates will decrease almost at the same rate, i.e. DKK 2.6 billion.

With the current level of design activity in mind, there should be scope for companies in general that do not employ design to achieve growth rates in gross revenue levels that corresponds to the difference between design using companies and non-users, provided they can be coaxed to intensify their design activities.

The mentioned effect is measured on the basis of different gross revenue performances over a 5-year period. The increased bottom-line effect of design investments will, logically, take several years to materialise.

¹² See tables 6.1 and 6.2. (see Danish version)

¹³ See table 6.3.

7 The survey in a design-ladder perspective

This chapter examines the surveyed companies in relation to the design ladder, which identifies the different levels in which companies adopt design. The Danish Design Centre has developed the design ladder.

The design ladder

Step No. 1: Design is an inconspicuous part of, for instance, product development and performed by members of staff, who are not design professionals. Design solutions are based on the perception of functionality and aesthetics shared by the people involved. The points of view of end-users play very little or no part at all.

Step No. 2 Design as styling. Design is perceived as a final aesthetic finish of a product. In some cases, professional designers may perform the task, but generally other professions are involved.

Step No. 3 Design as process: Design is not a finite part of a process but a work method adopted very early in product development. The design solution is adapted to the task and focused on the end-user and requires a multidisciplinary approach, e.g. involving process technicians, material technologists, marketing and organisational people.

Step No. 4 Design as innovation: The designer collaborates with the owner/management in adopting an innovative approach to all – or substantial parts – of the business foundation. The design process combined with the company vision and future role in the value chain are important elements.

Table 7.1 The placing of the companies on the design ladder

	Number of companies	Share in %	Share in % in 2003 ¹⁴
Step 4 Design as innovator	150	15%	20%
Step 3 Design as process	352	35%	27%
Step 2 Design as styling	134	13%	13%
Step 1 Non-design	362	36%	39%
Total	998	100%	100%

Regarding step 1 and 2, the surveyed companies currently distribute themselves on the design ladder in much the same way as the 2001. However, the current survey identifies a much greater representation on step 3 and 4. Since the current survey is wider based, it must be assumed that this distribution represents a more accurate

¹⁴ From *Effekt- og nulpunktsmåling for DDC*, January 2002. (Using a slightly different interview method).

picture, irrespective of the fact that the current segment of companies deviates slightly from the first survey.

Table 7.2 The placing of the company on the design ladder according to size

	10-19 staff		20-49 staff		50-100 staff		100+ staff		Total	
	Num.	%	Num.	%	Num.	%	Num.	%	Num.	%
Step 4 Design as innovator	58	12.4	50	15.2	23	20.9	18	20.0	149	14.9
Step 3 Design as process	156	33.4	116	35.2	38	34.5	42	46.7	352	35.3
Step 2 Design as styling	49	10.5	54	16.4	19	17.3	12	13.3	134	13.4
Step 1 Non-design	204	43.7	110	33.3	30	27.3	18	20.0	362	36.3
Total	467	100	330	100	110	100	90	100	997	100

It is in general apparent that the larger the company is, the higher it scores on the design ladder. The difference is statistically significant. This result is hardly surprising and suggests that the relevance of design is enhanced with the size of the enterprise and the subsequent business requirements and opportunities afforded to large companies. Large companies also have a greater capacity to engage in design compared to smaller companies.

Table 7.3 The placing of companies on the design ladder according to trade

	Production		Commerce and service		Total	
	Number	%	Number	%	Number	%
Step 4 Design as innovation	55	17.4	95	13.9	150	15.0
Step 3 Design as process	119	37.7	233	34.2	352	35.3
Step 2 Design as styling	41	13.0	93	13.6	134	13.4
Step 1 Non-design	101	32.0	261	38.3	362	36.3
Total	316	100	682	100	998	100

A broad categorisation of companies as either production companies or commerce/service companies generally points to production companies as being placed higher on the design ladder than commerce and service companies.

The placing of companies on the design ladder in relation to their investment in design

Table 7.4 Placing on the design ladder in relation to investment in design

	Number of companies	Average investment
Step 4 Design as innovation	74	DKK 431,434
Step 3 Design as process	150	DKK 821,696
Step 2 Design as styling	72	DKK 96,717
Step 1 Non-design	197	DKK 285,987
Total	494	DKK 443,268

There are no statistically significant differences regarding the different levels in the total investment in design¹⁵. It seems remarkable that companies, which otherwise define themselves as first-step companies, invest quite heavily in design all the same. This may be explained by investments in web and other communications design.

¹⁵ The companies are allocated on the ladder according to their reported investment in the external procurement of design and the number of professional designers they have employed (based on monthly salary of DKK 31,975).

Table 7.5 The placing of the companies on the design ladder in relation to gross revenue performance

	Gross revenue performance (recent 5 financial years in DKK 1,000)	Number
Step 4 Design as innovation	DKK 13,272	125
Step 3 Design as process	DKK 12,103	281
Step 2 Design as styling	DKK 5,427	111
Step 1 Non-design	DKK 5,314	308
Total	DKK 8,848	825

Companies on step 3 and 4 perform better than companies on step 1 and 2. The figures are not statistically significant, yet they mirror the general results of the survey that indicate a correlation between a systematic approach to design and high economic performance. Thus, the general tendency reflected by the survey is very likely to be accurate.

Table 7.6 The placing of companies on the design ladder in relation to export

	Export in % of turnover	
	Average	Number
Step 4 Design as innovation	26.34%	131
Step 3 Design as process	22.67%	330
Step 2 Design as styling	16.48%	125
Step 1 Non-design	12.21%	342
Total	18.5%	927

There are marked differences regarding exports according to the step on the design ladder. The export share of turnover is considerably larger in companies on the highest level than for those companies that do not employ design – and the share rises progressively according to the design-ladder level. The difference between group 1 and 2 seen as a whole and group 3 and 4 are statistically significant.

The table clearly identifies a correlation between a relatively large export share of turnover and a comprehensive approach to design. The difference between group 3 and 4 and group 1 and 2 is not statistically significant, but the trend is there.

Table 7.7 The placing of companies on the design ladder in relation to employment

	Employment development over 5 years	
	Average increase in staff	Number of companies
Step 4 Design as innovation	22.9	139
Step 3 Design as process	20.8	315
Step 2 Design as styling	19.6	123
Step 1 Non-design	14.5	323
Total	18.5	899

The general trend towards beneficial correlation between design and company performance also applies to employment, i.e. that the more design intensive the company approach is, the greater the increase in employment. However, the figures are not statistically significant.

Summary – company placement on the design ladder

The survey indicates a general tendency towards correlation between high performance and high placing on the design ladder. The export share of turnover is, however, marked higher.

8 Conclusion and future perspective

The key figures of the survey are:

- Design purchase behaviour:
 - 48.9% of all Danish companies with a minimum of 10 employees purchase design
 - 38.5% purchase design externally
 - 4.1% purchase design internally in the form of professional designer staff
 - 6.4% purchase design both internally and externally

- Design investment on a national level:
 - The total internal investment in design for companies with a minimum of 10 employees is approx. DKK 1.6 – 2.4 billion annually
 - The external annual investment in design for companies with a minimum of 10 employees is approx. DKK 5 billion
 - The total annual investment in design for companies with a minimum of 10 employees is approx. DKK 6.6 – 7.4 billion¹⁶

- The increase in gross revenue in relation to the design purchase behaviour of companies over the 5 financial years studied is:
 - Non-design purchase: DKK 4.0 million
 - External design procurement: DKK 8.1 million
 - Internal design purchase: DKK 9.1 million
 - Internal and external design purchase: DKK 25.9 million
 - General average: DKK 8.5 million.

- The average gross revenue increase for companies where performance figures are available (increasing, constant or decreasing) over the 5-year financial period is DKK 9 million. Those experiencing an increase in design achieve a further increase in gross revenue of DKK 3 million. Where the use of design decreases, the increase in revenue is relatively smaller (DKK 2.6 million on average).

- The largest increase in export share of turnover is achieved where a systematic approach to design has been adopted, namely companies that employ professional designers and purchase design externally. The increase in exports is twice the size in companies that employ designers and purchase design

¹⁶ In comparison, the 1992-98 annual design industry turnover (cf. Dansk design - en erhvervsøkonomisk redegørelse (EBST marts 2003)) increased from DKK 428 million to DKK 1,376 million, which equals an annual growth of more than 20 % p.a. or an increase to 3.2 times the size in 1992. Projecting the growth rate up to 2003, the turnover within the design industry would today be DKK 3,686 billion. This accounts for some of the rise in investment in design, but not all.

Much of the growth can probably be attributed to investment in web design. Many companies have invested resources in several generations of web sites (from simple presentation sites to interactive sites). Finally, the figures reflect the fundamental issue of defining the concept of design. Many companies include investments in, e.g. marketing and branding projects.

externally (33.5%) compared to companies that neither employ designers nor purchase design externally (17.6 %).

All findings of the analysis indicate a very clear correlation between the employment of design and the economic success businesses achieve, which in turn benefits society as a whole. The correlation is so marked that it cannot be disregarded or questioned. The correlation is especially marked for companies that adopt a comprehensive approach to design. This correlation also applies to companies that purchase design both internally and externally, i.e. companies that employ professional designers and purchase design services externally. These companies experience an increase in growth that is statistically significant. Their increase in export share of turnover and their apparent increase in gross revenue performance corresponds to the degree at which a comprehensive approach to design is adopted, represented by the two top steps of the four-step design ladder developed by the Danish Design Centre.

However, what can and should be discussed and studied more closely is the nature of this correlation. Probing further into the underlying relation between the use of design and company/business results would be an interesting undertaking. The ideal method to analyse whether design has an individual effect on company output (e.g. performance in DKK 1,000, export share of turnover in percent and development in staff numbers) is to conduct a linear regression analysis. Such an analysis yields a number of parameters that make it possible to isolate the economic effects of design from the effects of other factors, such as company size and the number of staff university graduates, etc. The present data material is inadequate in technical terms to conduct such an analysis. However, it would be relevant and interesting at a later point to conduct such an analysis if more extensive data material – e.g. public register data – were to be provided. This would allow a closer study of the different variables while reducing statistical insecurities.

The analysis does not identify design as the sole contributor to higher revenue. Investment in design very likely presupposes a certain level of economic success due to the high cost of investment. In turn, the revenue generated by the investment allows the company to reinvest in design. Focusing on design probably yields greater competitiveness because it promotes a more professional business approach. This is reflected in the fact that companies with a comprehensive approach to adopting design perform better.

It seems evident that wider employment of design by Danish business will beneficially affect the economy as a whole in addition to contributing positively to the bottom-line of the businesses themselves.