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# Economies of scale and mergers

*A study of Icelandic pension funds*

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# Abstract

The objective of this thesis is to explore economies of scale, mergers and the number of pension funds in the Icelandic system. The analysis was conducted using data based on quantitative and qualitative approaches. The total number of pension funds analyzed was 25, seven through the process of interviewing representatives and a comparison of various pension funds. This study examines the impact of scale on costs and real return, the merger motives and advantages and the opportunity to reduce the number of funds. The analysis will be followed by a comparison between pension funds in Denmark, Norway and Finland. The findings show that economies of scale are achieved by the giants, which are the largest funds, in both cost and real return. Yet, the small funds seem to outperform large and medium sized funds in regard to real returns, which suggests that the small funds use advantages of their external management through larger financial institutions or larger funds. Most of the merger motives were to seek economies of scale and it seems as if the large amalgamated funds would be better able to cope with the changes that could possibly occur in the pension system or in the financial markets. The results also suggest that some funds that merge with another fund and are very cost efficient before the mergers are not only seeking cost benefits but seek other advantages of scale, which are defined in this study. Consolidation among smaller and medium-sized pension funds do increase cost efficiency and a larger size helps the merged fund to meet funding requirements and as well operations requirements. There is no doubt that the Icelandic pension system can be more efficient than it is today. There are many opportunities for further consolidation and it is safe to assume that in order to provide the promised pension benefits and be an efficient unit there is a need, especially, for the small and medium sized funds to merge in the nearest future.

## Acknowledgements

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# 1 Introduction

Pension funds are one of the important cornerstones of the Icelandic society and make an interesting subject for study. The Icelandic pension funds have an interesting history and are constructed as mandatory for the small population of Icelanders with only 340.000 inhabitants, the smallest economy among the OECD countries. Besides, the Icelandic pension funds have been operating under an interesting economic environment and have only experienced 15 years of non-capital controls. The Icelandic pension system is efficient compared to other countries in the world and has many advantages allowing it to provide great pension benefits to future generations. However, it is possible to consider reforms that could strengthen the position of all pension funds. For example, reduction in pension funds has been part of the reform in pension systems abroad. Pension funds have been decreasing in most countries, but this decline has happened at a much slower pace in Iceland.

Seeking economies of scale has been the main motive for the reduction in number of pension funds abroad and to be competitive to other funds (OECD, 2016a). There is great evidence that larger scales outperform smaller units that have better governance on both costs and returns (Dyck & Pomorski, 2011). The operating costs, real returns, governance and management all matter in relation to future pension payments. If these factors are not well-concentrated and carried out in their best performance it can result in poor pension rights for members, especially in funded and defined contribution systems (Ambachtsheer, 2016; Bikker, 2013). Bikker (2013) found out that unnecessary costs might cause a 10-20% difference between paid pensions by the smallest and by the largest pension funds. An even larger difference can occur if the return on investment declines. Using the unused economies of scale with consolidation can be a solution to prevent this from happening, and to provide better pension benefits than before. Yet, it is not always a benefit for pension funds to be relatively large as it can result in diseconomies of scale e.g. presenting poor communication and co-ordination problems as the scale of the fund is too large, leading to a lack of a good information flow. This can result in poor performance (Amadeo, 2017).

## 1.1 The aim of the research

The scope of this thesis is to investigate and analyze the characteristics of economies of scale. The analysis is threefold; first to investigate whether the size of pension funds matters when it comes to costs and performance, and to try to evaluate the economies of scale of distinctive pension funds. Second, to examine previous mergers of pension funds in order to observe whether it is efficient for funds to merge, as well as to investigate whether economies of scale

was observed. The third is to get an international perspective through comparison with three other Nordic countries.

The objective of this study is to evaluate if economies of scale are achieved by the Icelandic pension funds and analyze whether there is an opportunity for Icelandic pension funds to attain economies of scale. This study will also focus on analyzing whether it should be necessary to reduce the number of pension funds in Iceland and if pension funds should undertake mergers in order to strengthen their position. The main purpose if this thesis is though essentially to raise the importance of economies of scale for pension funds. Moreover, the intension is to contribute to the academic discussion on Icelandic pension funds and the results should be viewed and used to see further effects that can be achieved through pension fund mergers. The potential outcome of this study could reveal the importance of using unused economies of scale for some of the Icelandic pension funds.

The choice of this topic is due to the author's previous bachelor thesis about Icelandic pension funds. The research was about foreign investments and risk diversification in Icelandic pension funds since they were working under strict capital controls. The author's interest in pension funds grew a lot during that time and has since continued to grow. At that time, the author had already made a decision to write about pension funds in her upcoming master program. The reason for the interest in pension funds is twofold. First, pensions are an important feature of old age and retirement and one could say that a pension is one of the long-term investments that every individual takes. Therefore, knowledge about pension funds and how they operate is important. Second, pension funds in Iceland have been working under interesting economic conditions for most of their operating time because of capital controls and also in a small economy. The funds are vulnerable if the market goes into difficulties because they invest a lot in the Icelandic market. This can have an effect on the future pension payments for the generations. Therefore, it is important to have efficient funds that have good risk diversification. Many aspects of the Icelandic pension fund system are possible to investigate, the number of pension funds has been up for discussion for a long time in Iceland. Hence, the author investigates whether the size of pension funds really matters and what could be a motivate for mergers, and what would these mergers mean in the long run for the whole Icelandic pension fund system.

## 1.2 Research questions

The research questions that capture the main purpose of the thesis regarding the Icelandic pension system are:

- Does size matter in relation to cost and real return?
- Why have pension funds merged in the past and was it for the purpose of seeking economies of scale? Have these attempts been beneficial?

Additionally,

- Is there a need or opportunity to reduce the number of pension funds?

Economies of scale will therefore be researched on their potential influence on cost and return. Previous mergers of pension funds will be researched on its motives and their potential outcome. The analysis and results will additionally clarify the question regarding the number of funds. The theoretical framework will provide a better understanding of the problem and the research analysis will be developed from that.

## 1.3 Structure

The thesis is structured in the following way. The next chapter is titled Icelandic pension fund system and has the purpose of introducing the reader to relevant background information on the Icelandic pension fund system. In the literature review the following will be presented and defined; Economies of scale, merger motives among previous studies on economies of scale regarding costs and performance in pension funds. Thereafter the methodology of the study is presented, where the research methods are clarified in more detail. After that, the focus is directed to the analysis part where the findings are presented. The thesis ends with a discussion of results by comparing the results with previous studies and providing conclusions by summarizing the relevant outcomes of the study and making further recommendations regarding future research.

## 1.4 Limitations

This thesis will investigate economies of scale and mergers in the Icelandic context. The aspects of the study are limited to the operating costs (OC), which is divided into administrative costs (AC) and investment costs (IC). The other aspects regarding specific underlying costs will not be explored due to the limited scope of the analysis. Moreover, only real return will be analyzed because of the adjustment which has been made on changes in prices due to inflation or other external effects but not the gross return as that would be a different investigation. Many mergers

have occurred during the last two decades; only six different kinds of mergers and their motives will be analyzed due to the scope of this thesis to conduct very extensive research.

# 2 The Icelandic pension fund system

The purpose of this chapter is to provide the reader with relevant background information on the Icelandic pension fund system. Moreover, the chapter describes the short evolution and design of the Icelandic pension system. By doing this, the reader will obtain a clearer picture and overview of the whole development of the pension system and its pillars.

The aim of Icelandic pension funds is presented in law nr. 129/1997 on mandatory pension benefits and pension funds operation. All working people are obliged to ensure their pension rights through pension fund membership from 16 to 70 years of age. Pension funds shall receive premiums from their members and provide pension payments of old-age pension when members have reached their retirement age until death, or because of disability (disability pension) or death (partners- and children pension). Thus, the pension protects the individual and their families from a loss of income due to disability and death. The operations of the pension fund shall be subject to reception, retention and investment of the contributions and payment of pensions. Moreover, pension funds' contributions and other assets shall be pooled with deposits in banks and savings or transferable securities on the basis of risk diversification in accordance with a stated investment strategy (Act no. 129/1997).

## 2.1 A short historical recap of the Icelandic pension system

The history of Icelandic pension funds goes back to 1851, when a law was passed regarding the obligation for state administrators to provide their widows with financial support after they would pass away. Moreover, the law was enacted in 1855 with a provision for pensions for state employees based on old age or health conditions but without their contribution. In 1904 a new law was enacted in terms of which official workers would pay 2% of their salary for old-age allowance or pay 1 and a 1/3 of their salary for stored pension that could be forfeited if the worker died before their time. Later, in 1919, the first actual pension fund was established for state administrators where members paid 5% of their salary to the fund. With this newly established fund previous law on retirement for administrators expired Today, this fund is still in operation but it has been renamed The Pension Fund for State Employees, following a name change in 1943. Another pension fund was founded for teachers in the year 1921 with the aim of providing pensions for their partners and children if they passed away early. In 1938, the retirement funds of Landsbankinn and Útvegsbanka were established along with pension funds for midwives. Five years later, the pension fund for nurses was established. Among the first pension funds in the private sector were the retirement fund for Eimskip, the pension fund for printers, and pension funds for employees of KEA and SÍS. In the year 1946, 15 pension funds

were in operation and a new law on social security was passed. This trend grew rapidly; in the year 1961 there were 41 pension funds operating and in 1965 there were 61 funds operating (Ísleifsson, 2007). In that same year, the first pension fund of technical engineers was established, as a general private pension fund. So far, the funds that were operating were only for state employees, bankers, several trade unions and several companies. It was not until the beginning of 1970 that a higher number of general private pension funds began to operate after agreements were reached on the establishment of pension funds on the basis of overall social participation of the general workers in 1969 (Baldvinsson, 2004). Following this, the number of funds went up to 90 in that same year (Ísleifsson, 2007).

The general agreement was essentially transformed into law when the law of mandatory contribution for all employees was enacted in 1974 (Act no. 9/1974). This was an outcome of the general wage agreement following negotiations between labor unions (social partners) and the state. This was an important change, as employees aged between 16 and 70 years now had the obligation to pay premiums into the pension fund of their respective labor union or occupational group. Employers were obligated to transfer the sum from the employee's required premium and employer's complementary contribution (Guðmundsson, 2000; Ísleifsson, 2007). Act no. 55/1980 states that all employees, employers and self-employed must pay contribution in a pension fund of the relevant labor union or occupational group. At first it was only contributions of daily wage, and later from all salaries.

In the seventies the number of funds increased significantly with the establishment of private pension funds and mandatory participation law and in 1980, 96 active pension funds were operating (Baldvinsson, 2004). Before the law, most public workers in their retirement were in bad financial situations as only a chosen party was obligated to save for their pension (Ísleifsson, 2007).

The pension funds had no supervision up until 1991. The Central Bank of Iceland received the supervisory role that year and was obligated by law to monitor the pension funds. This resulted in pressure on some funds to earn reasonable returns and to gain sustainable financial positions; if they were not able to fulfill these requirements they had to close the fund or merge with other funds (Guðmundsson, 2001). But today the Internal Tax Directorate is the supervisor of the mandatory payment of contributions and the Icelandic Financial Supervisory Authority of Iceland (FSA) monitors all these funds regularly.

Nonetheless, during this time, no general law about the pension funds was in force. Yet, the Icelandic pension fund system had been evolving over the past decades and there was much

discussion on the essential of a reduction in the number of funds and on the need for a comprehensive law on the matters of pension funds (Ísleifsson, 2013). It was not until 1997 that general law was passed on mandatory pensions and the operation of pension funds. By then the pension funds had become the largest investors in the Icelandic financial markets, and it had become increasingly important that the pension funds had clear and synchronized rules. This gave the pension fund clearly defined limits and a general framework within which to enforce their operations. Moreover, the general pension reform legislation of 1998 on penetration of voluntary individual pension savings was enacted which created the third pillar in the pension system according to the World Bank's benchmark (Baldvinsson, 2004; Ísleifsson, 2013). This opened a new chapter in the history of the pension system in Iceland.

The Icelandic pension system has evolved over time to include all working individuals and has become relatively strong in terms of assets. The system is sustainable and doesn't need to rely on anyone but themselves. The parties that have been influential in shaping the system are the social partners and the state. These significant changes and development that are mention above have shaped the pension system to what it is today, but still the system continues to develop and improve (Ísleifsson, 2013).

## 2.2 Built upon the three pillars

The World Bank has proposed that the pension fund systems should be built on three pillars (World Bank, 1994):

- Pillar 1: Public pensions with mandatory, funded by taxes
- Pillar 2: Private pensions with mandatory, fully funded
- Pillar 3: Voluntary occupational or individual pension savings, fully funded

These are the systems that are the most commonly used and these foundations are consistent with the Icelandic context. The Icelandic pension system is based on the three pillars as described here after.

**Pillar 1:** The social security system in Iceland. The State Social Security Institution ensures that people with limited or no rights to a pension from an occupational fund receive basic social insurance. In summary, this serves as a safety net or poverty relief for individuals with low or no other income from pension funds. It is fully financed by taxes, on a pay-as-you-go (PAYG) basis with both a social security tax imposed on all employers, and general taxation. It was first implemented with the passing of Act no. 26/1936 on public insurance and is intended to ensure that pensioners have minimum old-age pension rights and also a supplementary as other

incomes for low-income individuals where both are paid from the age of 67 (Jonasdottir, 2007). The system also provides a disability pension, illness, maternity and survivors pension (Gudmundsson, 2001). Yet, individuals must have lived in the country for at least 40 years in order to enjoy full benefits. The core benefit consists of basic pension that is estimated at about 10% of the average income of unskilled workers, or a minimum pension of specific amount and an income supplement. All pension categories are means-tested; thus resulting in a reduction after a certain income threshold (Herbertsson, 2006; Ísleifsson, 2013). The full basic pension value per year for an individual without any kind of income is roughly the same as the minimum wage level (Jonasdottir, 2007). The weight of the social security system has been declining in the payment of old-age pensions in the last decade, this is due to rising pension contributions on pensions funds and increased means-tested income to pension payments.

**Pillar 2:** Mandatory funded occupational pension funds are the dominant feature of the Icelandic pension system and have existed since 1919. It wasn't until 1969 that occupational pension funds where made available to the general public. This pillar is based on fund accumulation rather than on a PAYG mechanism. The advantage is that each generation saves for its old age and thus transfers consumption over time and does not impose pension burdens on the next generation (Ísleifsson, 2013). However, the disadvantage is that it takes a long time, many decades even, to build up funds that pay good pensions. Mutual insurance is one of the foundations of this pillar and contains that all of the members in each fund ensure each other a lifelong pension from retirement age. This means that those members who die young get less pension from the fund than they paid into it, but as a result it becomes possible to pay the pension of the members that live a long time (Almenni lífeyrissjóðinn [AL], 2017a).

Funds in this pillar are divided into two sectors because their pension rights are different. First are the general labor market occupational pension funds (private sector), based on collective defined contribution (DC) and second are the state labor market occupational pension funds (public sector), based on defined benefits (DB) (Ísleifsson, 2013).

*Private sector:* The pension rights are called fixed premiums and depend on the rights of each position of the fund at any given time and the premiums that are paid to the funds. As mention, based on DC thus have no employer guarantee. The pension rights are reliant on real returns, life expectancy and the prevalence of disability (ASÍ, 2010). Thus, the investment risk is dispersed by the members as pension rights are regulated by the financial position of the fund in every period. As presented in the general pension law, it is mandatory for all wage earners from 16 to 70 years old to pay a premium at a minimum of 12% of total salary. This is divided

between an 8% contribution from the employer and 4% from the employee (Act no. 129/1997). In 1997 the premium was a total of 10%, divided into 6% from the employer and 4% from the employee but in 2006 the premium was raised to meet a growing pension burden due to increased incidence of disability and a prolonging life expectancy for the population (Baldvinsson, 2017). Certain pension funds require higher contribution from employers e.g. airline pilots have 16% and bank employees have 14.4%. Last year in 2016, an agreement was made about increasing the contribution from the employer by 3.5% in three stages until 2018, thus becoming 11.5%. This would only apply to a majority of those funds operating under the collective agreement of the Icelandic Federation of Labor (ASÍ) and the Confederation of Employers (SA) (SA, 2016). The newest increase of premiums is reasoned to be an equalization of pension rights for all Icelanders (Baldvinsson, 2017).

*Public sector:* The pension rights are DC, which means that members are promised certain rights on the basis of the determined premium with the employer guarantee by the government and municipalities. The membership to these pension funds depends on which union membership they are in; thus if public employees have membership to some unions of the general labor market then they have membership to those private pension funds. Yet, pension premiums remain the same for every public employee and are not dependent on their union even if they contribute to a private pension fund. But, those public employees who chose to join a union of the general labor market would then lose the employer guarantee. The pension premiums are better than in the private sector, as the employer contributes 11.5% and the employee 4%, together 15.5%. But since last year 2016, the private sector made an agreement to increase their employer contribution to match the public sector contributions; as mentioned previously, this is a positive step in the direction of having equal pension rights provided to all Icelanders. The remaining difference between the public and private sector is DB/DC and the employer guarantee that the public sector is based on. If funds in the public sector have actuarial assessment that shows that the contributions do not sufficiently meet their obligations of the fund, then the board will raise the employer contribution in accordance with the results of the actuarial assessment because of promised fixed rights (DC). In this case the employer is the government (state or municipality). Therefore, the pension rights will never be reduced even though the financial situation of the funds is not good (ASÍ, 2010).

The minimum guarantee of pension by law based on 40 years of periods of premiums shall include at minimum 56% of the average salary from the professional career to monthly pension from 70 years old until death. This implies that members earn the right to 1.4% of their salaries per year on average, compared to 40 years of premiums. If pension funds are unable to provide

the minimum guarantee of pension, a guardian from the FSA will take over the fund and dismiss the board and director of the fund for some time. The pension rights are indexed and change monthly in line with the consumer price index. In some funds the rights are linked to the wage index (Act no. 129/1997). The minimum pension rights in the private sector are 1.4%, and 1.9% in the public sector. The amount that each individual pension member earns is equivalent to 56% to 75% of the salaries paid by premiums to the pension fund. This does apply to an individual that have paid premiums of 10% and 12% for 40 years and receive pension payments at the age of 67. Notably, the rights can vary between funds (Baldvinsson, 2004). In 2016-2018 the increased premium for those funds operating under the collective agreement according to member of ASÍ and SA should, in the long run, provide better pension rights than those existing before. In the near future there is a possibility that the minimum contribution will be increased by law to this amount as the social partners press the government to ensure that every working Icelander will pay the same premium. An example of this is the pension rights for those who will pay a premium of 15.5% in 40 years increase about 29%, 19% for 30 years, 13% for 20 years and 6% for those who pay for 10 years. This is calculated as having 3.5% real return and unchanged life expectancy (Baldvinsson, 2017). Baldvinsson (2017) implies that what matters about the final rate pension is the development of the wages through the employees' working lives. Moreover, if the wage development will continues as it has for the past years the pension can be from 66% to 90% of the salaries paid off by premiums to the pension fund. If calculated as a 1.5% increase in wages per year, the pension can be 58% of the salaries in 40 years time. He reasons that it's recommending that individuals aims at pension equivalent to 60% to 80% of the final salaries.

Some funds provide a part of the minimum contribution to private heritable pension and the other part to mutual insurance. To give an example, members in Almenni Pension fund have 4% of 12% contribution paid to this private heritable pension then 8% are used to provide the guaranteed minimum of pension. In some funds it is possible to choose between this way or another way which involves having the minimum guarantee of pension paid off to first years of the retirement from the private pension and then the mutual insurance will take over and pay the until death. This means that if the pension member passes away at age 70, then their private pension will be inherited by their spouse or children, and the pension member will be able to withdraw their private pension whenever they want after reaching 60 years of age (Baldvinsson, 2004; AL, 2017a).

The pension is paid out monthly with equal payments. The premiums for mandatory pension rights are exempt from tax. Pension payed out however, is taxable in the recipient as other

income. At age 67, members can withdraw old-age pension, as a rule, but it is also possible to withdraw the old-age pension earlier or later, with resulting reduced benefit or additional benefit (Jonasdottir, 2007).

**Pillar 3:** Voluntary individual pension savings with tax incentives was a part of the general pension reform in 1998, and the laws passed with it. The premiums are not taxed when paid into the pension fund or another pension depository that members choose, but when paid out then the pension payments are taxed by the income tax as regular earnings. From January 1st 1999, employees and self-employees could at a maximum, subtract 4% of total salaries as additional contribution to pension fund or another pension depository that they choose. This is an extremely good choice when saving for old-age because in many collective agreements between the employer and employees today, it has been agreed that employers pay up to 2% contribution for 2-4% contribution from the employees (Baldvinsson, 2004). This pillar is mainly based on a DC of individual accounts and the pension savings are available to draw this additional pension at the age of 60. This pension will be inherited if the individual dies before the funds are fully paid out (Jonasdottir, 2007).

To sum up with a short overview of the system, if the individual hasn't paid any premium or else very few premiums to pension funds, then pillar one will provide him the sufficient pension that is needed. For an individual who has paid into a pension fund all his working life – for at least 40 years – he will receive a minimum of 56% of his average salaries. If the increased minimum contribution will be passed and enact as a law, then all pension members will be able to receive an extra 29%, thus a total of 85%. Yet, this outcome is not guaranteed; it all depends on the total expectancy, returns on investments and so on. Therefore, it is important for individuals to have voluntary pension saving in order to increase their pensions in old-age and, especially if the individual doesn't have any other savings, this could bring more financial security as the pensions can be not nearly close to their previous salaries.

## 2.3 Actuarial pension fund assessment

As mentioned above the general labor market pension funds are based on DC and pension rights are regulated by the financial position of the fund in every period. Pension funds have the responsibility to promise a fixed pension payment over an unfixed time period. In simple terms, the actuarial assessment calculates the total assets minus the total liabilities to work out their total position and ability to pay pensions (Baldvinsson, 2004).

Every board of pension funds is obligated to do an actuarial assessment each year involving a comparison of the pension total assets and its liabilities to pay pensions. An actuary or another person with permission from the FSA are the only ones that can make actuarial assessments for pension funds (Act no. 129/1997). This can be in particular the solvency of a pension fund that is dependent on uncertainty and the concept is related to perspective of risk management as the funds ability to meet its obligations. A pension fund's financial position is largely influenced by demographic factors that have an effect on the payments and time are determined by factors such as life expectancy, disability incidence and whether spouses or children are eligible for pension benefits after a member's death. In the assessment a real return of 3.5% is used and life- and disability odds and statistics about family status (Ísleifsson, 2013).

The main purpose is to guarantee a balance in the fund's assets and liabilities. The results of the actuarial assessment are usually expressed as a percentage of total liabilities. This percentage is estimated by taking into account the existing assets and the future contributions of fund members that is total assets against accrued liabilities and future liabilities that is total liabilities. Thus, the estimate involves calculating on one hand the accrued liabilities based on the acquired rights of members, and on the other hand, the total liabilities compared to active members who continue to pay into the fund until they become eligible for pension. Pension funds without an employer guarantee will have to gain their pension benefits entirely on premium payments and the investment returns earned on those premiums. Notably, Iceland has adopted some of the Danish actuarial standards and practices (Ísleifsson, 2013).

Table 1 summarizes the main factors that are used to calculate the actuarial position. In essence actuarial assessment plays a major role in the pension funds where it really sets a goal for the funds to achieve on average 3.5% real return. Thus, the method fundamentally requires that the assets of the funds yield a 3.5% real return annually.

**Table 1:** Actuarial position calculation. Source: Baldvinsson.

| | | | | |
|---|---|---|---|---|
| Current assets | - | Accrued liabilities | = | Earned position |
| + | | + | | + |
| Future pension contribution | - | Future liabilities | = | Future position |
| = | | = | | = |
| Total assets | - | Total liabilities | = | Total position |

This 3.5% rate was chosen with regard to the actuarial position of the fund, at the time of the agreement, with the goal of it being high enough for the majority of the funds to be solvent. At the same time, the figure needed to be a lower benchmark to a number that had a realistic chance of achieving such returns in the long run. This implies that pension funds have required minimum returns to achieve and have to build their investment strategy with this benchmark in mind (Ísleifsson, 2013).

The law entails for the actuarial assessment that if the position of pension funds are in excess of +/- 10% or +/- 5% for a period of five consecutive years, should therefore, correct the position of the fund by lowering or raising the pension rights according to the pension funds law. This is done in order to fix the pension payments or rights to the funds position and ensure that the assets do not move between generations, pensioners and paying members (Act no. 129/1997).

The actuarial position of all pension funds in Iceland in the year 2015 was -11.5%[1]. Only 13 of 26 funds had positive position and the biggest fund, the Pension Fund of Commerce, had the highest percentage 8.6%. The funds that have the most negative percentage were the ones with employer guarantee, as the assessment was -38% compared to funds that are without the employer guarantee, at 3.2%. This is, however, better than the year before as the actuarial position of all pension funds was -13%. Yet, funds with the employer guarantee had the same assessment in the year before but the funds without employer guarantee had lower percentage, at 0.1%. After 2008, when the bank crash crisis occurred, their actuarial position has been getting better each year by an average of 1.33% for the last seven years (The Financial Supervisory Authority [FSA], n.d.).

## 2.4 The number of pension funds over the years

The Pension Act of 1997 entails that every pension fund requires approval of operation from the Ministry of Finance. At that time, all 66 pension funds had to apply for license to the Ministry of Finance before July 1st 1999. There are certain restrictions that are held in order to receive approval and become a legal pension fund with mandatory contribution. The restrictions are that they have to be able to offer lifelong annuity after retirement, a disability pension, death pensions i.e. spouse's and children's pensions, and have at least 800 contributing fund members among other requirements. This does not apply to pension funds that have employer guarantee (Act no. 129/1997).

[1] See actuarial position of all pension funds in 2015 in Appendicies, Appendix 1.

The history as introduced in chapter 2.1 showed that the number of funds increased quickly; 1946 there were only 15 funds operating and 15 years later the number had increased to 41 funds. In 1970, soon after the new agreement about mandatory and fully-funded occupational pension funds, the number of funds increased to 90 funds in that same year, and reached a peak at 96 funds in 1980. By then, funds were available for nearly every occupation, and were linked to each trade union, company and bank etc. (Guðmundsson, 2000).

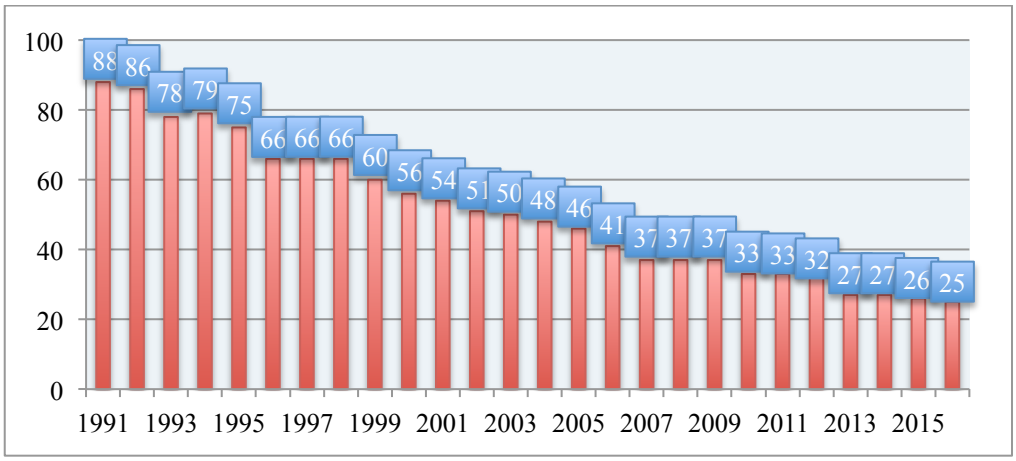


**Figure 1:** Number of pension funds in Iceland, 1991 – 2016. Source: FSA and Herbertsson.

In Figure 1, the number of pension funds in Iceland from 1991-2016 is presented. One can see over the past 25 years a huge decrease in the number of pension funds. This trend has been caused both by funds merging, and by funds that have ceased to collect contributions, being unable to fulfill their requirements and thus being closed by the Pension Act of 1997. Moreover, in 1999 every pension fund had to apply for license if they wanted to continue to be an active pension fund.

In 1999 there were 13 funds that had ceased to collect contributions and the total number of funds decreased over the years until in 2016 there were only 25 funds left, compared with 88 in 1991. The biggest reduction in pension funds happened among those without employer guarantee; there were 42 in 1994 and 22 in 2007 but with employer guarantee they were 19 in 1997 and 13 in 2007. In 2015, six funds did not collect contributions, 18 funds were without employer guarantee and 7 with employer guarantee from the government or municipalities (FSA, n.d.; Guðmundur, 2000). Guðmundsson (2001) implies that the mergers of the pension funds aimed to improve efficiency. Pension funds have reduced by an average of 2.5 per year during the period between 1991 and 2016, the overall decrease in the number of pension funds was 71,6%.

Over the years there has been considerable criticism of the high number of pension funds and high voices of reasons to reduce the number to pursue economies of scale such as reducing the OC and diversify the risk (FSA, 2014). Furthermore, the OECD (1999) argues that even if all small funds would merge Iceland would still have up to 25 pension funds remaining, which is rather high for a country with less than 300.000 habitants at that time. Yet, they implied that merging is not always easy and thus changing the required minimum size of pension funds from 800 to 2000 contributing members instead would reduce the number of funds and could provide scope for reducing pension fund OC. Moreover, the National Association of Icelandic Pension Funds (Landssamtök lífeyrissjóða) (2005) published a strategic vision about the Icelandic pension system. Implying that evidence show further developments on consolidation between funds and after few years only 10 to 15 funds will be operating. Despite this, 11 years later the required minimum contributing member size is still 800 and Iceland still has 25 pension funds. Yet, the number of pension funds has decreased over the years at a slow and steady pace.

As mentioned previously, the FSA monitors every pension fund and collects funds data into their database. Every year they announce and publish annual accounts of all the Icelandic pension funds. Thus, as shown in Appendix 2, the author gathered information about all of the pension funds operating at the end of 2015 regarding active and non-active members, total assets and market share. Also, important to keep in mind when looking at the table is that it is common for members to have pension rights and receive a pension from more than one fund. This is possible because, when someone changes their job, there is a possibility that the employer has a collective agreement with a special Union and therefore a special pension fund. Moreover, the table shows that there are huge differences between the first funds and the last ones. Thus, the size distribution is very uneven as the largest three funds own the market share by 49.51% and the remaining 23 pensions fund the other half. At first glance, this shows some sign of potential mergers and unused economies of scale. The author has divided the funds into three color differentiation sections, and will discuss the differentiation in the following paragraph.

The red section shows the largest funds, the ones that have very high numbers of active and non-active members, with their total assets reaching over 100 million ISK. Yet, there are quite large differences between the first three funds and the remaining ones, both in market share and members. The highest market share that one funds has is close to 18% and the lowest is 3.5%, but the red section owns 86,32% of the market calculated in assets. Notably, in December 2016 two pension funds merged to form the Birta Pension Fund. The two are shown in the table, no. 7 & 8, and they are marked with a bold line enclosing them. Unfortunately, there is not enough

data to change them to Birta Pension fund in the table since the FSA has not published the annual account of 2016. The green section shows pension funds that have only a few members and much lower assets than the red section. This demonstrates the funds that have no more than 8.37% of the marker share combined. Notably, they have more than 800 active members, which was mentioned as one of the restrictions in order to gain approval to become a pension fund. In addition, all of them are without employer guarantee. The blue section shows the pension funds that have hardly any members and owning only 5.32% of the total assets. They do not meet the requirement for 800 active members, but six out of nine of them have the employer guarantee. Thus, the requirement does not apply to them (to pension funds that have employer guarantee. Besides, there are six funds (five with the employer guarantee) that are closed, do not take any new members but still defined as an operating fund. Most of the funds closed in 1998 when Brú Pension Fund was established for pension funds of municipalities, yet, not all decided to merge with the new fund and remained the same but had to close for new members (FSA, n.d.)

## 2.5 Development of the net asset of pension funds

Figure 2 demonstrates the development of the net assets and in percentage in gross domestic product (GDP).

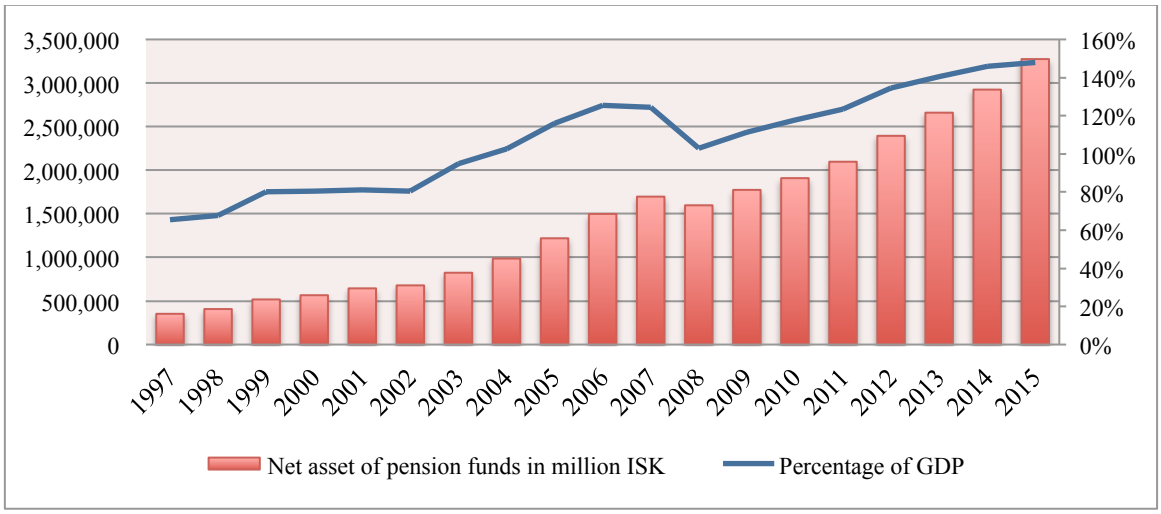


**Figure 2:** Development of the net asset of pension funds and as a percentage of GDP, 1997 – 2015. Source: FSA and Statistics Iceland.

The growth of the pension funds has increased significantly. When looked at the development of the net assets of the entire system, one can observe that they have grown from being 352 million ISK in 1997 to 3,275 billion ISK in 2015. Remarkably, this implies about 10 million ISK per Icelander. In 2008 the asset had decreased about 100 million ISK in response to the economic crisis but since then the assets have increased each year. Relative to GDP, the funds have increased significantly faster than the economy. In the year 1997, the net asset of pension

funds of the GDP was about 65% and has risen rather gradually and reached the top before the downturn in 2006 at 124%. Two years later it was 103%, increasing steadily to 148% in 2015.

Notably, in 1970, the net assets of pension funds were 17% of the GDP in Iceland. This shows high increase in assets over the decades and only keeps growing. This has happened as well in other European countries as the ratio of assets to GDP went from being 20:40% to 70:90%, and even beyond 100% in some countries, namely, Holland and Switzerland (Guðmundsson, 2000; OECD, 2013).

## 2.6 Investment policy

Pension fund managers and investment advisors are concerned with the issue of making an investment strategy that is beneficial and adds surplus to the funds. There is a great concentration to avert the scenario that the obligation of pension payments will exceed the investment portfolio. Because the purpose of the investment portfolio is to fund those required pension payments (Leibowitz, Baber, & Kogelman, 1992). Risk management is used to understand and decide whether the risks are acceptable, and if not, what action should be taken. For the risk to be managed and carefully followed at all times, a risk management policy is constructed, advising how to define and identify the risk, measure the risk, and specify the risk limits, etc. (Hull, 2015). Therefore, one can say that the choice of the investment product is a vital decision and should be monitored at all times.

Pension fund investment policy is a long-term investment strategic plan that is reviewed annually. The investment strategy entails the relative weight of each asset class defined and flexibility is added into the policy with permits for a limited deviation from the policy. The general objective of the pension fund is to invest premiums for the members, in an efficient manner, as well as, taking into account the best terms at any time with respect to risk and return (AL, 2016a).

Due to the capital controls, many pension funds have not achieved their strategy regarding foreign assets and risk diversification. The legal basis for the investment policy in each fund can be found in Act no. 129/1997 as it entails limitations of investments in singular asset classes and all of the pension fund must follow and have this in mind when creating the investment strategy, which can be found in Appendix 3. Restrictions on mutual insurance funds are more than on private pension plans that are not connected to mutual insurance.

### 2.6.1 Capital controls

The history of the capital controls in Iceland goes way back to 1931, when Iceland had to impose a capital controls because of the effects of the great depression in the US. These controls were not liberalized until 1993, when Iceland decided to be a part of the European Economic Area (EEA). This was the first year in which the pension fund was able to invest in foreign markets. In the beginning they invested small amounts but later on the pension funds considered to invest in a greater extent abroad. Unfortunately, the government was required to impose the capital controls again when Iceland experienced their biggest financial bank crisis when three of Iceland's biggest banks collapsed in the same week due to the economic crisis of 2008 (Daníelsson & Zoega, 2009; Iceland Chamber of Commerce, 2011). The main goal of imposing the capital controls was to prevent an excessive outflow of capital, with restrictions on the flow between countries, thus promoting stability for the Icelandic krona and reducing the risk of abnormal depreciation that can have bad effects on the economy as whole (Central Bank of Iceland, 2009). The pension funds have only been investing abroad for 15 years over their whole period of operating.

In Table 2, one can see the development of the foreign investment ration of funds total assets. The foreign investments were at their highest point in 2006 and again in 2009; at nearly 30%. On average the proportion has been 25% from 2000-2016, which is relatively low compared to the foreign investments of other pension systems around the world.

**Table 2:** Pension funds' foreign investment ratio of total assets. Source: The Central Bank of Iceland.

| Year | 1997 | 2000 | 2003 | 2006 | 2009 | 2012 | 2015 | 2017(Feb) |
|---|---|---|---|---|---|---|---|---|
| **Foreign** | 7.40% | 22.61% | 19.41% | 29.56% | 29.87% | 23.05% | 22.94% | 21.68% |

The capital controls have certainly limited both the risk diversification and investment choices. Most of funds assets are invested in Iceland and funds are now large shareholders in many Icelandic companies. This has resulted difficulties for the large pension funds, as they are unable to move their assets unless making a significant movement in the market. Nine years after the crisis on March 14$^{th}$ 2017 the government and the Central Bank of Iceland made the significant decision to predominantly liberalize the capital controls (Central Bank of Iceland, 2017). This is a great opportunity for the pension fund to finally be able to diversify the risk much more effectively. Up till now there has been major risk as most of the assets are invested in one country, meaning that if there were another financial crisis in Iceland, the pension member may lose not only his job but also his pension (Jónsson & Sigurgeirsson, 2014).

### 2.6.2 Asset allocation

The Act no. 129/1997 about pension funds addresses the limitation of investment in particular asset classes. The law has restrictions on that foreign investments shall not exceed 50% of the net asset ratio. Unlike Iceland other Nordic countries do not have these restrictions on foreign investments (OECD, 2016b).

In Figure 3, one can see historical asset allocations of Icelandic pension funds from 1997 to 2015. To begin with, the pension funds had their most assets in domestic bonds and the bonds are mostly with government guarantees as 80% of their asset and the foreign assets was only 7%. From 1997 and onward one can see a shift in asset allocation; behind this was a change in rules and legislation governing limitations on pension funds investment. Besides, there was a growing awareness among pension funds managers to diversify more into equity and foreign assets to earn a better return and risk diversification (Guðmundsson, 2001).

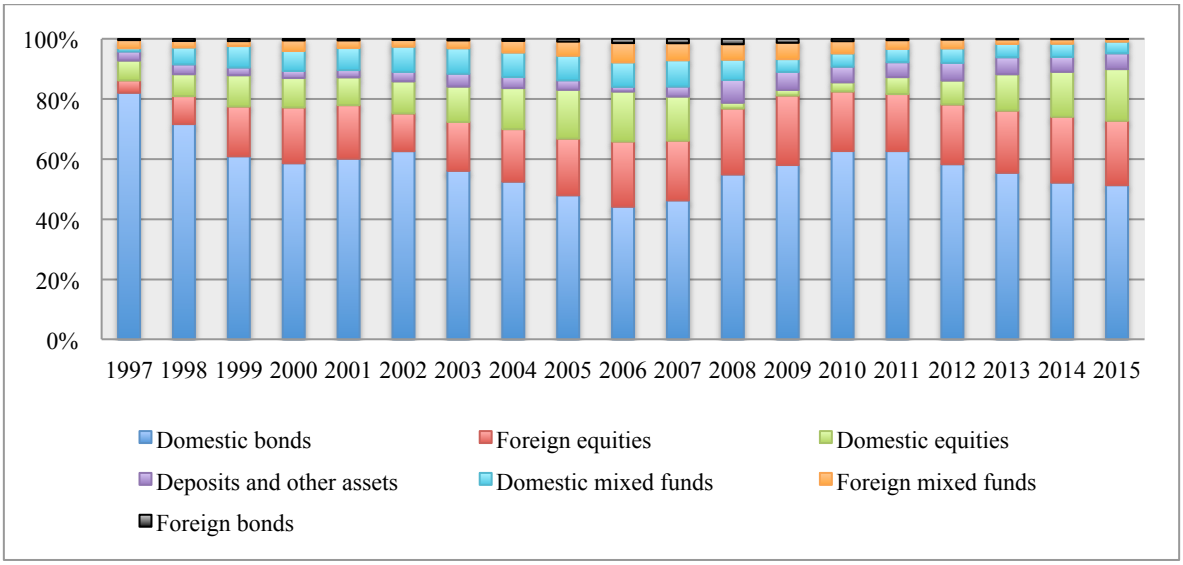


**Figure 3:** Historical asset allocation of Icelandic pension fund from 1997-2015. Source: The Central Bank of Iceland.

The pension funds started to expand their asset allocation with diversification, investing more in foreign assets along with domestic equities. As presented in the above, Figure 3, the economic crisis occurring in 2008 had a heavy impact on the asset allocation. Most of the domestic equities practically vanished and the pension funds started to invest more in deposits. There was an increase in domestic bonds for a couple of years but contrary increased domestic equities which seem to be at the expense of the domestic bonds, foreign mixed funds and foreign bonds.

Capital controls have limited new foreign investments since the economic crisis of 2008; thus, no new foreign investments have been allowed. Yet, pension funds received limited exemption

from the controls to new investments in mid-2015. Foreign equities are lower in all pension fund portfolios due to the capital controls and for the past couple of years, domestic equities have increased in the pension fund portfolio similar to the registration of the Icelandic companies on the stock market. Pension funds are now the owners of approximately half of the listed shares. Moreover, their assets in equities are getting closer as their assets in domestic bonds, which have been the single largest category of assets in majority expect for three years, 2005-2007 when the prosperity was in the highest heights (FSA, 2016).

### 2.6.3 Real return

In Figure 4 the real return from 1997 to 2015 is demonstrated. One can see rather unstable return over the years and has fluctuating characteristics. The performance of the pension funds in 2015 was very strong; the highest real return has been since 2006.

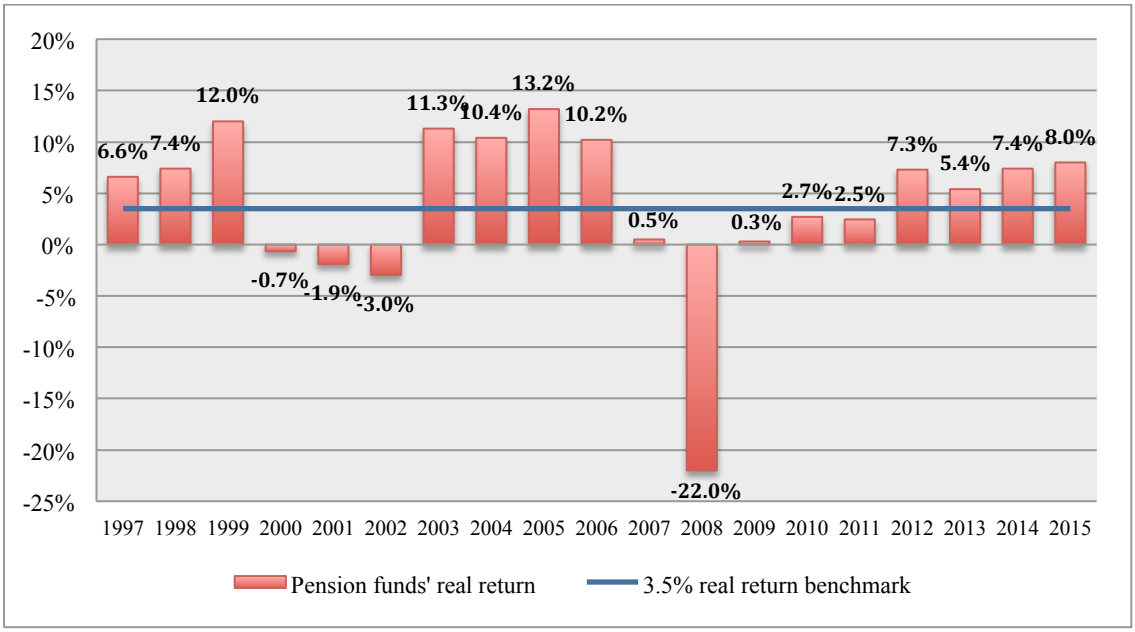


**Figure 4:** Pension funds' real net rate of return from 1997-2015. Source: The Central Bank of Iceland.

It is possible to link both the returns that are negative as a result of economic difficulties that happened in the world at those times. In 2000 one can see -0.7% return and two years later at -3% is somewhat a result of the dot-com boom. Yet, the funds managed to improve pretty quickly as in 2003 their return had significantly increased, reaching 11.3%. Icelanders can connect the year 2003 with the growth of their prosperity. The banks had begun to be privatized and between 2003-2007 the economic growth was on average 6.4% (Statistical Iceland, n.d.). For the next four years the return was strong and had its highest return, 13.2% in 2005, over the whole period of 1997-2015. One can see in 2007, the return is really low compared to the years before, a precursor of the economic crisis that was to occur in 2008 and resulted in the crash of

the three biggest banks in Iceland. The return was historically the lowest point ever on record, at -22%. Nonetheless, some pension funds had small but positive returns, yet the returns were mostly negative and this was due to differences in asset allocations between funds (FSA, 2009). However, the significant downturn was fairly short-lived and one year later they managed to achieve positive percentage. With capital controls imposed the return grew roughly equal to 2011; then, it had a spike in 2012 but has since been stable with good returns. In Figure 4 a benchmark is marked at 3.5% real return: in 11 of the 18 years presented, the returns succeeded in going over the benchmark.

In the years before the economic crisis, several funds had increased the pension rights because of good returns and actuarial position but after the crisis both returns and actuarial position became undesirable and the fund had to decrease the pension rights. Yet, because of the good periods in the years before, some funds held a good standing at the time of the crisis. Thus, the increase in the pension rights before the crisis was needed to be reduced after the crisis and happened to be similar to those increase before, meaning that the funds remained the same as before the increase. If the funds didn't have these goods year before the crisis, the members would have seen higher reductions in the pension rights (Á. Guðmundsson, personal communication, April 4, 2017).

# 3 Literature review

Since the previous chapter proposed an introduction to the evolution of the current Icelandic pension system this chapter serves the purpose of providing the reader with an overview of the existing theory on economies of scale, as well as an overview of prior research regarding mergers and size on costs and real return.

## 3.1 The theory of economies of scale

The theory of economies of scale has existed for a long time and has its origins in the industrial revolution. Stigler (1958) suggest that up to his research the theory had good reasoning but none scientific prosperity. Because it was missing the central concept in the theory, which was firm of optimum size and it had been avoided in measurement. In his study he used the survivor principle to find the optimum size and his results found that there is a fairly wide range of optimum sizes, and that size is an important variable when investigating the relationship between size and other factors in relation to the firm. He implies that the theory of economies of scale in simple terms is the relationship between the scale and the rate of output (Stigler, 1958). Silberston (1972) found that a high scale of output may require a different approach in comparison to low scale because of differentiation in technique at those scales. Besides, with increased size the capital costs do not increase in proportionately with the size but found out that the costs can increase a little.

Perloff (2012) describes economies of scale as prosperity of a cost function whereby the average cost of production falls as output expands. In simple terms, if the firm's average cost falls as output expands, it has economies of scale. If its average cost rises as output expands, there are diseconomies of scale. Thus, when a company expands, the average cost, or the marginal cost, decrease as more units are produced as a result of the increasing size. The long-run average cost curve (LRAC) can have many different shapes. Competitive markets have U-shaped curve while non-competitive markets may have U-shaped or L-shaped curve, or downward sloping or upward sloping. The shape of the average cost curves indicates whether the production process has economies or diseconomies of scale. Let us assume that the LRAC is U-shaped and when firm is experience economies of scale the output and average cost is at its lowest point and the resources are used efficient and the performance is optimal. If an increase in output has no effect on average cost then there are no economies of scale. With the assumed U-shape curve diseconomies of scale happen when the cost function whereby the average cost of production rises when output increases. Meaning that the output and average cost are higher than before, moving to the right and up the U-shaped curve. This entails that economies of scale

can have limits, such as passing the optimum design point where cost per additional unit begin to increase. Furthermore, the short-run average cost curves (SRAC) are not able to obtain the same low average costs as the LRAC. Additionally, even if a small firm operating at minimum average cost, it cannot produce at as low an average cost as the larger firm that is taking advantage of economies of scale (Perloff, 2012).

Advantages of economies of scale do in fact depend on the particular characteristics of an industry but it is possible to apply the advantages to a variety of administrative and business situations and at various levels. But the most common in the long run are the technical economies; invest in technology that's improves the operations, monopsony economies; mass buy purchases, managerial economies; providing specialized staff, financial economies; lower costs and fees, risk-bearing economies from diversification and network economies; as building networks with more people can have great benefits. Some types of diseconomies of scale are poor communication – such as large firms experience because they find it difficult to maintain an effective flow of information between departments, coordination problems, low motivation, resulting in lower productivity and inefficiencies related to the principal-agent problem (Amadeo, 2017).

## 3.2 Activities and motives for pension fund mergers

There are seven theories regarding merger motives introduced by Trautwein (1990). The first one is efficiency theory where mergers are planned and performed to achieve financial, operational and managerial synergies. The second one is monopoly theory where mergers are planned and performed to achieve market power. The third one is valuation theory where mergers are planned and performed by managers that have more information about the value of the other company than the stock market does, thus holding important information about possible benefits to be derived from the other company, and transferred to theirs. The fourth is empire-building theory where mergers are planned and performed by managers who want to maximize their own utility instead of their shareholders' value. Hence, an attempt to increase their own power and influence – this approach is linked to the separation of ownership and control. The fifth is process theory where merger motives come from the strategic decision process. The sixth is raider theory where mergers are planned and performed by wealth transfer. The last is disturbance theory where mergers are caused by economic disturbance, such as changes in individual expectations or economic crisis (Trautwein, 1990).

A few studies have been conducted concerning pension funds and mergers. In Demarco, Rofman & Whitehouse's (1998) research study, it was implied that in the initial years of reform

pension schemes are likely to be unstable and thus M&A may be regular. Evidence from Argentina showed that the first three years of the new regime, seven funds merged, thus becoming 18 funds instead of 25 funds. The reason was their financial shortfalls and results of weakening market share. Yet Engelen (2003) talks about the gain of economies of scale through pension fund mergers. One of the main incentives of consolidation is to minimize the management costs and to obtain economies of scale, which entails greater market power. This is done through pension fund mergers that are followed by rising numbers of funds.

In Barros and Garcia's (2006) research about performance evaluation of pension funds management companies in Portugal, it was implied that mergers are present in the market during their analysis, which indicates a continuous attempt by the pension funds management companies to increase their size. They found out that the pension funds management companies that were involved in mergers tend to be more efficient than other funds not involved in the merger activity. Their result was consistent with those of Cummins, Tennyson, and Weiss (1999), which showed that acquisition targets tend to show larger efficiency gains in the post-acquisition periods in the U.S. life insurance industry. Barros and Garcia (2006) also noted that large pension funds management companies, with more assets, tend to have higher efficiency scores than smaller funds management companies, an effect that is explained by the economies of scale in this particular activity. From their result, it appears that merger activity is of key importance when it comes to scale and efficiency. OECD (2016a) implied that a low number of pension funds might lead to higher returns as larger pension funds are likely to conquer lower OC. Therefore, by merging funds economies of scale will be generated, which may benefit pension members if investment fees charged become lower or the real return of the investments increases.

In Europe the number of funds has declined from the period 2005-2015, especially in Iceland, Denmark, Hungary, Netherlands and the United Kingdom where the decline has been over 44% (OECD, 2016a). OECD (2016a) implies that the decline in the number of pension funds in countries today could be the result of mergers and closures of inefficient funds. Thus, the goal of the merger between pension funds is to achieve economies of scale and perhaps become more competitive with other funds.

In 2012, two of Denmark's pension funds, FSP a labor market fund for the financial sector and AP Pension, which is a much larger pension, began the process of merging (AP Pension, 2017). The reason for the merge was increased market competition, regulatory pressure and capital requirements. FSP had been criticized by having the high costs and by merging FSP would

uphold members' interest. The merger gave them both additional strength in the market and economies of scale (Fixsen, 2012). Yet, Unipension and Forca were unable to consolidate because both parties couldn't successfully negotiate on the terms and were therefore suspended (Horn, 2013). This shows that there isn't always easy to merge, as there are important factors that need to be considered and well though before going into a merger. In 2015, Denmark had 20 pension funds and the number of funds have reduced from 30 funds from the year 2005 (OECD, 2016a).

The Netherlands has one of the largest ratio of pension funds asset to GDP, at about 178% (OECD, 2016a) and the regulators have requested a fewer and larger funds to support good governance structure. The motives for the mergers are not only cost reduction but as new legislation and new governance structure has been initiated. This has encouraged pension funds to merge with larger-sized funds. Small pension funds that have high costs are particularly likely to merge into industry-wide schemes or join an insurer to prevent vulnerable funds that may no longer be able to pay promised pensions after some years. The resulting benefits are cost efficiencies, more investment opportunities, along with improved governance (Preesman, 2015). The Netherlands had 802 pension funds in 2005, and currently had 320 in 2015 (OECD, 2016a). Pension funds in the Netherlands are particularly big and, as a consequence of mergers, the number of pension funds in the Netherlands is expected to decline further in the coming years (PensionsEurope, 2016).

In Italy, the main drive for the pension fund mergers was the increasing costs, as managing a scheme is getting more and more expensive therefore wanted to attain benefits from scale. Yet, a major concern is that if there are too few large pension funds on the market, the competition will be lower, which could impact the members' interest and quality (Moreolo, 2009). Too much mergers activity of pension funds in one country can influence the competition market, as a low number of pension funds may lead to a situation of limited competition, compared to countries with more funds. As stressed in microeconomics, competition is supposed to lower costs and give higher returns. Still, the consolidation of pension funds may deliver individual advantages if the fees charged decrease and real return on investment increases (OECD, 2016a).

Even so, despite all the significant benefits that follow consolidation, it can be a very long and hard process. There are many possible difficulties to be encountered when consolidating in the pension sector, as there are several important matters that must be taken care of, such as funding levels, contribution levels, solvency, and the rights accumulated by the members. In addition to

legal costs adding up, the time spent on the process must also be considered (Ambachtsheer, 2016).

### 3.3 Size and performance

In connection with the main goal of pension funds, performance is an important basis of the expense of funding a pension plan. Decreasing long-term costs on investments can increase the returns and pension payments. This is connected to Ambachtsheer, Capelle and Scheibelhut's (1998) study, as they discuss three drivers of pension fund performance. These three drivers are fund size, proportion of assets passively managed, and quality of the funds governance. The study implies that with increased size comes increased economies of scale, lower unit OC and, moreover, the ability of having more professional management team. It is believed that it is easier for larger funds to attract qualified personnel and build better governance, while funds become more powerful as they are utilized in the funds favor. It is also believed that the funds gain more access to investment opportunities (Ambachtsheer, 2016). Dyck and Pomorski (2011) support this hypothesis. In their study of size and performance in pension plan managements from the CEM Benchmarking database, they investigate both IC and returns, and observe significant economies of scale, as the benefits of size are associated with better performance. Hence, bigger funds receive better returns than small funds. This implies that large pension funds with well-governed plans have the opportunity to increase the allocation to alternative investments and achieve higher returns because of a higher gross and net return with reduced IC. In Indro, Jiang, Hu and Lee's (1999) study of mutual funds, it is suggested that funds must attain a minimum fund size, the break-even fund size, in order to achieve good returns to justify their costs.

In one Icelandic study, Sturluson and Herbertsson (1996) wrote about whether efficient portfolios choices are made by the Icelandic pension funds. They found out that the largest funds had the best real return and the smallest funds had the next best real return. Thus, both performed better than the medium-sized funds. They argue that the reason for good performance of small funds could be connected to the fact that many small funds have assigned their portfolio management, at least to some extent, to specialized financial institutions that have experience in managing funds. The lower performance of medium-sized pension funds can be explained by transaction costs and in some cases lack of specialized personnel to manage them. Also, they found out that funds with secure pension payments dominated by the public pension funds performed the worst. They indicate that this could be related to incentive; incentives for the managers of the medium-sized funds to choose efficient portfolio is not as strong as for

other funds. They imply that the public pension funds' investment policy is to provide capital for the government and not to maximize returns (Struluson & Herbertsson, 1996).

Other studies indicate similar conclusions where there was a little evidence that the return raised necessarily to the proportion to the size of the funds. As shown in an older study from Grinblatt and Titman (1989), growth funds and funds with small asset values can achieve a great gross return. Yet, they have high costs that prevent them showing this performance by achieving a low real return. Bauer, Cremers and Frehen (2010) more recently performed a study on the cost structure and performance of a large sample of U.S pension funds. Fund size and performance are strongly negatively similar to Andonov, Bauer and Cremer's (2012) study. They suggest that large pension funds do not manage to transfer their lower IC into higher net returns and entails resulting diseconomies of scale in pension fund performance. Furthermore, both of the studies argue that pension funds with large asset class can have a low response level regarding changes in the market. Dyck and Pomerski (2011) also mentioned that there could be a chance of diseconomies of scale by replacing internal for external management if there are not specialized personnel in the matter. These are arguments for the simultaneous existence of diseconomies of scale, but they concern investment returns rather than OC.

Ambachtsheer (2016) implies that internal management generally outperforms external management as scale can allow the fund to hire people with specific skills and lower the costs. Besides, larger scale provides new opportunities on the market. He points out that generally, pension funds with large assets give greater opportunities to benefit from scale than pension funds with small asset can. Even so, scale is not a guarantee of good performance if you are lacking the right governance. Scheibelhut (1997) suggests the same with regard to what makes the best performing fund. Two of the factors were the size and the internal management, and the last was management that was able to reduce the costs and not increase them. Both Scheibelhut (1997) and Ambachtsheer (2016) agree that economies of scale does matter, where fund management and pension administration can greatly benefit.

In the most recent *Pension market in focus* published by OECD, it is indicated that countries with few pension funds seem to perform better than those with a large number of pension funds. The analysis made by the OECD was conducted on a sample of 20 countries, over the period of 2005-2015. They argue that pension systems, especially in Europe, are seeking economies of scale because of underfunding problems, or difficulty in trying to meet funding requirements. OECD indicates that in a 10-year period countries with relatively fewer pension funds were

more likely to have experienced higher real net returns than countries with more pension funds (OECD, 2016a).

### 3.4 Size and operating cost

OC consists of AC and IC. AC includes all expenses that are needed to operate a pension fund except for IC. These costs are roughly related to management, staff, communications, accounting, pension payments, and many others accrued costs. Investment costs are associated with portfolio management and analysis, fees, trading services etc. There are two large fundamentals determining the costs of pension provision; these are the quality of the pension scheme and the net rate of return on investments (Bikker & de Dreu, 2009). The literature of cost and economies of scale of pension funds is sizeable and suggest essentially the same that the costs decreases relatively as funds enlarge.

Bikker and de Dreu (2009) stress that the costs can have a big impact on the size of the pension benefits; thus, if the annual costs are high this can result in a reduction in the pension payments. They examined all Dutch pension funds from 1992-2004 and found that AC and IC in pension funds depend greatly on the size of the pension fund and can be influenced by economies of scale. Thus, funds can spread the costs over a larger asset base. They add that OC increases as the funds have more pensioners, and when fairly participants are inactive. Their results showed that the higher the asset class is and the higher the number of contributors, the lower AC is. Other studies support this, such as Lum's study (2006), which implies that size matters, as economies of scale are one of the reasons for lower costs in larger funds. There is a negative relationship between the cost and the size of the pension fund. The larger the funds are, the lower the costs are compared to the funds' total assets.

In Bauer's et al. (2010) study, it is implied that IC is higher in small portfolios than larger portfolios. Besides, the OC was higher when the portfolios were externally managed. In simple terms, large pension funds have much lower costs than smaller funds. This may be due to higher bargaining power and greater efficiency available to the large funds. The costs are an important factor in managing a pension fund as they can have a large effect on the rate of return on investments. Therefore, high costs will reduce the value of the pensioner's wealth and weaken the pension security as Bateman and Mitchell (2004) and Bikker and de Dreu (2009) confirm. In addition, they both propose that DB plans are more expensive than DC plans.

Three studies in different countries have been conducted on how the size of the pension fund affects the AC. The countries are the U.S (Caswell, 1976; Mitchell and Andrews, 1981), Australia (Bateman and Mitchell, 2004) and the Netherlands (Bikker & de Dreu, 2009). All of

these studies found significant economies of scale for private pension funds; the AC was lower in large asset classes. Furthermore, a study of AC of private pensions cross-country conducted by Dobronogov and Murthi (2005) and Latin America where James, Smalhout and Vittas (2001) conducted a similar analysis. These studies suggest that AC can be different among pension funds and between countries.

In Hernandez and Stewart's (2008) study, pension funds operating costs were compared across 21 different countries. They concluded that the lower costs were in the countries that had few pension funds. This result suggests that economies of scale can be quite important. Furthermore, a consolidation of small pension funds could improve cost efficiency since economies of scale are the main reason for differences in costs within pension schemes (Bikker & de Dreu, 2009). Ambachtsheer (2010) stresses the role of operating efficiency in optimal pension plans and Bikker (2013) also suggests that this is true; constant inefficiencies will harm future pension benefits, and this effect is stronger when returns are low. Therefore, an important strategy for a pension fund is to reduce these costs as much as possible. In order for smaller pension funds to significantly improve their costs efficiency, the solution would be to consolidate.

# 4 Methodology

The methodology section will explain the investigation process as to how the research questions are answered.

## 4.1 Research approach

The study is associated with two approaches; quantitative and qualitative research methods, in order to answer the research questions. Using these two different types of research has its advantages; this method enables the study to have a more diverse and improved evaluation, which will result in a better understanding of the subject (Bryman & Bell, 2015). Quantitative is the research approach that is number-based, using numerical data and other measurable factors to prove results, while qualitative research is associated with the use of words and analytical interpretations of other people's understanding and views of the object in question (Blumberg, Cooper & Schindler, 2014). The types of the mixed methods that is used in this study are both the Convergent Parallel Design but also the Embedded Design. That is, as the collection of the quantitative and qualitative data have equal priority and merged together to find the result but also having the quantitative or qualitative research as the priority approach to enhance whichever of the research approach as the approach alone will be insufficient for understanding the phenomenon of the subject (Bryman & Bell, 2015).

The quantitative research will be based upon a method of collecting and analyzing numerical data. The author analyzes the pre-existing numerical primary and secondary data from official Icelandic statistics. The qualitative research will be based upon a method of conducting in-depth semi-structured interviews with representatives in Icelandic pension funds (Blumberg et al., 2014; Bryman & Bell, 2015). In the end, a comparative analysis between Iceland and other Nordic countries will be used.

## 4.2 Data collection

The method of data collection is comprised of both monitoring and communication. Monitoring involves the researcher inspecting the activities of the certain subject of material without attempting to obtain a response from anyone. Communication is when the researcher asks certain individuals questions about the subject and collects their responses by personal means (Blumberg et al., 2014).

### 4.2.1 Numerical data

Part of the analysis was based on primary and secondary data obtained from pre-existing data from the FSA, which is the supervisor of all Icelandic pension funds as well for financial

institutions and insurance companies. The primary collection of the data was from annual accounts from 2003-2015 and is available to download in an excel format on the FSA's homepage. Each annual account contains the same information as does includes in annual reports but from each pension fund operating in Iceland combined in one sheet. This was of great benefit to the author, as the accounts had already collected all the information needed together in one sheet, sparing her the work of collecting and organizing the data herself.

The real returns data was collected from annual reports that were available on each pension fund homepage, in portable document format. Also, annual reports from a couple of pension funds that were analyzed were used to gather information about the pension funds before they merged with another fund. The information gathered mainly concerned their motives for the merger and their forgoing performance. The data collected for the comparative analysis was from pre-existing OECD reports and statistical information. The underlying data was taken from national pension authorities. The numerical data framework was developed using the primary and secondary data and other variables needed, both to calculate proportion, percentage, average over the period or to use the direct numbers from the collective data to form a good base to answer the research questions. The program that was used to gather the information was Microsoft Excel 2011.

### 4.2.2 Interviews

Additionally, in-depth interviews were conducted with seven directors, one interview in each pension fund selected. Representatives of ten funds were contacted via e-mail, seven of which agreed to participate in the study. Thereafter, an agreement was made via e-mail about what date and time best suited the respondents. The only information each respondent was given about the research topic was the core content, sent along with the first e-mail. Further information was withheld, in order to ensure that the respondents' answers were not researched or prepared ahead of the interviews. This allowed the interview to be less structured and more flexible. Only the directors of the pension funds were contacted, apart from in the case of one pension fund where the asset manager was contacted because of previous communication in connection to pension funds and made sure beforehand that he would be able to answer as well as the other directors regarding that subject. The interviews took place during a seven-day period in March and April 2017. All interviews were conducted face-to-face. The location of the interviews was mostly in the office or in a conference room of the pension fund. Before starting the interview each respondent was asked for permission that their name and the name of the pension fund could be used in the study. However, the part of the interview relating to understanding and views on the thesis subject would be anonymous to protect their privacy. Six

men and one woman were participants; four of them had had more than two decades' experience and three of them had one year to several years' experience.

The development of the interview framework was first to gather more knowledge of the topic by understanding how the Icelandic pension system works, its fundamental and then reading numbers of articles in connection to economies of scale in pension funds. Therefore, based on previous literature, knowledge of the system and mainly to target information that can answer the research questions. A decision was made to do in-depth and semi-structured interviews. In a semi-structured interview the respondent has a list of questions that are in the form of an interview guide, with a framework of themes to be explored. The interview guide was used as a reference and questions did not necessarily follow the guide precisely. The decision to have semi-structured interviews was made in order to allow the interview to be an open experience, providing an opportunity for important information, not covered in the prepared questions, to be brought up during the interview (Edwards & Holland, 2013). However, all questions on the interview guide were asked and similar wording was used with each interviewee, and the participants were all interviewed in similar situations.

The interviews were recorded on an iPhone at the beginning of the interview after introducing the participants to the theme of the subject and getting permission from each interviewee to record their answers. The interviews were conducted in Icelandic and the coding and the theming process as well. The length of each interview varied; the shortest was 25 minutes and the longest was 1 hour and 14 minutes. Each interview was transcribed shortly after the interview took place to have it fresh in the interviewer's memory, and in order for the transcription to be as accurate as possible. The questions used in the interviews can be found in Appendix 4 and the timeline of the interviews can be found in appendix 5.

## 4.3 Pension funds selected

The selection of pension funds for this study was done through purposive sampling. Research participants are chosen specifically for the quality of the study (Tongco, 2007). The pension funds selected are all Icelandic, falling into the size category of large to giant-sized funds, both in the private sector and the public sector. Six of the seven selected funds had merged before. Several different kinds of mergers were analyzed to get a broader view of the motives behind mergers. One of the pension funds had never merged, but had been the largest pension fund in Iceland for many decades, and was selected for that reason. The pension funds are *The Pension Fund for State Employees, Gildi Pension Fund, Birta Pension Fund, Stapi Pension Fund, Almenni Pension Fund, General Pension Fund* and *Brú Pension Fund.*

## 4.4 Data analysis

The data analysis is twofold, the first part concerns the numerical data and the second part concerns the interviews. The analysis was conducted using Microsoft Excel 2011 and Microsoft Word 2011. Three analyses were made:

- *Economies of scale* where both numerical data and interviews were used.
- *Previous mergers and number of funds* where both numerical data and interviews were used.
- *Comparison* with three Nordic countries where only numerical data was used.

All of the data was based on an annual basis, so that developments over time can be investigated.

### 4.4.1 Numerical data

The data analysis of economies of scale was conducted using data from 26 active operating funds in 2015, excluding one from the analysis later on since the fund interfered with the analysis, giving a total of 25 funds analyzed. The reason for the exclusion was that the fund had employer guarantee as well as extremely high numbers in costs, which had no correlation to the other funds, and it was not able to fulfill the requirements made of pension funds. Also, no data was found on real return. The 26 pension funds were placed in an Excel spreadsheet, along with the specific data collection from FSA for each pension fund. The time period was 2011-2015. Then the funds were categorized into five different groups dependent on their size. The logic behind that group differentiation was to combine funds that were similar in size and try to provide noticeable difference between the groups. For each of the five years, the author grouped them by size, but most of them all stayed in the same categorization during the five-year period, there seemed to be no significant changes to assets of the pension funds[2].

After grouping them according to asset size and all data regarding total assets, real return, OC, AC and IC were assembled. Then a calculation of the OC of total asset was made to give a percentage number for each pension fund from 2011 to 2015. The formula is OC divided by total asset. After, calculating the percentage for each pension fund, a calculation for each group was made. In this formula the sum of OC was divided by the sum of the total assets of each special group size from 2011 to 2015. This resulted in an average for each group for each year. The calculation made for the real return was to find the average real return for each of the groups. The formula was the sum of the real returns divided by the sum of the number of funds that were in each of group size.

[2] See Appendix 6 for the grouping.

The data analysis of the previous mergers was on five pension funds, were their costs and assets was investigated before and after the merger. One fund had only recently merged and so there was no available data after the merger. The data was analyzed in one Excel workbook for each pension fund. The time period was one year before the merger and two years after the merger. The factors that were analyzed are OC, AC, IC, total assets and the total OC of the pension fund system. The other part of this analysis was to estimate how the pension funds that took part in the merger would have developed if they hadn't merged at that time. To find an estimation of how the pension funds would have developed the author started to categorize the funds using the same grouping method as mention before, grouped into five asset size classes[3]. Thereafter, gathered data about OC, AC and IC on the pension funds groups from a period of 2003 to 2015. Then the sum of AC, IC and total assets of each group was gathered into another Excel workbook for each year. The next step was to calculate the OC divided by the total assets for each year. In addition, in order to demonstrate costs more precisely, the author distinguishes between the AC and IC of total assets. This gave the author a well-described data set for each group for each year; which can be found in Appendix 8. Then in the analysis when the author investigated the estimated development, the funds were placed and were analyzed in to the right asset class and used that to compare to the merged fund. To give a simple explanation, pension fund A (large fund) and pension fund B (medium fund) are about to merge to form pension fund C. Therefore, it is possible to place pension fund A in the large fund group, since that fund is a large fund, and use that as a comparison with pension fund C. Meanwhile pension fund B is placed in the medium-sized fund group. Hence, estimation of each group size was compared to the realistic data of the merged fund.

The data analysis of the comparison with three Nordic countries was made using the collective data and transferred to Excel, where the analysis was presented mostly in figures.

### 4.4.2 Interviews

All the interviews were recorded and transcribed by listening to the recording. The interviews were all conducted in Icelandic but translated into English when analyzing. To reduce the risk of incorrect translation or mistaken interpretation of the sentences the interviews were transcribed in Icelandic to have them exactly correct word for word. When the interviews were transcribed they were read and analyzed separately. Results were obtained by summarizing the main outcomes from each interview, which was done by reading over and listening to the interviews and placing them into themes according to the content, rather than categorizing each interview separately. Themes were created to isolate the information that best related to the

[3] See Appendix 7 for the grouping.

research questions. In some themes, the respondents are kept anonymous, but in the sections regarding general information about mergers and discussion related to previous mergers, the name of the representative of the fund is given. The seven pension funds are defined as pension fund A, B, C, D, E, F, G when anonymous for the other themes.

# 5 Analysis

This section will begin with an investigation of the Icelandic pension funds from 2011 to 2015. The funds will be classified by size and compared together on costs and real returns. Next, several prior mergers of pension funds will be introduced, and the main reasons for the consolidation will be investigated. Moreover, the funds will be examined before and after the merger to see whether the increased size was beneficial for the funds. Lastly, a comparison with other Nordic countries will be made to gain a more international perspective. All amounts are in the currency ISK unless otherwise stated.

## 5.1 Economies of scale

The findings on the views of economies of scale and experience between the respondents from the interviews were very similar. All respondents said that economies of scale are important for funds to move from being a small fund to a larger fund, and to be able to operate like a pension fund should do. The factors they mentioned that influence economies of scale were costs, staff, performance and service. All of the respondents said that their fund was large enough to attain economies of scale. The scale advantages the respondents named were lower costs, resulting in higher real returns in the long run and better access to investment options. Moreover, the ability to have more knowledge and expertise, the ability to provide better service, and finally the ability to fulfill all the requirements imposed on pension funds. Pension fund F indicates that the largest 10-11 funds are doing well and most of them are achieving advantages of scale but the remaining 15 funds need to consider their place. This is especially the case if the funds have the same real return as the largest fund, because if the costs are high the real return is much lower than the gross return. The real return has potential to be much higher if the OC would be lower. Pension fund B also implied that the largest pension funds are always asked to help with amendments in the system; therefore they can have much greater impact because of their size. Accordingly, this responsibility has to be taken very seriously, and good governance is essential. The respondents all mentioned that when the fund gets larger it is possible to receive lower IC because of the amount of larger investments; therefore, the fund is able to negotiate lower fees, something that small funds are less able to do.

Two of the seven respondents gave especially positive responses when approving the statement that *bigger is better*. But the others stated the following; Pension funds A and C stated that bigger is sometimes better, especially in a pension environment where you need to be large in order to be able to meet the required workload. Pension fund A added that medium-sized fund doesn't really have to be worse than the larger ones only if they are able to meet the pension

funds requirements. Pension funds D and E didn't want to generalize by saying that *bigger is better* but size is an advantage, and didn't believe that there is an equal sign of being larger and larger and therefore better and better. Moreover, Pension fund G revealed that even if you are very large, there is a possibility that internal operations are very inefficient because the fund may be *too* large, and good governance may be absent, resulting in diseconomies of scale. Hence, the size must have some limits and perhaps there is an optimal size that provides the best advantages of scale.

Diseconomies of scale can result when the funds are perhaps *too* large and flow of information and operations are lacking due to poor governance as Pension fund G implied above. There can be a disadvantage to being too large as Pension funds A, B and E mentioned that it is bad when a fund is so big it can't move on the market without affecting the market. Pension fund B and E, compared a big fund with an oil tanker ship, which needs much more room and power to maneuver than a speedboat does. The smaller funds can move quickly on the market, without anyone taking much notice, but if large funds with large investments moved it would result in a great change on the market, especially in a small economy such as in Iceland. Therefore, being a large fund is not purely an advantage. The Icelandic market is very shallow and for the past 9 years pension funds have been under capital controls, which have left them with few investments options in Iceland. For example, the shareholders of the Icelandair equity (airline company established in Iceland) are the four largest pension funds with 35.92% share (Keldan, 2017). This can have an effect on the preferences of the fund members; if a particular company is having difficult time it is hard for the large funds to sell their share but for the small funds much easier as the number of shares are smaller. This can mean that members in the small funds will not experience a loss in their assets, while members in the large funds will.

During the analysis, the data showed obvious results of the giants having the lowest OC accounted of the assets through the years. Whether the IC was higher than the AC between funds seemed somewhat random, but in this analysis only the result of OC will be discussed.

In Figure 5, the results of the group's OC of total assets are presented. Giants are presented as the blue line, large funds presented as the red line, medium funds presented as the green line and small funds presented as the purple line. One can see the noticeable differences between the giants and the other groups during these years. The giants have moved slightly downward through the years, with improvements along with the large funds and medium funds indicating that the OC are rather stable during the five-year period. But, the small funds have not improved

and have more flexible movements than the others and indicate rather unstable OC during the five-year period.

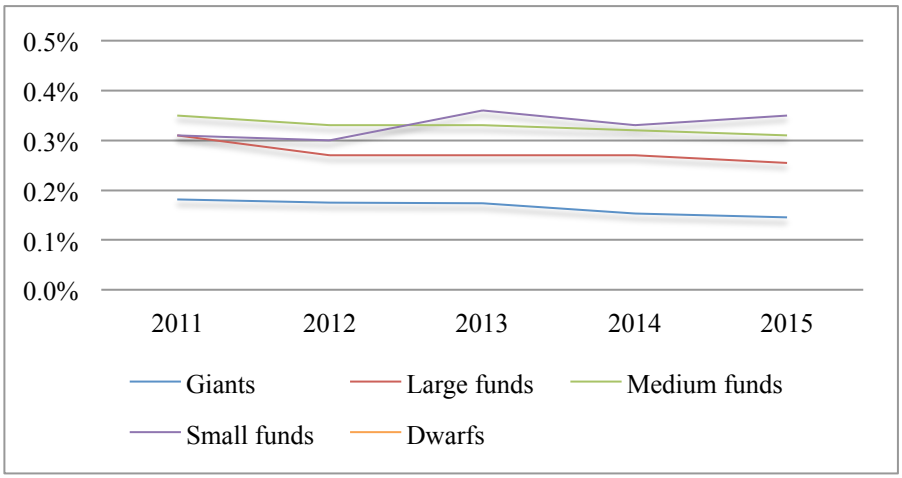


**Figure 5:** The operating costs as a percentage of total assets from each size group, 2011-2015. Source: FSA and author calculations.

There is a difference of around 9-13% between the giants and the large funds from 2011-2015. Then the gap between the groups narrows to 5% and lower. In 2011, the large funds and small funds had the same cost percentage. But since then the small funds costs increased by 4% over the period of 2011-2015. As the reader may notice, the orange line (dwarfs) is not in the figure; this is because their OC goes over 1%. In 2011 they had 1.66% and in 2012 they reached 2.08%. In 2012, five funds in the group dwarfs merged into a large fund called Brú Pension Fund. Therefore, no fund was left remaining in the dwarfs group. The giants always had OC under 0.20% and interestingly so did one small fund.

During investigation of the real return the author found no similar consistency as was shown in the OC. Given lower transaction costs it would be expected that the larger size of the funds would have a positive influence on their performance, but this result is not at all obvious. In Figure 6, the group performance results are presented. Giants are presented as the blue line, large funds presented as the red line, medium funds presented as the green line and small funds presented as the purple line. It's interesting to see the giants and the large funds go downward in 2013 and are moving in the similar movement unlike the medium funds and the small funds that go upward in 2013 and are moving in the similar movement. This could be a result of different investment policy and asset allocation. In 2015, the real returns across all five groups are remarkably similar, and the percentage achieved is outstanding for all the groups apart from the giants, which had performed better a year previously. What is noteworthy is that the groups of small funds usually performed better than medium-sized funds.

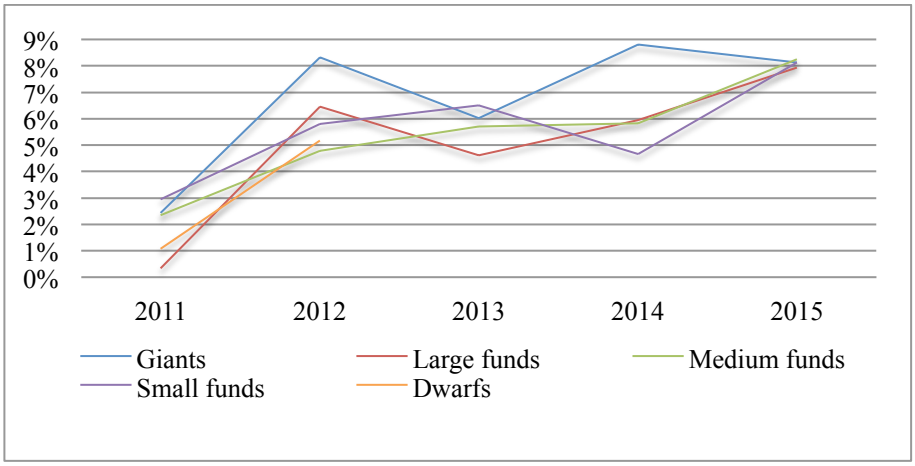


**Figure 6:** Real returns from each of the size group, 2011-2015. Source: FSA and author calculations.

The top five highest real returns for each year were moving between different asset classes. Yet, the giants performed the best, with exceptionally good returns overall compared to the others over the period. The small funds also obtained good returns, coming in second. There were four pension funds that placed three times in the top five with the highest real returns; these were two giant funds, one medium fund and one small fund.

The giants were the Pension Fund of Commerce (PC) and the Pension Fund for State Employees (PSE), which has both the biggest asset size and the lowest cost percentage on average, 0.16%. The one small fund and one medium-sized fund were the Pension Fund for Employees of Búnaðarbanka Íslands hf (PEBÍ) and the Pension Fund for Nurses (PN), where PEBÍ had the lowest cost percentage in the small funds group, at an average of 0.13%, and PN has employer guarantee with cost percentage 0.25% on average. As stated by Pension fund A, the reason for the good performance and low cost percentage could be connected to the fact that small funds have external management in banks or in larger pension funds. Instead of merging them together, the banks or funds operate many funds together, thus reducing the need for a merger, and allowing the funds to partly achieve the most impactful effects from economies of scale but not all.

Consequently, the reason for PSBÍ's low costs could be that the fund has external management from Arion banki hf where they pay the AC and inner audit. Yet, the fund pay wages for board members, supervision fees, audit and actuarial assessment. This is closed fund that does have no cost regarding new members, so it should therefore have lower costs than an open fund (Arion Banki hf, 2016). PN has an agreement with the next largest fund in 2015, but have often been the largest, (PSE) to manage the fund. This means that the funds share the costs, which commensurate with the scale of the operation of the fund taking into account economies of scale

(LSR, 2016). There are six of ten medium funds and all of the small funds that have external management through banks or other larger funds. Five of the small funds are closed in the sense that they don't take on new members, and without having PSBÍ included in the formula for small funds, the cost percentage would be close to 0.50%. Therefore, the PSBÍ fund alone distorts the analysis of the small funds group due to its strong performance with regard to costs, even though all the small funds have external management. Perhaps the PSBÍ fund has the best external management, as it varies where the external management is between funds. Yet, it is not possible to generate that small funds with external management should have lower costs. It seems that only those funds mentioned above experience a low cost percentage but the good performance of the small funds could be connected to the fact that their asset management is assigned to banks or to large pension funds, where the required expertise can be found.

As a whole, the asset size of all pension funds has increased by approximately 1/3 from 2011-2015. This entails that the Icelandic pension fund system is growing rapidly. Also, the costs has decreased for most of the groups except for the small funds but the average real return over the period was 5.70% meaning that the pension system was able to achieve the 3.5% benchmark required by regulations. Moreover, some of the Icelandic pension funds are operating very cost efficiently; as in 2015 the average of the OC was 0.26%.

In Table 3, the average percentage of OC and real return from 2011-2015 is presented. The result is interesting; the table shows that the giants are obviously performing well, both in costs and real returns.

**Table 3:** Average OC and real returns from 2011-2015. *Dwarfs from 2011-2012. Source: FSA and author calculations.

| Groups | Average cost percentage | Average real returns |
|---|---|---|
| **Giants** | 0.17% | 6.74% |
| **Large funds** | 0.27% | 5.06% |
| **Medium funds** | 0.33% | 5.15% |
| **Small funds** | 0.33% | 5.88% |
| **Dwarfs** | 1.87% | 3.12% |

The dwarfs are the most expensive ones, with expense per group decreasing with group size. However, in the real returns section, the small funds place second best, with large funds placing last. This provides strong evidence that perhaps small funds achieve particular effect of the economies of scale from the specialized financial institutions that have professionals, the banks or by the large pension funds that are able to have specialized asset mangers because of economies of scale.

This analysis has been focusing on two factors in pension funds, the costs and the real returns. It seems that the nature of economies of scale does in fact have an influence on both of these factors. The results of the analysis imply that the giants have the lowest costs and the best real returns. Their assets are, at the minimum, three times larger than funds in the large funds group. It is not clear whether this is the optimal size for achieving the best advantages of economies of scale, and whether they would incur diseconomies of scale if they were larger than they are. It seems that the large funds in the pension system haven't gained the optimal size for achieving the most of the nature of economies of scale. It is obvious that there is still opportunity for them to enlarge and become closer to the size of the giant funds, and thus perform better. Particularly noteworthy is that the relative costs in other groups are nearly double to that of the giants. If the other funds would aim at same cost percentage it could provide them better real returns.

## 5.2 Previous Icelandic pension fund mergers

In Chapter 2.4, it was shown that for the last 25 years, the number of pension funds has decreased by 72%. In the year 1997, the environment for Icelandic pension funds changed following new legislation; increased requirements about profitability, competition and constricted supervision and requirements for pension funds operations that have significantly increased in the recent years. Pension funds may have seen increased benefits by merging in order to be able to follow the developments that have taken place in both the environment of pension funds and that of the financial market. In the following sections several prior mergers of pension funds will be introduced and the main reasons for consolidation will be investigated. Moreover, the funds will be examined before and after the mergers to see whether the mergers and the increased size were beneficial for the funds.

All of the respondents said that the process of a merger can vary between funds, sometimes there are long negotiations and the process can be difficult if the funds to be merged have different pension right plans. Resolving this difference can delay the process. In addition, it is important to make sure that the merger process proceeds as smoothly as possible, at a good pace and in a clear and structured way. Pension fund B explained a simple overview of the process: first is the merger negotiation, then there is a merger agreement following an introduction of the potential merger to the fund members, a classic annual meeting is held and then another meeting to get a final approval. The final step is to go through the Ministry of Finance to get an approval and obtain permission to operate. This process always takes a couple of months, and can take longer.

There are many factors that need to be kept in mind when it comes to mergers. Pension fund E implies that the most important one is a good, clear agreement between both parties, because there is often a difference between the funds. The funds need to compare the equities and liabilities of the funds. Sometimes there is a sensitive issues regarding different actuarial position with funds, because it needs to equalize the pension rights so all members will be equal when the merger takes place. It is always difficult if it is necessary to reduce the pension rights and three other respondents agree. Other factors, mentioned by Pension funds B and F, are the position of the funds, actuarial position, structure of the fund members, assets allocation and an overview of the assets needs to be available and up to date. Moreover, it is good for the funds to know each fund operation including knowledge and staff. Yet, some funds may be undesirable, as Pension fund G points out, if the fund has a high ratio of disability then there is a possibility that the fund will have to reduce the old-age pensions. Pension fund C mentions that the desirability of a fund can also depend on whether the fund is young or old, as the older funds can't afford to suffer as much fluctuation in their assets and investments, as they will have to pay pension to their members soon.

When the respondents were asked to propose positive things about merging, everyone said that it leads to economies of scale or cost efficiency. Pension fund E also added that this could improve staff performance; the novelty of the merger can result in a change of pace and more engaged and interested staff. Pension funds B and D implied that mergers offer more specialized people to fulfill the requirements that are required by the funds, as small funds are unable to fulfill them. Pension fund C mentioned that a merger provides an opportunity to do larger investments or investment projects and Pension fund G said it improves quality and vision as well. Pension fund F implied that larger fund is able to diversify the risk much better and able to provide the security regarding pension payouts. Moreover, merged fund has the ability to improve the service, especially for a previously small fund that outsourced its management and the members will be able to receive more personal service through direct communication but not through e.g. a bank.

Most of the respondents were not able to propose a single negative thing about merging with another fund, as long as the merging process was done well. But Pension fund B mentioned that funds may perhaps be too large as a result of a merger, meaning that they can't move on the market without making a significant movement on the market itself. Yet, Pension fund G mentioned that small funds that are in connections to unions, community or employees associations might feel like they wont have as much overview as before the consolidation and therefore, won't consolidate due to that reason.

### 5.2.1 Birta Pension Fund

Birta Pension Fund was formally established on December 1st 2016 when the Ministry of Finance approved the pension fund. The fund was created through the merger of Sameinaði Pension Fund (Sameinaði) and Stafir Pension Fund (Stafir). Both of these funds had previously been created through a merger. Sameinaði was established in 1992 with a merger of the Pension Fund of Constructions Workers and the Pension Fund of Metal and Shipbuilding Workers, and up until 2002 six other pension funds had merged with Sameinaði. Stafir Pension Fund was created through the merging of two fairly large funds, Samvinnu Pension Fund and Lífiðn Pension Fund, in 2007 (Birta lífeyrissjóður, 2017).

The merger had a long informal anticipation but the formal merger negotiation didn't begin until May 2016. The merger negotiations went smoothly, encountering no significant obstacles along the way, as the funds were similar in structure; both of them had an industrial sector base and their unions and employer associations also had an industrial background. Also, their asset distribution was very similar and in 2015 they had exactly the same real return (Birta lífeyrissjóður, 2017). The desire for both parties to merge had existed for a long time but since the actuarial assessment of both of the funds was good it gave an opportunity to really start the formal merger negotiations. Additionally, the motive was first and foremost to achieve economies of scale. Both of the funds wanted to go towards increased efficiency and operational size in terms of staff and knowledge, and to gain more cost efficiency in the long run. Before the merger they were both strong funds with good performance, but both realized that the merger would result in an even stronger fund with a better performance than previously. By merging they wanted to have as low cost percentage of total assets as the largest funds and with the power of the size and be able to enjoy better terms of trade. Sameinaði had to lower their pension right by 1.1% to even out the pension right between the funds (L. Ólafsson, personal communication, April 4, 2017).

In 2015 the total asset of Sameinaði was 171.1 bn.kr and was placed 7th out of the largest funds, while Stafir had 140.9 bn.kr and placed 8th. Together they had 312 bn.kr, with 55% of the assets coming from Sameinaði and 45% from Stafir. As Birta, they are now placed 4th out of the largest funds, as shown in Table 4. One can see that Birta has got closer to the giants and has decreased the gap between the giants and the large funds. Yet, Birta is nearly twice as big as the fund next in line, Stapi.

**Table 4:** The five largest funds and their total assets in 2015. *Birta assets are calculated to include both Sameinaði and Stafir's assets in 2015. Source: FSA.

| Funds | Assets |
|---|---|
| The Pension fund of Commerce | 583.7 bn.kr |
| The Pension fund for State employees | 582.9 bn.kr |
| Gildi Pension fund | 455.0 bn.kr |
| *Birta Pension fund | 311.9 bn.kr |
| Stapi Pension fund | 179.2 bn.kr |

Ólafsson said that no costs reduced right away with the merger, except for housing and perhaps unit cost and relative personnel cost. Both of the funds were operating well and had lower costs than the funds they were in line with. Yet, the costs will slowly come down in the long run. The increased size and synergies gave an opportunity to invest more with lower fees. The cost is an important factor as it can affect the real return and with lower cost then the higher pensions for the members, as it is realistic to have an effect on the cost but not the return. The merger of Birta enabled the fund to combine valuable, experienced staff and allow them to learn from each other, increasing overall expertise. Also, Birta was able to offer the position of risk manager as a full time job, where its predecessors had not. They gained the power to participate in investments and considerable assets without high costs (L. Ólafsson, personal communication, April 4, 2017).

### 5.2.2 Gildi Pension Fund

Gildi Pension Fund was founded on June 1st 2005 when Fishermen's Pension Fund (LS) and Framsýn Pension Fund (LF) merged. Both funds were similar in size and had been having good real returns for the last few years. Even so, the difference between them was the combination of members. The members in LF had a rather large group of people under 30 years and over 50 years, with the majority of the women. The majority of members in LS were men aged 30-50. LF had more members than LS, but was still similar in size. The main desire for the merger negotiations came from LS because they found it too risky to run a fund with such a homogeneous group, and they estimated that competition would grow between the pension funds. Therefore, LS wanted to merge with another fund that would increase the range of members. Preliminary discussions with LF revealed a mutual interest since both of the funds wanted to increase the security of pension payouts, efficiency and financial progress – all things that would be easier to obtain as a larger fund. Nevertheless, the merger negotiation took about a year because of the need to make adjustments to LS's pension rights system, as it was necessary for members across both funds to have the same pension rights. Therefore the pension rights at LS increased about 4.1% for their members. The merger was on an equal basis and the

whole process went smoothly with few shortcomings (Á. Guðmundsson, personal communication, April 3, 2017; Lífeyrissjóður Sjómanna, 2005). Furthermore, the aim of the merger was to ensure the best pension possible for all members along with better industry risk diversification, stronger risk management and increased asset management (Gildi lífeyrissjóður, 2017).

LS had a great likelihood of higher disability members than under normal circumstances. Their paid out disability pension was 42% of their total payout in the year 2004. They had to take action to meet the increased disability claims and this was a cause for future concern (Lífeyrissjóður Sjómanna, 2004). LF, too, had high disability but the reason for the merger was not a focus on decreasing the disability rate but rather to increase the range of the foundation of members and gain cost efficiency by being a larger fund (Á. Guðmundsson, personal communication, April 3, 2017).

Before the merger, the total asset of LF was 76.3 bn.kr and at the time the fund was the 3rd largest fund. The total asset of LS was 68.5 bn.kr, therefore the 4th largest fund. After the merger their total assets nearly doubled and in 2005 their total assets were 181.3 bn.kr. That would give them 15% market share at that time. After the merger, they placed as the 3rd largest fund and still do today.

**Table 5:** Costs factors of the merged fund and its precursor funds.

| Funds | OC | AC | IC |
|---|---|---|---|
| **Gildi // 2005** | **0.18%** | **0.12%** | **0.06%** |
| LF // 2004 | 0.25% | 0.16% | 0.09% |
| LS // 2004 | 0.16% | 0.12% | 0.04% |

In Table 5, the OC, AC and IC are presented both before the merger as LF and LS and after the merger as Gildi. LS had a very low cost percentages compared to LF and this suggests that LF benefited a lot regarding cost efficiency with the merger.

When comparing Gildi to the pension fund system in 2005, Gildi has one of the best OC, as the system had 0.28%. The second year for Gildi was even better with 0.16% of total assets with decreasing AC around 0.5% and the same for IC. The pension fund system had OC of 0.23% in the same year and Gildi performed better.

In order to be able to consider whether the merger was beneficial, a comparison of the estimated development with and without a merger (of LF and LS) is simulated in Figure 7. Since both of the funds were large, they are both eligible to be placed in the large fund group. In the figure, the blue line is the estimated development of the OC if there would have been no merger and

the red line is the actual data of the OC from Gildi. One can see that the merged fund achieves lower costs than with no merger through the years. They seem to be following a similar pattern, however, in 2011 the upward slope is due to unusual tax on pension funds because of special interest subsidy introduced by the government to indebted households. The tax was 0.0814% of total asset (Stapi lífeyrissjóður [SL], 2012). Yet, it seems that it didn't affect Gildi as much as it did in the estimation.

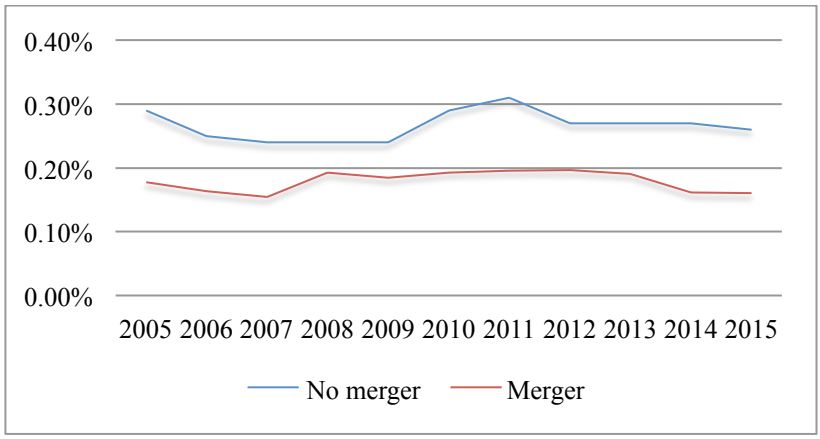


**Figure 7:** The operating costs as a percentage of total assets, both for the estimation with no merger and Gildi from 2005 to 2015.

The estimated AC and IC through the years show that with the merger, Gildi was able to achieve cost efficiency in both AC and IC, especially regarding IC, as it was close to 50% lower. Even so, both of the funds had very low IC compared to other funds in the same group size. Therefore, it is not really known if LS and LF would have increased their IC as much as the analysis of the estimation showed[4]. Nonetheless, it is certain to say that with the merger they gained a larger size that enabled them to attain better contract fees and lower investment fees than before, as well as lower handling costs because of increased scale (Á. Guðmundsson, personal communication, April 3, 2017). Also, LS had much lower AC and was operating under high cost efficiency. So, perhaps it possible to say that LS didn't achieve lower costs but stayed on the same path.

But altogether, the funds became stronger with the merger as a number of staff with different specializations and knowledge came together. Many of them had years of experience and therefore increased the strength of the fund. With increased pressure from regulators in recent years, Gildi have had to hire highly-skilled professional people to meet new requirements. After the economic crisis the requirements, writing reports and qualifications became stricter and more frequent and Gildi had to increase its costs to fulfill its role. Putting less trust into external

[4] See Appendix 9 for figures and the year before the merger.

management following the economic crisis, they wanted to work on a more internal basis instead. Therefore, the internal analysis effort is much better than before though it does not result in the returns, as they would have wanted. Guðmundsson implies that there is no correlation between real returns and scale. This instead gives them better knowledge of that they are investing in and the terms, resulting in more informed decision-making. Additionally, the increased number of specialized staff provided the fund with the best efforts to provide a good service and meet obligations to their members, such as they perhaps wouldn't have been able to without having merged (Á. Guðmundsson, personal communication, April 3, 2017). Yet, the costs decreased shortly after the merger because of certain factors: two boards became one, and housing costs decreased while efficiency in the service increased.

Guðmundsson mentioned that the benefits that the merged fund obtained because of larger size were that the fund gained increased ability to fulfill all the requirements imposed on pension funds. Because of their size they receive all the investment options but on the other hand it cost more works going through them all. Regulators and government look at the largest funds when deciding to change regulation or make any adjustments in the system and the funds are able to have an effect because of their scale in the system. This does only apply to those funds that are the giants in the system (Á. Guðmundsson, personal communication, April 3, 2017).

### 5.2.3 Stapi Pension Fund

Stapi Pension Fund was approved by the Ministry of Finance on June 18th 2007. The boards of the Austurland Pension Fund (PA) and Norðurland Pension Fund (PN) signed a merger agreement on November 15th 2006. Merger negotiations had been underway intermittently for about one year. The merger of the funds was approved and formally founded at the annual meetings in March 2007. It was decided that the combined fund would be called Stapi Pension Fund (SL, 2017). This was not like the Gildi merger between two funds of similar size; in this case there was a fairly large fund merging with a medium-sized fund, with PN holding 67% of total assets, and PA holding 33%. PN had to raise their pension rights by 2.75% to equalize the status of the funds. Notably, both funds placed great importance on maintaining close ties with home regions and rural areas.

Yet, the original idea of merging funds was the consolidation of four pension funds in order to establish a large pension fund in Iceland's rural areas. It was to be created through a merger joining the funds of the north, east and west of Iceland, and the pension fund found on the small island called Westman Island. Yet, this merger broke off and instead PN and PA alone resumed the merger negotiations. The merger was in line with the developments that had taken place

over the pension system for years. Emphasis was on lowering the number of funds, expanding and strengthening them through this process. Economies of scale were a motive for the funds to merge, increasing their strength and lowering their costs, as well as opening up an opportunity to hire specialized people (I. Björnsson, personal communication, April 2, 2017). Further motives for the merger were to increase operational efficiency, improve risk diversification and return on assets, as well as to maximize pension rights that merged funds can provide their members with (SL, 2017).

Before the merger, the total asset of PA was 27.5 bn.kr, which placed the fund 12$^{th}$ out of Iceland's large funds. The total asset of PN was 56.4 bn.kr therefore placing as the 8$^{th}$ largest fund. After the merger their total asset in 2007 was 92 bn.kr; the total asset of PA rose by a third. Moreover, for PA having 1.83% market share grew to 5.42% with the merger with PN. The merger placed the new fund as the 6$^{th}$ largest fund and in 2015 Stapi was the 4$^{th}$ largest fund.

**Table 6:** Costs factors of the merged fund and its precursors.

| Funds | OC | AC | IC |
|---|---|---|---|
| **Stapi // 2007** | **0.18%** | **0.12%** | **0.06%** |
| PA // 2006 | 0.30% | 0.10% | 0.20% |
| PN // 2006 | 0.18% | 0.12% | 0.06% |

In Table 6, the OC, AC and IC are presented both before the merger as PA and PN and after the merger as Stapi. PN had a very low cost percentages compared to PA and one could say that PA attained great benefits through the merger regarding IC. PN has exactly the same OC, AC and IC after the merger.

When comparing Stapi to the pension fund system in 2005, Stapi was below the system's OC, at 0.23%. The second year for Stapi was even better with 0.15% of total assets with AC decreasing by 3%. The pension fund system had OC of 0.22%, shows that Stapi performed much better than the system.

In order to find out if the merger was beneficial, the estimation of the development of the PN will be placed in the large group and the estimation of PA will be placed in the medium group. The comparison of the estimated development with and without a merger (of PN and PA) is simulated in Figure 8. The blue line is the estimation of the OC of PA and the green line is the estimation of the OC of PN if they wouldn't have merge. The red line, however, shows the actual data of OC from Stapi. One can see that the merged fund has very low cost percentages compared to the funds prior to the merger and they follow a similar pattern.

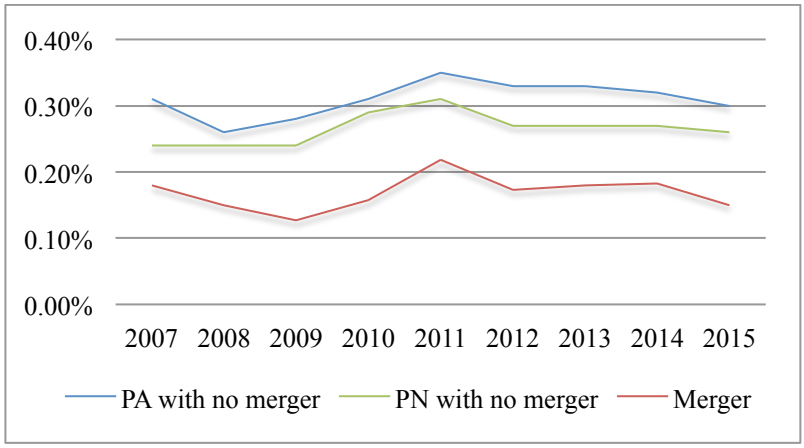


**Figure 8:** The operating costs as a percentage of total assets, both for the PA and PN estimation with no merger and Stapi from 2007 to 2015.

Notably, the AC of PA had been relatively low compared to other funds that were similar in size the year before the merger. It is however unknown whether PA would have continued to have the same costs, particularly as many funds like Stapi, had to improve the funds internal operations because of more regulation were imposed on the pension funds after the financial crisis. Therefore, recruiting more staff for asset management, risk management and develop a future strategy in various aspects of the operation to be able to achieve the funds goals and meet the expectations and demands of their members (SL, 2012; 2013). This resulted an increase in the costs as shown in 2010-2011 in the Figure 8 and as well the unusual tax on pension funds because of special interest subsidy to indebted households. The tax was 0.0814% of total assets and therefore nearly doubled the AC from 2010.

The estimated AC and IC of PA were higher than that of the merged fund, thus implying that PA would not have been able to achieve as good a cost percentage as Stapi without merging. The estimated IC of PA is lower than before the merger but wouldn't be even close to the IC of Stapi throughout the years without having merged. The same can be said of PN; Stapi AC were much better than PN's for the first two years; then in 2011, Stapi reached the same cost percentage and has remained on a consistent trajectory since then. Notably, the PN's IC before the merger was very low, at around 0.06% and the estimated IC nearly doubled in the analysis. Therefore, the difference in IC between Stapi and PN is very high in the estimation and possibly the development of the IC wouldn't have increased as much as it did in the estimation[5]. Even so, for both of the funds the merger is estimated as being beneficial. The merger was the right step to take in order to attain economies of scale as the fund became larger and therefore achieves better contracts on investments fees, since the analysis points out that the IC got really low by

[5] See Appendix 10 for figures and the year before the merger.

the merger. Nevertheless, the amalgamated fund became stronger fund to meet their obligation and requirements (I. Björnsson, personal communication, April 2, 2017).

Björnsson implies that establishing the fund Stapi was absolutely the right decision as Stapi is doing better than if both of the PN and PA had gone their separate ways. He argues that Stapi were able to hire more professional staff in asset management and for smaller funds it is not possible as it is simply too expensive. Stapi has achieved the desired size that enables a fund to have specialized asset management and maintain the quality of the investments. Moreover, in the long term it should and has provided good returns and performance (I. Björnsson, personal communication, April 2, 2017).

### 5.2.4 Almenni Pension Fund

The Almenni Pension Fund consists of eight pension funds, which have merged, but at different times. Therefore, the fund's origins are both long and solid, extending over many decades. The roots start in 1965 when the Pension Fund of Technical Engineers was established. In 1990, Almenni Pension Fund VÍB (APVÍB) is established, merging with three funds in 1995, 1996 and 1997; the Pension Fund of the Tourist Guide Association, the Pension Fund of FÍH, and the Pension Fund of Employees of SÍF. In 1998 the Pension Fund of Technical Engineers and the Pension Fund of Architects merged and established the Pension Fund of Architects and Technical Engineers (PAT). A few years later, in 2003, APVÍB and PAT merged and established the Almenni Pension Fund. The last fund to merge with Almenni was the Pension Fund of Doctors in 2006. Almenni is open to all members that are able to choose their own pension fund, but also specializes in occupational funds for architects, engineers, musicians and tour guides (AL, 2017b).

The motives for the merger came from PAT, with the goal of becoming a larger, stronger and more cost efficient fund, as well as achieving efficiency and improved service through a larger scale than before (G. Baldvinsson, personal communication, April 7, 2017). Baldvinsson implied that the process of the merger and negotiation went rather well and didn't take very much time (personal communication, April 7, 2017). The pension rights of PAT increased about 12.6% due to the different gender ratio of the funds and to position the funds, LAT and APVÍB, equally (AL, 2003). At the end of 2003, the Almenni had 26.2 bn.kr and could be listed as a large pension fund and placed 8$^{th}$ and APVÍB had therefore doubled in size. Around this time, APVÍB used external management for asset management from Íslandsbanki hf but today Almenni manage everything internally.

In 2002, the total assets of APVÍB were 12.7 bn.kr, and it placed as the 15th largest fund. It is categorized as a medium-sized fund yet was very close to being a large fund. LAT was a medium-sized fund with 6.8 bn.kr of total assets, placing 23rd out of 51 funds. After the merger their total assets were 26.2 bn.kr. Their market share was 3.86% and they placed as the 8th largest fund. In 2015, Almenni was the 5th largest fund.

**Table 7:** Costs factors of the merged fund and its precursors.

| Funds | OC | AC | IC |
|---|---|---|---|
| **Almenni // 2003** | **0.27%** | **0.17%** | **0.10%** |
| APVÍB // 2002 | 0.35% | 0.23% | 0.12% |
| PAT // 2002 | 0.12% | 0.10% | 0.02% |

In Table 7, the OC, AC and IC are presented both before the merger as APVÍB and PAT and after the merger as Almenni. PAT had very low costs compared to APVÍB in both AC and IC. PAT was operating efficiently and seems to have increased its costs but APVÍB decreased it costs with the merger.

When comparing Almenni to the pension fund system in 2003, Almenni had lower cost percentage, as the system's OC was 0.31%. The second year was even better for Almenni with 0.23% of total assets and AC decreasing by 4%. The pension fund system had OC of 0.30%, and again Almenni had lower OC.

In order to find out if the merger was beneficial, a comparison of the estimated development with and without a merger (of PAT and APVÍB) is simulated in Figure 9. The estimation of the development of PAT and APVÍB will be placed in the medium group. In Figure 9, the blue line is the estimation of the OC of PAT and APVÍB if they wouldn't have merged and the red line is actual data of the OC from Almenni.

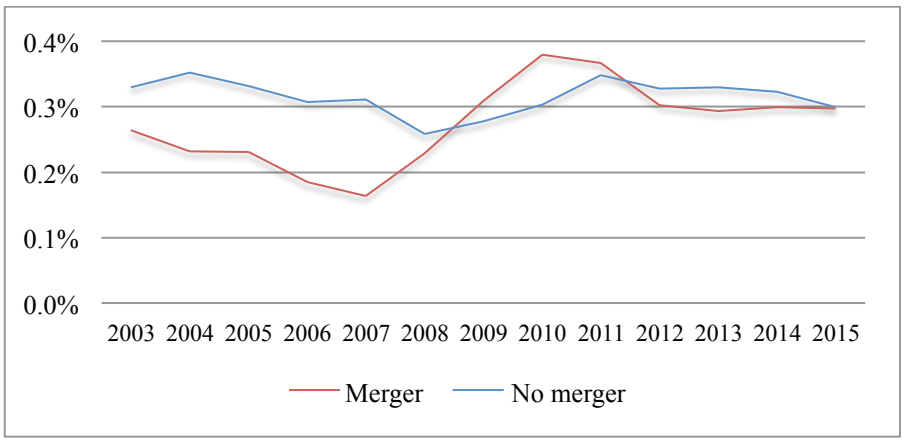


**Figure 9:** The operating costs as a percentage of total assets, both for the estimation with no merger and Almenni from 2003 to 2015.

The red line goes downward from the beginning until 2008 when the financial crisis occurred. The costs went extremely high in 2010 and since 2012 have stayed largely the same. It seems that Almenni hasn't been able to achieve the low cost percentages after the crisis. In recent years Almenni and the medium groups have been on a very similar path. Almenni's OC plan is to keep 0.30% of total assets (AL, 2016b), and have been achieving that goal for the past four years. Almenni is categorized as a large fund and the average of the large group has been quite lower than Almenni after 2008. This indicates that Almenni had not performed as cost efficiently as it should have. Figure 9 shows how the blue line has its lowest cost percentage of 0.26% in 2008 and now the medium funds have match the Almenni in 2015. Also, if PAT had maintained the same cost efficiency as it had previously, it is certain to say that the merger did not provide PAT with lower cost percentages. Therefore, in the long run the fund didn't achieve cost efficiency; nonetheless increased size brings other benefits. The results show that APVÍB attained cost benefits by merging with PAT. However, it is uncertain how PAT would have developed over the years following the merger, had the merger not been taken. But it seems that when the financial crisis occurred it hit many of the pension funds hard. Therefore, it is likely that PAT's increase in size, as a result of the merger, was helpful.

The estimated AC and OC of APVÍB through the years was very close to what the APVÍB had been achieving prior to the merger, but PAT was performing much better. As before the merger PAT had very low AC and IC compared to other funds in the same group size. Therefore, it is not really known if PAT would have increased their IC as much as calculated[6]. Although, with the merger APVÍB and PAT significantly enlarge, especially PAT and this strengthened the fund to its better (G. Baldvinsson, personal communication, April 7, 2017).

Even so, as the PAT had the initiative to merge it is obvious that they were not simply looking for cost efficiency, since they were already performing well in that area. It seems like they were responding to the environment at that time, as there were still many funds operating and a lot of discussion about mergers. This has not only provided a larger fund and a stronger one but also this has created the opportunity to hire professional personnel. Moreover, provide direct service and the assets have increased faster than the costs, thus the size has offered them better fees. Baldvinsson implies that the funds are without a doubt better off with the merger than they would have been without it since the environment has changed in the recent years after the crisis. With the merger the fund attained a certain size and have been growing since and are able to bare that costs regarding the requirements that are requested (G. Baldvinsson, personal communication, April 7, 2017).

[6] See Appendix 11 for figures and the year before the merger.

### 5.2.5 The General Pension Fund

The General Pension Fund (GP) was established September 26th 1974. The fund is intended for all employees and self-employed persons who are not members of other funds under the collective agreements. In 2010, four pension funds merged with the General Pension Fund at different times throughout the year. They were Skjöldur Pension Fund (Skjöldur), the Pension Fund of Employees of Glitnir Bank (PEG), the Pension Fund of the Icelandic Association Eimskip II (PE II) and the Pension Fund of Sláturfélags Suðurlands (PSS). They were all dwarf-sized funds expect for PEG which was a small fund. In 2012 a pension fund called Kjölur Pension Fund (Kjölur) merged with GP. Kjölur had been an operating pension fund since 2007, created out of a merger of five pension funds. These were the pension funds of Mjólkursamsalan, Icelandic Association Eimskip I, the Icelandic oil trade, flight mechanics and employees of fertilizer factories. Kjölur had been using external management from Landsbankinn for several years. All of the funds that merged with GP were closed funds; funds that were not taking on new members, a condition which made the consolidation much easier (S. Sigurbjörnsson, personal communication, April 5, 2017).

PE II were obligated to merge with GP in 2010 because of the PE II liquidation and by the pension law every fund that gets liquidation committee has to merge with GP. The main motive for the other three funds was security. The security entails that the funds are able to pay the obligated pension payments to their members. Because after the financial crisis in 2008, funds lost part of their assets and it created stress among the funds regarding the pension payouts. They wondered if they would have enough for pension payouts, and were unable to meet their requirements and obligations as a pension fund. Besides, this was relatively expensive to conduct all these requirements being a closed fund with external management as all of the funds were. The Icelandic banks collapsed in the financial crisis so there was a feeling of whether this was wise to continue the operation with the banks or to merge with a larger fund. GP proved to by a suitable alternative and the merger process went well for every fund (S. Sigurbjörnsson, personal communication, April 5, 2017).

In 2012, the motive for Kjölur wanting to merge with another fund was similar. Kjölur had glance at what funds was eligible and one of the funds was GP. The progress of the merger went well as the fund was closed. The process first involved knowing the values of Kjölur's asset and pension rights, then comparing their pension rights to GP's, and making certain modifications so they fit together. The merger process of Kjölur and GP, even though Kjölur had merged with five funds in 2007 they still had five different pension right plans and it took a longer time to

figure the plans all out and to match or change to one that was in GP (S. Sigurbjörnsson, personal communication, April 5, 2017).

In 2009, the total asset of PEG was 6.2 bn.kr, placing 24th of 37 funds, thus categorized as a small fund. PSS's total asset was 807,003 k.kr, placing at 31st, Skjöldur had 323,987 k.kr, placing at 34th and PE II had 87,303 k.kr, placing at 36th. These three funds were all in the dwarf size group. Before the merger, GP had 67.7 bn.kr total assets and placed as the 9th largest fund, and thus was categorized as a large fund. After the merger, GP continued to place 9th however with a 19.3% increase in assets. GP had 4.23% market share in 2010.

**Table 8:** Costs factors of the funds before the merger in 2009.

| Funds | OC | AC | IC |
|---|---|---|---|
| **GP** | **0.24%** | **0.15%** | **0.09%** |
| PEG | 0.50% | 0.32% | 0.19% |
| PSS | 0.54% | 0.53% | 0.01% |
| Skjöldur | 0.82% | 0.27% | 0.55% |
| PE II | 2.43% | 2.25% | 0.18% |

In Table 8, the OC, AC and IC from GP, PEG, PSS, Skjöldur and PE II are shown for the year 2009, before the merger. One can see the OC figures are relatively large, especially for PE II, where the AC is extremely high and this can be related to high board members' salaries. But GP managed to have good cost percentage.

After the merger, GP's OC was 0.27% with increased IC about 2% and 1% higher AC and compared to the pension fund system that year it had cost percentage of 0.23% which is lower than GP's. The OC went higher with the merger but the second year after the merger was better, as the OC was 0.24% with increased IC by 2% but 5% decrease in the AC. Comparing GP to the pension fund system the OC was 0.30% in 2011. The system had relatively high cost percentage compared to the previous years and that is related to the unusual tax that was forced on the pension funds by the government in that one year.

In 2011, Kjölur had total assets of 8.3 bn.kr and was categorized as a small fund. Kjölur's OC was 0.18%, with AC at 0.06% and IC at 0.12%. After the merger in 2012, total assets of GP had increased by about 23%, leaving them with a 5.2% market share. The development of GP from 2010-2015 is shown in Table 9. Again in the first year since the merger took place the OC is higher and the next year still better. In recent years, GP have been trying to keep the OC to a minimum and have never had to diminish the pension rights of members, and have committed themselves to continuing in this way (Söfnunarsjóður lífeyrissréttinda, 2016).

**Table 9:** Development of GP from 2010-2015. Numbers are shown in thousands ISK.

| GP | 2010 (1 small fund and 3 dwarfs funds merge) | 2011 | 2012 (1 small fund merge) | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| **Total asset** | 67,720,289 | 88,403,669 | 108,759,118 | 119,835,642 | 129,008,053 | 139,715,063 |
| **AC** | 103,953 | 96,455 | 129,015 | 94,992 | 119,907 | 120,335 |
| **IC** | 61,904 | 113,757 | 154,251 | 181,143 | 204,870 | 225,012 |
| **AC%** | 0.16% | 0.11% | 0.12% | 0.08% | 0.09% | 0.09% |
| **IC%** | 0.11% | 0.13% | 0.14% | 0.15% | 0.16% | 0.16% |
| **Total OC%** | **0.27%** | **0.24%** | **0.26%** | **0.23%** | **0.25%** | **0.25%** |

There is no doubt that the 2010 merger was beneficial for the funds that merged with GP as the funds would likely have the similar cost percentage as before the merger[7]. Hence, achieved cost efficiency and the consolidation with a larger fund provided financial security. Kjölur seems to have had very good cost efficiency prior to the merger, but gained other benefits with the merger. Moreover, Sigurbjörnsson implies that the funds that merged with GP gained economies of scale and became stronger and more efficient. If the funds had remained the same, they would have been nervous about if their pension payments would serve for all members. Therefore, the merger helped the funds to avert that risk and ensure pension payments for their pension members as well other costs disappeared and decreased with the scale. Even though Kjölur was run very efficiently, there is always a cost that disappears with the merger like certain operating management costs and together the funds are only paying one fixed fee to FSA instead of five. Besides, GP has internal management and before the merger the small funds and the dwarfs all had external management. The consolidation with GP, gave the pension members of the funds more direct communication and service. The benefits that GP achieved by consolidating with the funds included expanding the asset size and therefore being able to attain a more efficient unit. Yet, there are certain charges that increase with size, e.g. supervision fees and audit. But the basic operation did not increase with the merger but stayed the same. Even so, the merger process increased the workload during the merger (S. Sigurbjörnsson, personal communication, April 5, 2017).

### 5.2.6 Brú Pension Fund

Brú Pension fund was founded July 28th in 1998 by contracts on behalf of several labor unions (BHM, BSRB and Icelandic Teachers' Union) and Association of Icelandic Municipalities. Previously, it had been called the Pension Fund of Municipality Employees, but in June 2016 they changed their name to Brú Pension Fund. The fund was established for people that worked

[7] See Appendix 12 for OC estimation for the small funds compared to GP.

in local municipalities and the current municipalities pension funds were closed at the same time for the new members. Then in 2013, five pension funds of closed municipality funds merged with a section that is called the B-section (G. Guðjónsdóttir, personal communication, March 31, 2017). The structure of the Brú pension fund is divided into three sections, they are A- and V-section and B-section. The A-section is only for members of the labor unions mentioned above and has another pension rights than the other sections. The premiums paid by the employer are predetermined and can be variable and raised to that extent needed. V-section has comparable rights like most of the funds in Iceland, have no employer guarantee and is open for all members. B-section is for the closed municipality funds because they have different pension. Therefore a collection of pension rights from the closed pension funds and every fund has their employer guarantee from their own municipalities (Brú Pension fund, 2017).

In 2013, five municipalities pension funds merged with Brú Pension Fund. They were pension funds for employees of Hafnarfjörður (PHFJ), Akranes (PAK), Húsavík (PHV), Neskaupstaður (PNK) and Vestmannaeyjar (PVE). Before the merger in 2013, Brú Pension Fund operated all of these funds except the Pension Fund for Employees of Vestmannaeyjar. The merger agreement entailed to hold the pension rights of each fund and kept separated until the last pension members receive pension payouts. The pension rights were defined under the B-section. The motives for the merger came from Brú: since they were operating most of these funds, the usage of staff was not efficient because they were always working on a reports, attending many boards meetings, creating reports for each of the fund as well annual reports and having inner audit committee for each fund. Before the merger, Brú had to do five instead of one report and along with the increased requirements from regulators and having so small funds it can be hard to keep on track. Therefore the work among the staff was not as efficient as it should have been (G. Guðjónsdóttir, personal communication, March 31, 2017).

Brú Pension Fund also operate the Pension Fund for Employees of Reykjavik City from 1999 and the Pension Fund for Employees of Kópavogur town from 2010, both closed funds. When the other funds were merging with Brú, these funds were offered the chance to merge as well. But Kópavogur and Reykjavík wanted to remain on their own, a choice which is perhaps related to their rural focus and lack of political incentives (G. Guðjónsdóttir, personal communication, March 31, 2017).

The merger of the five funds to Brú was a great step forward in making things simpler in Brú. The number of boards meetings and reports were greatly reduced as well the other important factors related to operating a single fund. This gave time and opportunity to increase the

efficiency of the staff and improve procedures. Since then Brú has focused on improving the quality, inner procedures and make a future strategy as before everybody was focusing on keeping the fund going and finish all of the tasks. Furthermore, Guðjónsdóttir implies that Brú has performed better since the merger, as the amalgamated fund has strengthened the governance, and changed their external management to internal management. Before, many tasks were outsourced because the employees were busy with other tasks. Therefore, changing their management and having the knowledge inside the fund by having the specialized staff does help to take informed and accurate decisions. The costs haven't decreased as much because of this changes and it can take time. The merger was also a great way for the fund to improve the service to their members (G. Guðjónsdóttir, personal communication, March 31, 2017).

Before the merger, the total assets of Brú were 73.8 bn.kr, placing the fund as the 11$^{th}$ largest. At that time it was categorized as a medium fund, but not far from being defined as large. The total assets of the five municipalities funds were 4.1 bn.kr and these funds were all in the group dwarfs. Placed in the last places 27$^{th}$ – 30$^{th}$. This was divided to PHFJ with 1,973,613 k.kr, PAK 994,139 k.kr, PHK 606,384 k.kr, PNK 491,495 k.kr and PVE 75,548 k.kr. After the merger the total asset of Brú had increased about 24.22%, still placed the same, yet now located in the large funds group as the difference between the next fund got smaller but the next below larger.

In Table 10, the OC, AC and IC for the funds mention above and Brú are presented for the year 2012, before the merger. The OC average from these five dwarfs funds is 2.5%.

**Table 10:** Costs factors of the funds before the merger in 2012.

| Dwarfs | OC | AC | IC |
|---|---|---|---|
| **Brú** | **0.33%** | **0.14%** | **0.19%** |
| **PHFJ** | 1.87% | 1.11% | 0.76% |
| **PAK** | 1.69% | 0.92% | 0.77% |
| **PHK** | 1.52% | 0.86% | 0.66% |
| **PNK** | 1.86% | 1.00% | 0.86% |
| **PVE** | 5.58% | 5.58% | 0% |

The AC is always higher than the IC for these funds. These are the highest costs numbers that have been seen throughout the analysis. These funds both have really high AC and IC. Even though they had external management with a medium-sized fund, there was no sign of achieving economies of scale through operating with another fund. Brú on the other hand has costs numbers that are the same as the average medium-sized fund that year.

After the merger, Brú had costs of 0.37% of total assets in 2013, with IC increasing by 5%. The OC of the pension fund system was 0.23% in 2013 and Brú was much higher than the system. The second year was better with OC of 0.32% for Brú. The OC of the whole pension

fund system was 0.22%, even so with improvement, Brú were still 10% higher than the system. Guðjónsdóttir mentioned that Brú is and have been going through some changes to strengthen their asset management, service, procedures and other tasks so in the upcoming years the costs should be stable. Also, in the long run the fund aims to generate to lower costs and efficiency (personal communication, March 31, 2017).

Through the years 2011 to 2015, funds in the dwarf size group had reduced each year and in 2013 there were only six funds left. Therefore, in 2013 it is possible to say the dwarf size group was eliminated following this merger in 2013 (there is only one closed fund left that is the only fund that does not take any contributions, the fund is only paying pension payments to members). But the consolidation with the dwarfs and Brú did indeed lower the costs for the dwarfs as the wages of the board members, housing costs, auditing etc. Table 11 shows the developments of Brú from 2011 to 2015. One can see that in 2011 the OC was really high and this can be related to the fact that Brú outsourced everything that was possible, but from 2011 onward Brú was moving from external to internal management and today they have only one agency agreement instead of five, as they had before (G. Guðjónsdóttir, personal communication, March 31, 2017). Nonetheless, in each consecutive year the IC is always higher than the AC.

**Table 11:** Development of Brú from 2011-2015. Numbers are shown in thousands ISK.

| Brú | 2011 | 2012 | 2013 (5 dwarfs funds merge) | 2014 | 2015 |
|---|---|---|---|---|---|
| **Total asset** | 58,467,092 | 73,824,436 | 86,557,244 | 98,166,555 | 114,421,736 |
| **AC** | 153,265 | 96,612 | 106,822 | 132,973 | 167,569 |
| **IC** | 168,588 | 132,245 | 210,900 | 185,422 | 222,844 |
| **AC%** | 0.26% | 0.13% | 0.12% | 0.14% | 0.15% |
| **IC%** | 0.29% | 0.18% | 0.24% | 0.19% | 0.19% |
| **Total OC%** | **0.55%** | **0.31%** | **0.37%** | **0.32%** | **0.34%** |

Brú benefitted as becoming a larger fund than before, there was more time to focus on another tasks as the transaction costs decreased a lot but still having the same number of staff. All of the dwarfs have employer guarantee and therefore they didn't need to attain financial security but the amalgamated fund is more capable of fulfilling its requirements as a pension fund. The dwarfs were too small to handle all of these reports and demands and this was expensive for them. Guðjónsdóttir implies that there is always a fixed fee for the supervisory, audit etc. and thus by merging these costs all came together in one, instead of consisting of five fixed fees (G. Guðjónsdóttir, personal communication, March 31, 2017).

## 5.3 The number of pension funds

When the respondents were asked about why there hasn't been more consolidation they all agreed that the number of pension funds has reduced a lot. Moreover, many of them mention that consolidation can take time, the funds have different pension rights plans, which can complicate things, but the mergers seem to have occurred on its on pace. As Pension fund F mentioned, sometimes having the right conditions and the right moment are essential when consolidating. Pension fund B mentioned that perhaps there were still some rich rural focus around some funds, because these funds would sometimes invest in local business that nobody else were investing in. Maybe some board members were afraid to lose their board seat and perhaps felt that they would lose control of the fund if they took part in a merger process. Pension fund A talked about how banks offering external management to small funds have reduced the need for consolidation, thus slowing down Iceland's merging process.

The number of funds is still high today, to which the respondents agreed, adding that there should be more of the medium and small fund mergers. Pension funds A and F said that there were still enough opportunities for consolidation and to attain economies of scale. The reason why this may be happening at a slower rate than it could is that the economic crisis may have prevented more consolidation. In 2008 when the crisis occurred, the pension funds had to face severe uncertainty about their assets and were busy dealing with the consequences. Yet, today all certain issues regarding the crisis have come to an end for most of the funds. Therefore it is now an opportunity for further consolidation in the system.

The Icelandic population is about 340.000 people and by having such high number of funds, the members are paying high OC more than perhaps should be. Therefore, the system is expensive to that extent because there is perhaps a chance to perform better. Most of the respondents agreed and Company G implied that the costs in the system will remain high while there are still so many funds. Company C said that the pension fund system is a co-operative team and should focus on having as efficient operations and as low costs as possible. Companies A and F argued that even though Iceland has a relatively large number of funds, the system still manages to have low costs compared to other countries.

It is certain that the number of funds will decrease in the coming years, and that many opportunities exist for further consolidation. All of the respondents were in agreement that the number of funds has to have a certain limit but still have some range of funds to ensure effective competition and risk diversification. The suggested future number of pension funds that would be in the system varied between respondents. Pension funds A and B talked about five to seven

funds on the general market and perhaps two public funds. Pension funds D and F talked about five to ten pension funds. Pension funds E and G agreed that ten pension funds were the maximum number but Pension fund D thought there should be around ten to fifteen funds.

All respondents reported that having only one fund with employer guarantee was a really bad idea as it is important to have competition. Pension funds B and D explained that having too few individuals invest and manage all of the assets in the Icelandic pension system is rather unfortunate and no one should be in that position. Pension funds A, B and C add that the development of the employer guarantee by the government and municipalities will discontinue in the future and the recent increase in premium in some funds in the private sector is to match the public sector is a good step to synchronize better between funds. As all of the funds with guarantee from the government and municipalities closed in 1997, it is remains of the old pension system and will end after certain time. It seems that all the pension members will be have comparable pension rights in the future and that should be the right growth to better pension system.

### 5.3.1 The small funds

Most of the Icelandic pension funds have a support base, the social partners as the working unions, employee associations and under the old system it was possible to say that there was a separate pension fund for nearly every union or occupation, when the number of pension funds was at its maximum. Today it seems that there are potential traces of this in the pension system and perhaps might still interfere with consolidation between funds. Pension fund E pointed out that those unions could have both positive and negative effects. Sometimes pension funds are influenced from the unions as they have certain points of view of things and don't want to merge with others as they see themselves as advantage as being alone. Pension fund C and F thought that every fund has its past and existence and this is part of the old system and to unwind this can possible take some time. Pension fund B suggested because in general, some funds are connected to unions, the unions are therefore able to have certain number of board members and perhaps they don't want to lose their seat with consolidation with another fund. Pension fund C suggested that perhaps politics are the reason why those small funds haven't merged specially associated with the pension funds of communities. However, Pension fund A was not sure that the unions had effect on the possible consolidation if looked at the 10 smallest pension fund. It was perhaps another reasons, possibly because they have external management and haven't really thought about consolidation, he suggested.

As mentioned before, opportunities exist for the small funds to merge but they haven't. Pension fund A explained that nine of the funds have fewer than 800 contributing members which is against the law, but six of them have employer guarantee thus don't follow under this legal provision. The others have to make an insurance agreement with one of the financial institutions and then they are able to operate as long as they can. This insurance agreement entails to diversify the responsibility of pension rights and be sure that they will be able to pay pension to their members. Pension funds B and F added that previous merger negations between medium and small funds that have taken place have failed. Pension fund B wondered when Festa Pension Fund that was established by two large funds merging that the Pension Fund of Rangá and the Pension Fund of Vestmannaeyjar didn't merge too. Pension fund B implies that they were great candidate for the merger as well. Moreover, the Pension Fund of Farmers was in merger negotiations with GP, but the merger did not succeed. Pension fund C suggested that certain status of the funds, their location, the connection to their support base and whether the management is outsourced or not can all be a possible reason for not consolidating with another fund. But adds, that many of the funds are positive towards mergers and could happen in future years but likely this can take time.

## 5.4 Comparison with the four Nordic pension funds

Here a comparison will be made between with Iceland and other Nordic countries; Denmark, Finland and Norway. The goal is to see where Iceland stands compared to these other countries, and therefore gain a more international perspective. The factors that will be analyzed are the structure of the pension system, total assets, OC, number of funds, asset allocation and real returns.

### 5.4.1 The three Nordic pension fund systems

The system is fundamental and varies between countries. Therefore it is important to give a short overview of the systems from Denmark, Norway and Finland before certain factors will be presented and analyzed.

*Denmark:* The normal pension age is currently 65 years but will be increased to 67 years in 2022 and 68 in 2030. The pension system is based on the three pillars proposed from the World Bank. The first pillar is a social security scheme, which has mandatory membership for all Danish citizens. This provides minimum basic pension (FP) for all citizens and is equivalent to about 17% of average earnings. Besides, the Danes have another premium system that is statutory (ATP) which are for the working people with 1% premium of their salaries and also a fixed annual fee (1/3 employees, 2/3 employer). Full pension is payable after 40 years.

The minimum basic pension is based on PAYG system but ATP is based on fund accumulation and DC. Old-age pension as well other benefits are largely financed by general government revenue and as a result, there is a large burden on the Danish government to pay pensions. The second pillar is based on mandatory fully funded and defined contribution. Generally, members are required to pay in occupational funds but some pay in custodial accounts. Premiums of total salaries are divided between 1/3 that employees pay and 2/3 that employers pay but premiums are normally between 12-18%. Generally, low rates apply to low income and low education groups, and vice versa. This entails that pension rights with ATP and with the occupational pension system are based on the longer the working career, the higher employment rate, the longer contribution and the higher contribution level can result in greater the pensions benefit. The third pillar is voluntary pension savings; members can have custodial accounts through banks, pension funds or insurance companies (OECD, 2015; Baldvinsson, 2004). The second pillar is similar to the Icelandic; the main difference is that in Denmark self-employed workers are not covered by the second pillar and only 75% of private sector workers are enrolled (OECD, 2015).

*Norway:* The normal pension age is 67 years. The system is based on the three pillars. The first pillar is built upon a new public pension system from 2011, providing a minimum basic pension equivalent to about 31% of average earnings (The National Insurance of Norway). For each year of employment, 18.1% of wages are transferred to a pension account and the pension entitlements are increased each year in line with wage growth. In 2006, a mandatory occupational pension was introduced in the private sector, as a supplement to the public pension, forming the second pillar. This pension is mandatory under specific conditions regarding number of employees and working hours. All employers are required to set up a pension plan for their employees and there are two types of plans. The types are DC whereas employers have minimum contribution of 2% of salary and the employees can choose their own pension profile. But if the employer offers a DB instead, the benefits must not be under the expected benefits as the mandatory contribution and is normally 66% of the salary with the sum from the National Insurance Pension. The third pillar is voluntary private pension where people may save for a voluntary pension to top up the public pension and work-related pension schemes. The Norwegian private pension market is a small market, funded and dominated by insurance contracts/companies (OECD, 2015; DNB, 2017).

*Finland:* The normal pension age is 65 years. The system is based on the three pillars. The first pillar is a social security (the National Pension) scheme and has mandatory membership from 16 years of age. Full pension is payable after 40 years. Premiums for the

employer are about 5.55% to 7.05% of salaries and are based on the PAYG system; thus financed by taxes. The social security system pays minimum old-age pension to retired citizens that don't receive or get low pensions from occupational funds. The pension payments are from 20-24% of average wages. The second pillar is mandatory occupational funds, and is based on defined benefits, but their operations are often taken care of by insurance companies. The system is based partially on PAYG and partly on funding accumulation. Employers pay on average 16.7% and employees 4.4% and there is no ceiling on premiums. The third pillar is voluntary pension savings, and these are operated through life insurance companies (OECD, 2015; Baldvinsson, 2004).

In Figure 10, the total assets for each of the pension fund system is presented in Icelandic currency. The Icelandic and Norwegian pension systems are similar in size. The Danish one is the largest of these systems and nearly four times larger than the Icelandic system.

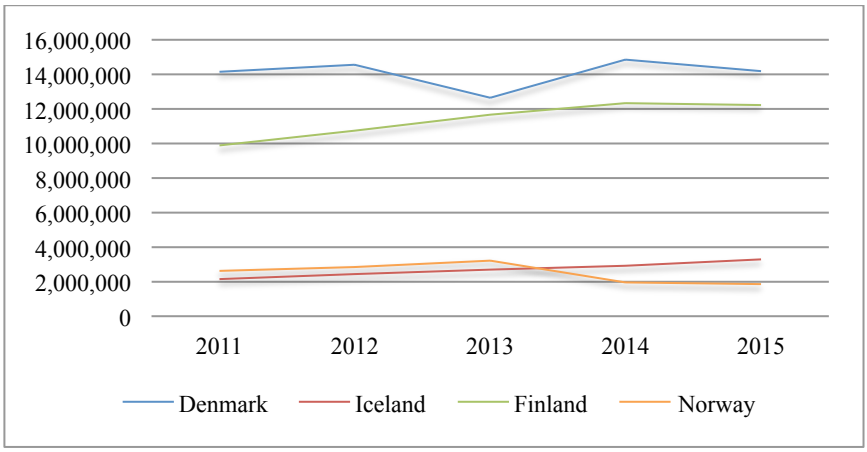


**Figure 10:** Total assets of pension funds of four Nordic countries in millions calculated in ISK for 2015.[8] Exchange rate based on April 12, 2017. Source: OECD and author calculations.

What is noteworthy is that Denmark, Norway and Finland all have around 5 million inhabitants but Iceland has only about 340.000 and by dividing the habitants to the pension system assets shows that Iceland has 9.94 times the size of the inhabitants but Denmark has 2.50, Finland 2.22 and Norway 0.36. Which shows how large the Icelandic pension system really is compared to Iceland's population size. This can be related to the fact that the Icelandic system is built upon a large part of fund accumulation and very small portion of taxes funds the system compared to the other countries.

[8] See total assets in national currency in Appendix 13.

### 5.4.2 Operating cost and number of pension funds

The total OC in relation to total assets varies considerably between countries across the world, going from 0.1% to 1.3% and the four Nordic countries are well efficient compared to other countries in the world (OECD, 2015). In Figure 11, one can see the OC for the four Nordic counties. Denmark has the lowest cost percentages through the years while Finland was able to lower the costs by 0.6% in only one year and has been cost efficient since then. Iceland reduced the costs by 0.1% from 2011; this could be related to the unusual tax that was laid on the pension funds in that particular year. Norway has the highest cost percentages through the years.

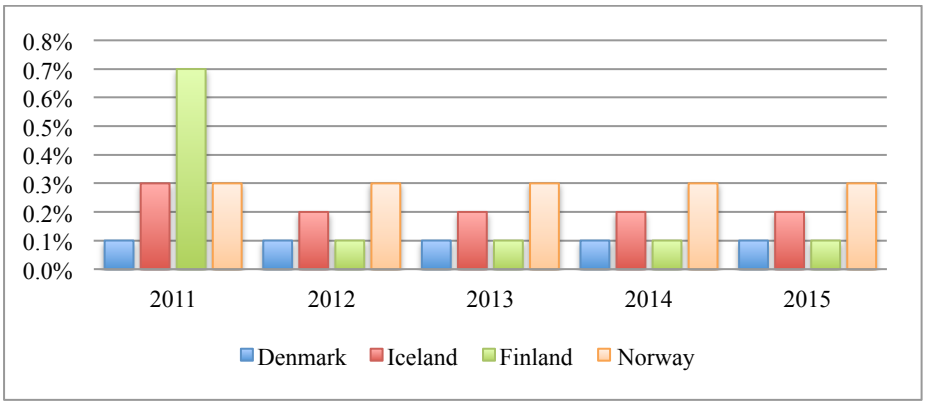


**Figure 11:** Pension funds' OC as a percentage of total assets, 2011-2015. Source: OECD statistical.

The number of pension funds in each country in the world varies from a few to thousands (OECD, 2016a). Numbers of pension funds are low in central Europe and Eastern Europe and it is possible to say that the Nordic countries also have relatively few. From 2005 the number of pension funds in Denmark, Iceland and Norway has decreased by 62% together. In 2015, Norway had the highest number of pension funds, at around 87, and Denmark the lowest with 20 funds. 10 years earlier, in 2005, there were 119 funds in Norway and 50 in Denmark while Iceland had 46, the lowest number of funds then (OECD, 2016a).

### 5.4.3 Asset allocation and real return

With increased assets over the years, pension funds are able to invest more than before. The four countries have different asset allocation when analyzed from 2011 to 2015.[9] Yet, it is possible to say that Iceland and Finland have somewhat similar allocations, as do Norway and Denmark. The biggest difference between the four countries is that Denmark has a very low percentage of cash and deposits compared to the others but all of them have very low percentage in this asset class. Norway and Finland have the highest average proportion of equities: 34-36%, Iceland 27% and Denmark has 15%. All of them invest most in bonds and

[9] See Appendix 14 for figures for asset allocation for each country.

bills: Denmark has on average 65% through the years, then Norway with 58.3%, Iceland with 51% and Finland with 31%. This is interesting to see because Denmark and Finland have larger asset classes compared to Iceland and Norway. Even so, it seems that the countries are following their own investment policy according to what they think best at each time. Yet, the investment performance of the pension funds was probably driven by developments in the equity and bond markets as the pension funds directed most of their investments towards these two asset classes.

After looking at the countries asset allocation it is important to look at the real returns. In Figure 12, one can see the real returns from the pension fund system in each country from the year 2011 to 2015. The blue line is Denmark, the red line is Iceland, the green line is Finland and the orange line is Norway.

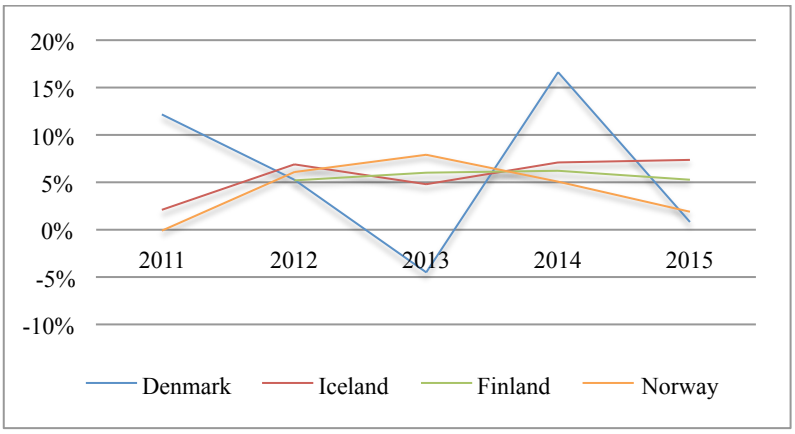


**Figure 12:** Pension funds' real net rate of investment returns, 2011-2015. Source: OECD.

Denmark has very variable returns, going from positive to negative and then back to a very good return, and then the next year close to 0%. Rather unstable returns. However, Iceland, Norway and Finland are shown to have rather stable and positive return, mostly following a similar pattern. In 2011, Denmark had good positive return but the others were very close to 0% and in 2015 all of the returns were lower than in 2014 except for Iceland's. Denmark has the highest 5-year average with 6.08%, next is Iceland with 5.66%, Finland with 4.54% and Norway with 4.18%. It seems that Denmark has very different assets allocation compared to the other and can be related to the fact of the proportion of how much is domestic and how much is foreign. Besides, each country's domestic market can have effect as well. This is interesting because the asset allocation showed no large difference and if the countries all had very similar asset allocation, they would or should have shown similar returns.

This comparison from the period 2011-2015 indicates that the Danish pension system is the largest in size, has the lowest costs and the lowest number of funds, with the best returns. Overall, Denmark performs the best, which essentially suggests that their system is efficient and their reduction in number of pension funds over the years indicates consolidation or that funds have closed down. It is obvious that the four countries have a strong system that has made good use of the advantages of economies of scale. Finland is the second largest with the same cost percentage as Denmark but with the second lowest return. Iceland has the third largest asset size, despite its small population compared to the others. Iceland has the second lowest cost percentage, second lowest number of funds after Demark and second highest return. Norway is at the bottom, with the lowest assets, highest cost percentage, most funds and the lowest return. However, interestingly, Icelandic funds have been operating under strict capital controls for many years while the others have not, but still manages to perform well regarding both costs and real returns.

# 6 Discussion and results

In this chapter a discussion is reached by matching prior findings and theories in the field that have been presented together with the collected data and analysis to answer the research questions and draw the following results.

## 6.1 Size does matter in relation to costs and real returns

The literature has revealed that cost decreases relative to funds enlarging. The study findings present the same, indicating that the scale does matter in relation to costs. As the giants have the lowest percentage costs on average by 0.10% to the next asset class and then the difference between the next asset classes to another diminishes. The group of dwarfs has the most expensive costs and together they are ten times smaller than the largest fund. This is consistent with Bikker and de Dreu's (2013) study as it revealed that the OC increases as the fund have more pensioners and rather fairly active participants. The funds that are most expensive are the closed funds or that have very few active members. Costs have a big impact on the size of the pension benefits and therefore it should be a motive for the medium and small funds to merge as it offers great potential for cost efficiency and moreover, provides the security to meet funding requirements and improve future pension benefits.

The literature revealed that sometimes larger pension funds are not able to transfer their lower investment costs into higher net returns, which results in diseconomies of scale (Bauer et al., 2010). Scale is not a guarantee of good performance if the fund lacks the right governance (Ambachtsheer, 2016). In this study, it is not possible to assert that large funds achieve higher returns than the small funds since the results show that small pension funds were able to place with the second highest average return; giants had the best returns but large funds placed last. It is, however, unknown whether the large funds governance was badly managed, but there is potential evidence to suggest that they lack more specialized management as other seems to have accomplish. This is consistent with Sturluson & Herbertson's (1996) prior research and gives the same result nearly 20 years later. There is evidence of small funds achieving advantages of scale through their external management at a much larger unit. This can be the reason why the small funds haven't consolidated as much.

The result of the analysis suggests that the small funds are too small to meet the requirements of a pension fund. Besides, some large funds are not achieving the advantages of scale; some of the costs are still relatively high compared to the giants. Also, *bigger is better* does not necessarily apply because the funds need to reach their optimal sizes that are able to meet its

entire obligation in an efficient way. If a fund is too large, operations become too large to handle, resulting in diseconomies of scale.

Yet, the results suggest that the giants seem to have reached the optimal size and have attained the advantages of scale both regarding the lowest costs and highest return. There are great cost differences across asset sizes, but not as significant as the differences between returns. There are many small funds and despite the fact that the real return does not increase in proportion to the size of funds as the costs does, it is shown that fund members are best served by increased efficiency in operations.

## 6.2 One of the merger's motives is to seek economies of scale

The literature revealed that main motives for pension fund mergers were to become larger, minimize costs and attain the unused economies of scale (Engelen, 2003; Barros & Garcia, 2006). The theories regarding merger motives that implies with the findings are both efficiency theory and somewhat empire-building theory (Trautwein, 1990). The findings show that most of the time a merger is an attempt to achieve economies of scale, particularly in the case of the small funds that have difficulties in meeting funding requirements. This is consistent with the efficiency theory as it is planned to achieve financial, operational and managerial synergies. Yet, there is also evidence of other motives such as obtaining the advantages of economies of scale, becoming stronger, being able to offer better pension benefits and stronger position on the market can be related to the empire-building theory. Besides, by being larger the amalgamated fund is or should be able to have more specialized personnel, providing stronger management on the terms of investments and risk. Besides, as the fund became larger the were more offers of investment options on their table and better terms of trade, therefore, a lower IC. But the results from the mergers with the small funds and the dwarfs showed another strong incentives to merge. Especially after the financial crisis, the funds saw that they wouldn't be able to meet their promised pension payments and their obligations as pension funds. Because the funds were closed, there was no option open to them other than to consolidate and receive security from another fund, as it was not possible for them to take on new members. There was also evidence of one medium-sized fund operating dwarf funds. This provided a motive to merge to decrease the workload and thereby save on costs. This would turn the amalgamated fund into one efficient unit in the long run.

Mergers can be formed in two different ways: either from the merging of two or more funds which are very similar, or the merging of two or more funds which are very different. If they are different it is important that after the merger each fund involved is able to become stronger in

the areas that were previously weak. It is not uncommon for merger negotiations to be unsuccessful, and mergers often do not take place at all if the funds were unable to reach a good settlement. In order for the funds that are about to merge to get the most benefits, it is good when the strength of the funds are concentrated into different areas. Choosing the right fund to consolidate with, allows the amalgamated fund to maximize the benefits that can be achieved by merging.

The merger analysis suggests that after consolidation, the funds were able to cope better with the changes that occur in the pension system or in the financial markets. Also, as presented in the findings, some funds had greater cost efficiency before the merger or the same or higher cost percentage after the merger but the funds seemed to be willing to take that risk, as other benefits of economies of scale outweighed the cost disadvantages in the long run. It also seems that the mergers of Gildi, Stapi & Almenni provided a better and stronger fund to take on the economy crisis. The funds were well prepared and perhaps would have experienced difficulties after the crisis both regarding funding requirements and operation requirements, if they hadn't merged. The theory of the advantages of scale are presented in the literature review and the result of this study with the scale and the mergers showed that advantages of scale that the funds achieved were managerial economies that provided the fund to hire more specialized staff. Moreover, financial economies were the costs and fee was lower, more investment options and the funds were able to improve and provide personal service. Yet, the disadvantages of scale that was found, was that larger funds with large asset class have low response level regarding changes in the market compared to the small funds.

Additionally, the exact nature of the economies of scale that was found was lower costs, higher real returns in the long run and better access to investment options, able to hire more professional personnel with more specific knowledge and expertise, able to provide better service and able to fulfill all the requirements imposed on pension fund. Moreover, the consolidation is efficient for the whole pension system, as the system becomes more sustainable. In the nearest future, investment abroad can be expected to increase considerably, and economies of scale will depend greatly on how individual fund will manage. At the same time, it is likely that there will be a considerable amount of consolidation of pension funds as the remaining medium and small funds are many.

## 6.3 Opportunity for further merging and a more efficient system

Competition leads funds to compete for the best performance both on costs and real returns, and it keeps the funds on edge. If there are too few funds on the market it can limit the competition.

Therefore, having only one existing fund in the pension system would eliminate the competition and the findings showed that would be very inefficient. Nevertheless, one could argue that if there really was a competition on the current market as the members are mandatory obligated to pay premiums to certain pension but if it wouldn't be mandatory and the members could choose their own pension fund, then possibly there would be much greater competition on the market. It appears the competition is only between the funds, without having them to try to get new members.

This study implies that the Icelandic pension system has a lot of opportunities to be more efficient and needs numerous of its funds to attain economies of scale. There are too many small funds; more funds need to consolidate to obtain the optimal size as the giants seem to have or at least close to their size. There is, then, opportunity for at least 15-17 funds to consolidate, to form around seven to nine funds. Additionally, their assets are always increasing and it is important for them to have good governance, management and efficient operations because their main goal is to provide the best pension benefits at each time for the generations. With that in mind, the medium and small funds should without a doubt and no later start merger negations. In the nearest future all of the medium and small funds should keep an open and positive mind with regard to merger negotiations and build up good and strong funds and be large in size to attain most of the advantages of economies of scale.

Based on the above, the government has to intervene in the near future and change the regulation in relation to the minimum size of an Icelandic pension fund. The argument is based on the fact that the mandatory premiums to a special fund are linked mostly to a collective agreement in the individual work. It is therefore a need for the pension funds to be similar and efficient as possible to provide all Icelanders the same pension benefits. Not all of the people would be happy to pay mandatory premiums to small funds that are operating badly both regarding costs and returns. Hence, the minimum size would indicate a least 10.000 contributing members instead of 800 as it is today. This may have to take place in smaller steps. After the author's interpretations of Appendix 15 it is suggested that the cost percentage as a benchmark should be 0.40%. Hopefully, these actions will put pressure on the medium and small funds to merge and be efficient units. This would also have the benefit of making the funds similar in size.

The Icelandic pension system performs well compared to those other four Nordic countries studied, and the four countries seem to be built upon the same foundation, and yet differ in many ways. All of the countries except Iceland can have pension funds managed through

insurance companies. Yet, there is one factor that strengthens the Icelandic system: government expenditure on pension funds is the lowest compared to the other three Nordic countries. Even though the Icelandic system is large compared to Iceland's population size, it is small compared to the Danish and Finland systems. Nevertheless, the Icelandic system is not less managed than the others to have low costs and good returns and shows that even with the size different Iceland manage to perform well.

## 6.4 Limitations

Pension funds are long-term investors, which gives them the opportunity to look at a long-term selection of investment options. Experience has shown that the funds are compensated with higher returns that can accept price fluctuations. It can be hard to gain the right perspective on each real return since many factors can be influenced by it, it's different between funds investment policy where they are in the process, trying new investments etc. Therefore, more analysis needs to be done to investigate each examined fund's performance that was done is this study. The main limitation of this study may lie in the 5 year period that gives perhaps no look at the transitions and reactions to the macroeconomic environment and should therefore to gain more historical perspective a longer period.

There could also be a potential limitation in the methodology of comparing the precursor fund and amalgamated fund. The estimation of the costs from the each group size may have the limitation because the fund may perhaps not act the same way as the group did.

The qualification of the interviewer could also have impacted the study. This is considered to be a limitation because there could be potential biases and expectations when the author asked questions and followed up on replies. Besides, maintaining focus in the interviews on that the answers were fully answered in the connection to the research topic. Furthermore, the seven interviews conducted on the study were all made in Icelandic. This can be seen as a limitation because the results have to be coded and categorized into themes in English.

The thesis is based upon the Icelandic pension fund system, which means that the study is focused on Icelandic conditions concerning markets, legislation, governance etc. Therefore, carefulness in generalizing the findings beyond the scope of the study is an essential factor in this case. The method is a combination of primary and secondary data and as well interviews with the use of few variables with small number of units. Thus the possibility of generalization is low.

# 7 Conclusion

The scope of this thesis was to investigate and analyze the characteristics of economies of scale in pension funds. Hence, to investigate whether the size of pension funds matters when it comes to costs and performance, to examine previous mergers of pension funds in order to observe whether it was efficient for the funds to merge, as well to investigate whether economies of scale were observed. Finally, aimed to give a more international perspective on the subject by comparing Iceland's pension system with those of three other Nordic countries.

According to this study it appears that economies of scale are achieved by the giants group, which has the largest funds asset class both in costs and returns, while small funds achieve some economies of scale through external management. The study showed that mergers are beneficial and their motives are most of the times to seek the advantages of economies of scale. There are a lot of potential consolidations of funds, especially regarding the medium and small funds; in the long run they are likely to have increasing costs and experience difficulties in meeting funding requirements, if they are not already experiencing these difficulties. In members favor, it is a need to consolidate and create even more efficient pension funds with long-term thinking to further develop Iceland's advanced pension system. The Icelandic system is similar in costs and real returns as the Nordic countries but the study showed that the Icelandic system has a lot of potential to become lower in number of funds and create more efficient units in the nearest future by using the unused economies of scale.

The findings are in accordance with the results the author initially predicted, although, the author is surprised by how many small and medium funds were not able to achieve cost efficiency and other advantages of economies of scale. Therefore, this thesis debates that small and medium funds should consolidate.

## 7.1 Suggestions for further research

The author assumes that the last economic collapse plays a role in motivating small pension funds to consider merging. The funds, which had recently gone through mergers when the economic collapse took place in 2008 proved to be capable to meet new requirements and cope with the new reality. Therefore, a further investigation would be relevant to further explore the influence economic collapse on future strategy among pension funds. This study suggests that the optimal size for Icelandic pension funds is to be a giant. This way the funds achieve the advantages that come with the measured economies of scale. Further investigation for each of the Icelandic pension funds on what advantages of scale they are currently achieving would lead to conclusion on what kinds of a pension funds are optimal regarding size, structure and governance etc.

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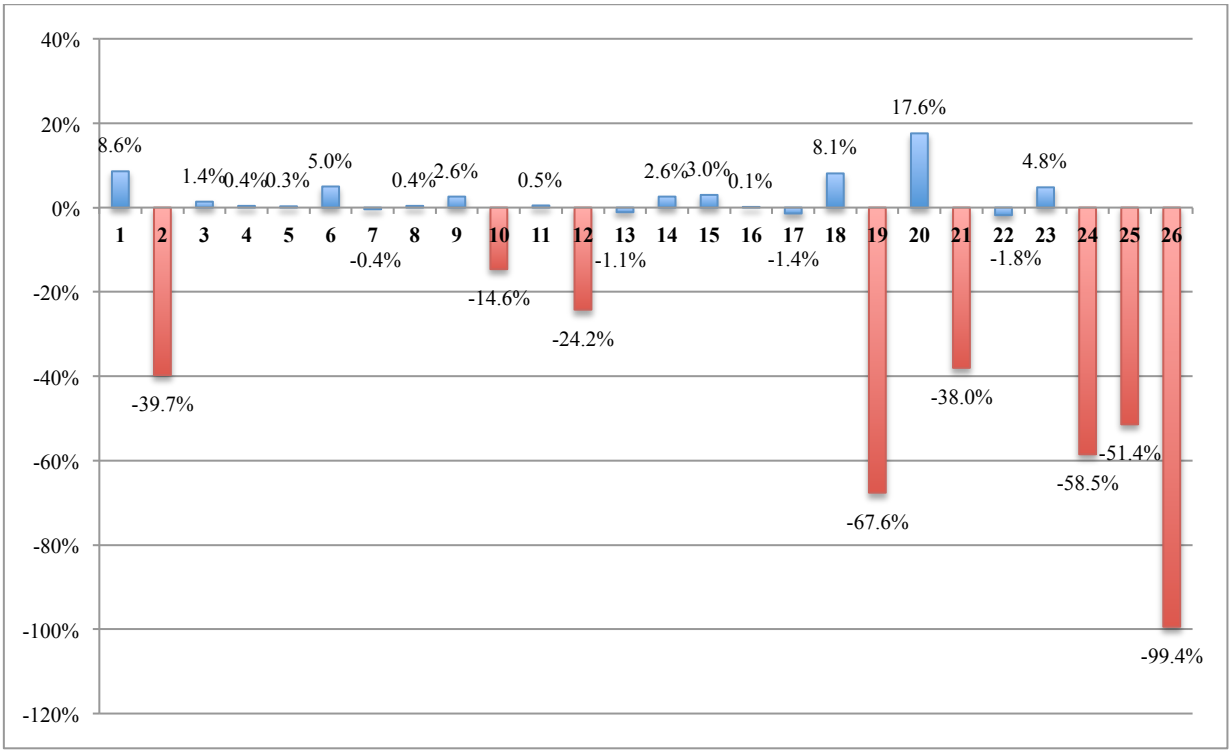
# 9 Appendices

**Appendix 1:** Actuarial position of pension funds in 2015.

Blue columns are Pension funds (PF) without employees guarantee – Funds with a combined actuarial position of 3.2%. Red columns are PF with employees guarantee – Funds with a combined actuarial position of -38%. The numbers are presented in accordance to the size of the funds, with no.1 as the largest.




| Number and funds | |
|---|---|
| **1:** The PF of Commerce | **14:** Lífsverk PF |
| **2:** The PF for State Employees | **15:** The Icelandic PF |
| **3:** Gildi PF | **16:** The PF of Westman Island |
| **4:** Stapi PF | **17:** The PF of Bankers |
| **5:** Almenni PF | **18:** FÍA PF |
| **6:** Frjálsi PF | **19:** The PF for Nurses |
| **7:** Sameinaði PF | **20:** The PF for Employees of Búnaðarbanka Íslands hf. |
| **8:** Stafir PF | **21:** The PF for Employees of Akureyri town |
| **9:** The General PF | **22:** The PF of Rangá |
| **10:** Brú PF | **23:** The PF of the Icelandic Dental Association |
| **11:** Festa PF | **24:** The PF for Employees of Kópavogur town |
| **12:** The PF for Employees of Reykjavík city | **25:** The PF of Reykjanesbær town |
| **13:**The PF of Farmers | **26:** The PF for Employees of Útvegsbanka Íslands |

**Appendix 2:** Overview of the Icelandic Pension funds.

Total assets of the Pension Funds at the end of 2015 with information about active and non-active members, their total assets as well their market share. Note: Funds with employer guarantee are marked with *. Total assets in thousands of ISK.

*Source: FSA, n.d. and author calculations.*

| | *Pension funds* | *Active members* | *Non-active members* | *Total assets ISK* | *Market share* |
|---|---|---|---|---|---|
| 1 | The Pension Fund of Commerce | 45,877 | 97,998 | 583,675,552 | 17.82% |
| 2 | The Pension Fund for State Employees* | 29,493 | 46,771 | 582,946,781 | 17.80% |
| 3 | Gildi Pension Fund | 43,348 | 149,155 | 455,062,825 | 13.89% |
| 4 | Stapi Pension Fund | 18,702 | 58,564 | 179,271,650 | 5.47% |
| 5 | Almenni Pension Fund | 8,955 | 13,195 | 174,151,082 | 5.32% |
| 6 | Frjálsi Pension Fund | 16,041 | 24,314 | 173,857,228 | 5.31% |
| 7 | Sameinaði Pension Fund now Birta | 8,814 | 29,221 | 171,105,546 | 5.22% |
| 8 | Stafir Pension Fund now Birta | 8,198 | 41,448 | 140,847,333 | 4.30% |
| 9 | The General Pension Fund | 12,335 | 106,396 | 139,715,063 | 4.27% |
| 10 | Brú Pension Fund | 23,717 | 58,948 | 114,421,736 | 3.49% |
| 11 | Festa Pension Fund | 15,915 | 56,784 | 112,388,650 | 3.43% |
| 12 | The Pension Fund for Employees of Reykjavík city* | 487 | 1,382 | 72,230,084 | 2.21% |
| 13 | The Pension Fund of Farmers | 2,280 | 5,643 | 67,591,975 | 2.06% |
| 14 | Lífsverk Pension Fund | 2,811 | 1,268 | 66,338,263 | 2.03% |
| 15 | The Icelandic Pension Fund | 2,520 | 4,478 | 54,828,938 | 1.67% |
| 16 | The Westman Island Pension Fund | 2,143 | 10,849 | 45,387,227 | 1.39% |
| 17 | The Pension Fund for Bankers | 2,432 | 6,456 | 30,578,457 | 0.93% |
| 18 | FÍA Pension Fund | 661 | 127 | 29,762,579 | 0.91% |
| 19 | The Pension Fund for Nurses* | 269 | 1,672 | 27,733,912 | 0.85% |
| 20 | The Pension Fund for Employees of Búnaðarbanka Íslands hf. | 41 | 175 | 21,237,046 | 0.65% |
| 21 | The Pension Fund for Employees of Akureyri town* | 102 | 391 | 10,335,402 | 0.32% |
| 22 | The Pension Fund of Rangá | 1,488 | 7,776 | 9,333,873 | 0.28% |
| 23 | The Pension Fund of the Icelandic Dental Association | 193 | 104 | 4,751,803 | 0.15% |
| 24 | The Pension Fund for Employees of Kópvogur town* | 96 | 565 | 4,176,693 | 0.13% |
| 25 | The Pension Fund of Reykjanesbær* | 32 | 517 | 3,945,305 | 0.12% |
| 26 | The Pension Fund for Employees of Útvegsbanka Íslands* | 0 | 173 | 27,816 | 0.00% |
| | **Total** | **246,950** | **724,370** | **3,275,702,819** | **100.00%** |

**Appendix 3:** The investment regulation of pension funds.

The first table presents the investment policy restrictions on mutual insurance, pillar 2.

| **Pension funds Investment policy under article 36 a. Act no. 129/1997.** | |
|---|---|
| ***Restriction*** | ***Percentage of net assets*** |
| Non-listed secuirities | Max 20% |
| Bonds, bills, investment fund shares and other securities without the government guarantee | Max 50% |
| Equity in company shares | Max 60% |
| Combined equity in company shares and investment fund shares or shares of other funds | Max 60% |
| Equity in funds not subject to official supervision | Max 10% |
| Combined equity in securities issued by the same entity or related parties | Max 10% |
| Other securities | Max 5% |
| Securities and deposits issued by the same entity | Max 25% |
| Shares or investment fund shares in each company | Max 15% |
| Investment fund shares or shares issued by the same mutual fund, investment fund or special division | Max 25% |
| Equity in mutual funds and investment funds within the same entity | Max 25% |
| Deposits of the same bank or saving bank | Max 25% |
| Risks associated with foreign currencies | Max 50% |

The second table presents investment policy for private pension plans that are not connected to mutual insurance, pillar 2 and 3.

| **Pension funds Investment policy under article 36 a. Act no. 129/1997.** | |
|---|---|
| ***Restriction*** | ***Percentage of net assets*** |
| Investment in non-listed securities on the regular market | Max 20% |
| Investments issued by the same entity or related parties | Max 20% |
| Investment fund shares or other shares issued by the same mutual funds, investment funds or special division | Max 30% |
| Equity in mutual funds within the same entity | Max 30% |
| Shares of companies | Max 70% |
| Derivatives | Max 10% |

**Appendix 4:** Interview Guide.

***The answers will be identified by the name of the representatives.***

**General information about the merger**

1. What were the motives for the pension fund merger?
2. How did it begin, who made the first contact?
3. Is the merger process long and difficult?
4. What factors need to be considered when it comes to a merger?
    a. What factors are positive when it comes to a merger?
    b. What factors are negative when it comes to a merger?
5. Did employees lose their jobs? What about board members?
6. Does the fund outsource some tasks, projects or management now?

**After the merger**

7. Would you say that both pension funds are better off together today than before the merger?
8. Does economies of scale improve the internal governance?
    a. Does it enable the fund to hire more professional staff?
    b. Does it give the fund opportunity to increase efficiency?
9. Are the costs lower?
    a. Why?
10. Is the performance better?
    a. Better real return?
    b. Why?

***The answers will be anonymous and distinguish with pension funds A, B, C, D, E, F, G***

**Economies of scale**

11. What is your view on economies of scale?
    a. What are the advantages?
12. Do you agree with the statement *"bigger is better"?*

**The number of pension funds**

13. Do you know why there has not been more consolidation of pension funds?
14. Do you think more funds should be consolidated?
15. In 1999 and 2005, two reports discussed reducing the number of funds and one went even further by saying that number of funds would be 10 to 15 in the coming years. Do you know why that has not happened?
16. Is it expensive for us, 320.000 habitants, to have such a high number of pension funds?

**The small funds**

17. Is it possible that the working unions have any connection to or have interfered with merger negotiations?
    a. Or perhaps in general?
18. Do you know why the small funds haven't merged?

## The future

19. What do you think the future will bring regarding the number of funds?
20. Would you think that having one pension fund with employer guarantee is a good solution?

## **Appendix 5:** Timeline of the interviews.

| Pension fund | Date - Time |
|---|---|
| Brú Pension fund | March 31st – 9.00 AM |
| Stapi Pension fund | April 2nd – 3.30 PM |
| Gildi Pension fund | April 3rd – 3.00 PM |
| Birta Pension fund | April 4th – 9.00 AM |
| Pension fund for State Employees | April 4th – 2.00 PM |
| General Pension fund | April 5th – 2.00 PM |
| Almenni Pension fund | April 7th – 1.00 PM |

**Appendix 6:** Grouping from 2011 – 2015.

In this table, the pension funds are grouped by their size, displaying the quantity in each category that year. All data is from annual accounts from FSA. The funds are classified by size.

| Groups | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| **Giants** | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 |
| **Large funds** | 4-10 | 4-10 | 4-11 | 4-11 | 4-11 |
| **Medium funds** | 11-19 | 11-19 | 12-20 | 12-20 | 12-19 |
| **Small funds** | 20-27 | 20-26 | 21-26 | 21-26 | 20-25 |
| **Dwarfs** | 28-33 | 27-32 | 1 | 1 | 1 |

**Appendix 7:** Grouping from 2003 – 2010.

In this table, the pension funds are grouped by their size, displaying the quantity in each category that year. All data is from annual accounts from FSA. The funds are classified by size.

| Groups | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|
| **Giants** | 1-2 | 1-2 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 | 1-3 |
| **Large funds** | 3-12 | 3-12 | 4-12 | 4-11 | 4-12 | 4-12 | 4-13 | 4-10 |
| **Medium funds** | 13-26 | 13-25 | 13-25 | 12-22 | 13-22 | 13-21 | 14-21 | 11-19 |
| **Small funds** | 27-39 | 26-37 | 26-35 | 23-31 | 23-29 | 22-29 | 22-29 | 20-27 |
| **Dwarfs** | 40-50 | 38-48 | 36-46 | 32-41 | 30-37 | 30-37 | 30-37 | 28-33 |

**Appendix 8:** Fund size group – used in the analysis as an estimation for the precursor funds after the merger.

After grouping the funds, data is collected for the each group from 2003 to 2015. All data is from annual accounts from FSA. Amounts in thousands ISK.

**Giants**

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|
| **Total asset** | 269,914,857 | 330,562,965 | 599,764,232 | 738,020,089 | 824,142,694 | 744,559,404 | 838,944,238 |
| **Adm. Cost** | 319,328 | 368,512 | 597,812 | 649,816 | 702,688 | 769,135 | 786,630 |
| **Inv. Cost** | 527,698 | 712,044 | 857,831 | 798,697 | 839,171 | 598,071 | 691,160 |
| **Adm.%** | 0.12% | 0.11% | 0.10% | 0.09% | 0.09% | 0.10% | 0.09% |
| **Inv.%** | 0.20% | 0.22% | 0.14% | 0.11% | 0.10% | 0.08% | 0.08% |
| **Total %** | 0.31% | 0.33% | 0.24% | 0.20% | 0.19% | 0.18% | 0.18% |

**Large funds**

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|
| **Total asset** | 351,027,644 | 424,378,190 | 365,258,192 | 496,750,156 | 619,037,801 | 613,093,762 | 712,093,317 |
| **Adm. Cost** | 527,024 | 632,273 | 551,163 | 641,435 | 722,069 | 756,244 | 944,415 |
| **Inv. Cost** | 400,598 | 471,927 | 520,775 | 613,426 | 744,754 | 746,961 | 795,769 |
| **Adm.%** | 0.15% | 0.15% | 0.15% | 0.13% | 0.12% | 0.12% | 0.13% |
| **Inv.%** | 0.11% | 0.11% | 0.14% | 0.12% | 0.12% | 0.12% | 0.11% |
| **Total %** | 0.26% | 0.26% | 0.29% | 0.25% | 0.24% | 0.25% | 0.24% |

**Medium funds**

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|
| **Total asset** | 164,994,036 | 187,518,193 | 221,212,594 | 229,739,419 | 223,253,698 | 202,408,548 | 183,911,038 |
| **Adm. Cost** | 322,771 | 373,589 | 366,290 | 358,194 | 365,935 | 315,093 | 285,654 |
| **Inv. Cost** | 220,547 | 287,216 | 367,496 | 347,206 | 328,592 | 207,888 | 225,945 |
| **Adm.%** | 0.20% | 0.20% | 0.17% | 0.16% | 0.16% | 0.16% | 0.16% |
| **Inv.%** | 0.13% | 0.15% | 0.17% | 0.15% | 0.15% | 0.10% | 0.12% |
| **Total %** | 0.33% | 0.35% | 0.33% | 0.31% | 0.31% | 0.26% | 0.28% |

**Small funds**

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|
| Total asset | 33,722,834 | 39,549,659 | 28,460,074 | 28,912,009 | 27,212,517 | 34,576,958 | 36,443,585 |
| Adm. Cost | 74,795 | 66,317 | 58,161 | 43,680 | 59,493 | 59,601 | 93,035 |
| Inv. Cost | 75,465 | 65,386 | 40,852 | 37,376 | 60,371 | 51,494 | 56,512 |
| Adm.% | 0.22% | 0.17% | 0.20% | 0.15% | 0.22% | 0.17% | 0.26% |
| Inv.% | 0.22% | 0.17% | 0.14% | 0.13% | 0.22% | 0.15% | 0.16% |
| Total % | 0.45% | 0.33% | 0.35% | 0.28% | 0.44% | 0.32% | 0.41% |

**Dwarfs**

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|
| Total asset | 4,317,994 | 4,525,739 | 4,834,052 | 5,391,257 | 3,560,867 | 3,257,771 | 3,327,616 |
| Adm. Cost | 13,954 | 14,172 | 15,696 | 18,658 | 19,679 | 23,924 | 23,861 |
| Inv. Cost | 7,660 | 7,344 | 20,776 | 11,347 | 11,433 | 10,843 | 13,547 |
| Adm.% | 0.32% | 0.31% | 0.32% | 0.35% | 0.55% | 0.73% | 0.72% |
| Inv.% | 0.18% | 0.16% | 0.43% | 0.21% | 0.32% | 0.33% | 0.41% |
| Total % | 0.50% | 0.48% | 0.75% | 0.56% | 0.87% | 1.07% | 1.12% |

**Giants**

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| Total asset | 901,080,675 | 990,399,165 | 1,141,108,096 | 1,273,102,040 | 1,415,878,320 | 1,621,685,158 |
| Adm. Cost | 818,274 | 956,025 | 1,071,716 | 1,185,079 | 1,241,795 | 1,651,470 |
| Inv. Cost | 684,594 | 794,149 | 894,390 | 997,152 | 977,111 | 699,307 |
| Adm.% | 0.09% | 0.10% | 0.09% | 0.09% | 0.09% | 0.10% |
| Inv.% | 0.08% | 0.08% | 0.08% | 0.08% | 0.07% | 0.04% |
| Total % | 0.17% | 0.18% | 0.17% | 0.17% | 0.16% | 0.14% |

**Large funds**

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| Total asset | 627,867,481 | 691,016,111 | 799,371,539 | 971,830,424 | 1,066,169,164 | 1,205,758,288 |
| Adm. Cost | 925,497 | 1,145,350 | 1,058,691 | 1,225,251 | 1,355,518 | 1,633,700 |
| Inv. Cost | 860,719 | 981,204 | 1,082,807 | 1,411,597 | 1,488,072 | 1,436,775 |
| Adm.% | 0.15% | 0.17% | 0.13% | 0.13% | 0.13% | 0.14% |
| Inv.% | 0.14% | 0.14% | 0.14% | 0.15% | 0.14% | 0.12% |
| Total % | 0.28% | 0.31% | 0.27% | 0.27% | 0.27% | 0.25% |

**Medium funds**

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| Total asset | 314,004,322 | 345,281,434 | 386,056,275 | 368,100,929 | 393,973,359 | 394,451,435 |
| Adm. Cost | 549,897 | 675,114 | 662,174 | 610,211 | 662,577 | 608,428 |
| Inv. Cost | 401,848 | 527,070 | 602,775 | 604,129 | 608,634 | 611,234 |
| Adm.% | 0.18% | 0.20% | 0.17% | 0.17% | 0.17% | 0.15% |
| Inv.% | 0.13% | 0.15% | 0.16% | 0.16% | 0.15% | 0.15% |
| Total % | 0.30% | 0.35% | 0.33% | 0.33% | 0.32% | 0.31% |

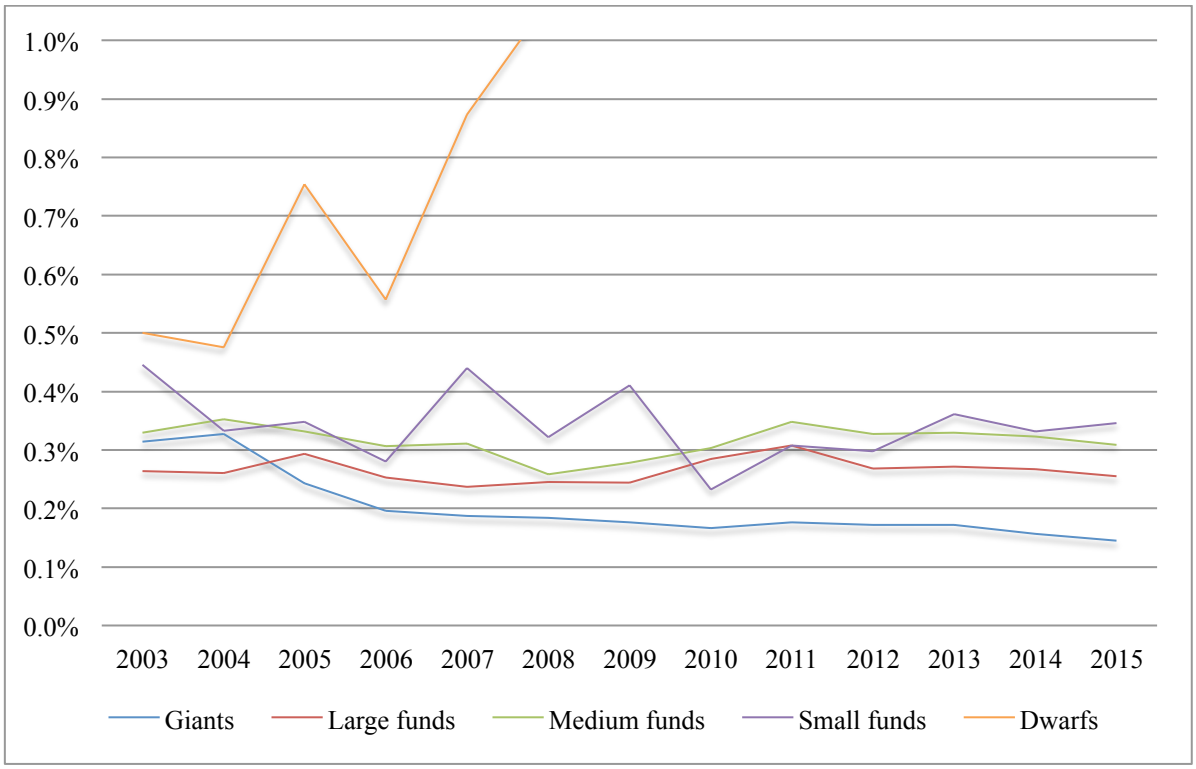
**Small funds**

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| **Total asset** | 62,619,546 | 67,245,102 | 64,259,633 | 47,582,003 | 49,319,748 | 53,780,122 |
| **Adm. Cost** | 83,936 | 125,498 | 97,626 | 101,630 | 88,770 | 118,169 |
| **Inv. Cost** | 61,602 | 81,666 | 93,554 | 70,090 | 74,810 | 68,029 |
| **Adm.%** | 0.13% | 0.19% | 0.15% | 0.21% | 0.18% | 0.22% |
| **Inv.%** | 0.10% | 0.12% | 0.15% | 0.15% | 0.15% | 0.13% |
| **Total %** | 0.23% | 0.31% | 0.30% | 0.36% | 0.33% | 0.35% |

**Dwarfs**

| | 2010 | 2011 | 2012 |
|---|---|---|---|
| **Total asset** | 3,944,894 | 3,906,745 | 4,153,372 |
| **Adm. Cost** | 34,883 | 42,771 | 55,476 |
| **Inv. Cost** | 17,410 | 22,092 | 30,857 |
| **Adm.%** | 0.88% | 1.09% | 1.34% |
| **Inv.%** | 0.44% | 0.57% | 0.74% |
| **Total %** | 1.33% | 1.66% | 2.08% |

**Appendix 8a:** The development in operating costs as a percentage of total assets from 2003-2015.

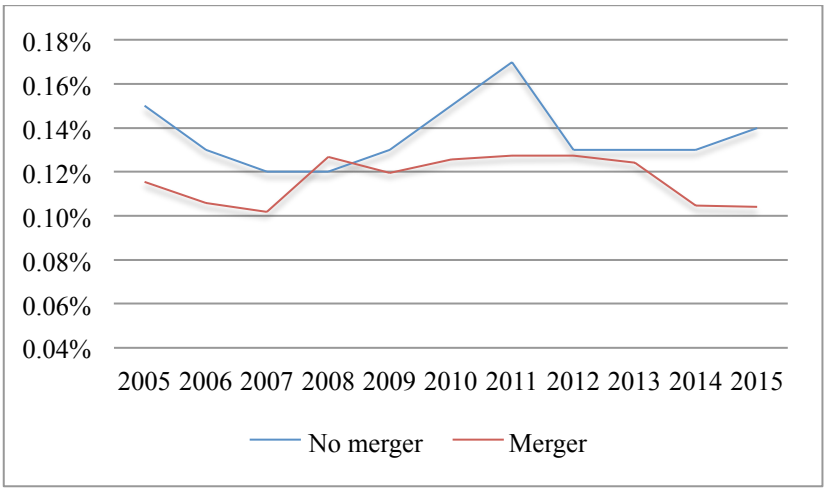


**Appendix 9:** Gildi.

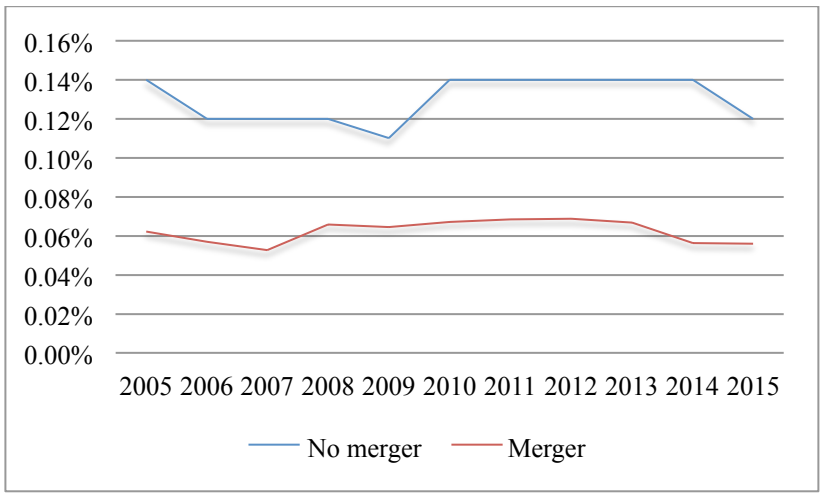
The table presents the AC and IC of LF and LS in 2004 along with total assets before the merger. Amounts in thousands ISK.

| 2004 | LF | LS |
|---|---|---|
| AC % | 0.16% | 0.12% |
| IC % | 0.09% | 0.04% |
| Total assets | 76,271,789 | 68,451,596 |
| AC | 120,324 | 70,656 |
| IC | 68,141 | 30,221 |

Both of the LF and LS were in the same group, large, so it is possible to use only one estimation for the large group for the costs. The figure presents the AC estimation if there would be no merger and real data of AC for Gildi.




The figure presents the IC estimation if there would be no merger and real data of IC for Gildi.

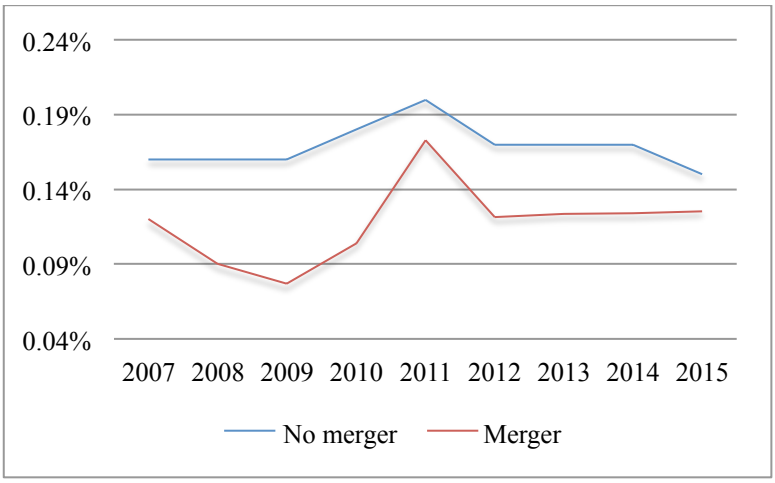


**Appendix 10:** Stapi.

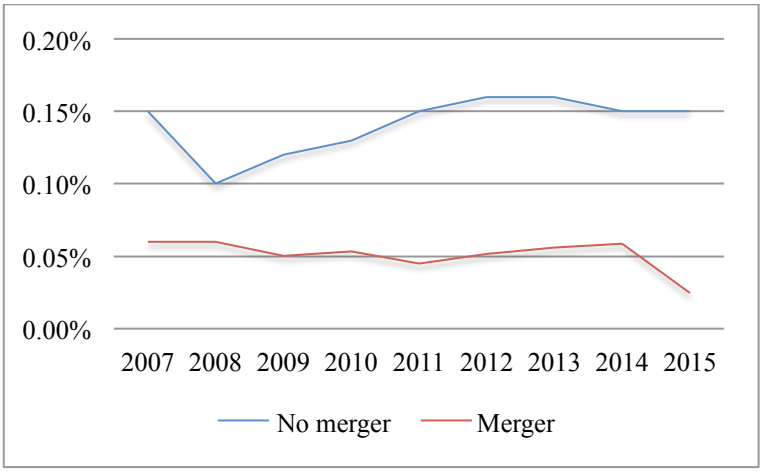
The table presents the AC and IC of LF and LS in 2004 along with total assets before the merger. Amounts in thousands ISK.

| 2006 | PA | PN |
|---|---|---|
| AC % | 0.10% | 0.12% |
| IC % | 0.20% | 0.06% |
| Total assets | 27,458,144 | 56,431,731 |
| AC | 28,394 | 67,356 |
| IC | 54,167 | 32,241 |

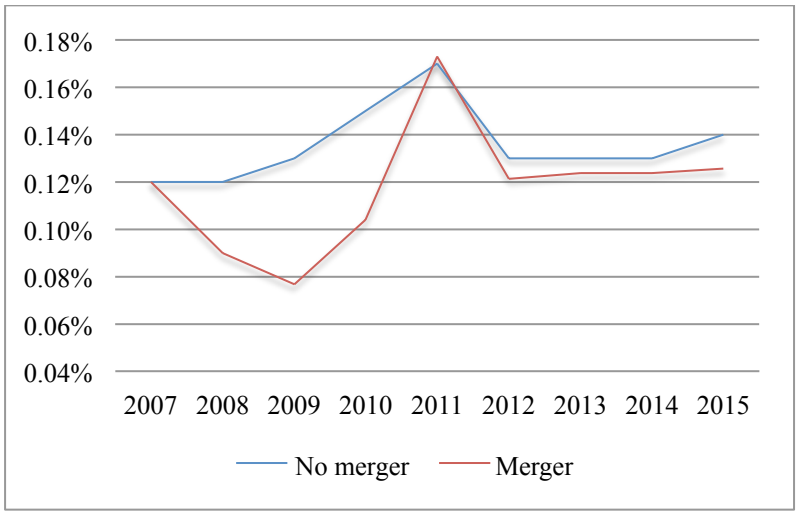
The PA is categorized in the medium fund size group and PN in the large fund size group, therefore both estimations of the group will be presented. The figure presents the AC estimation for the funds if there would be no merger and real data of AC for Stapi.



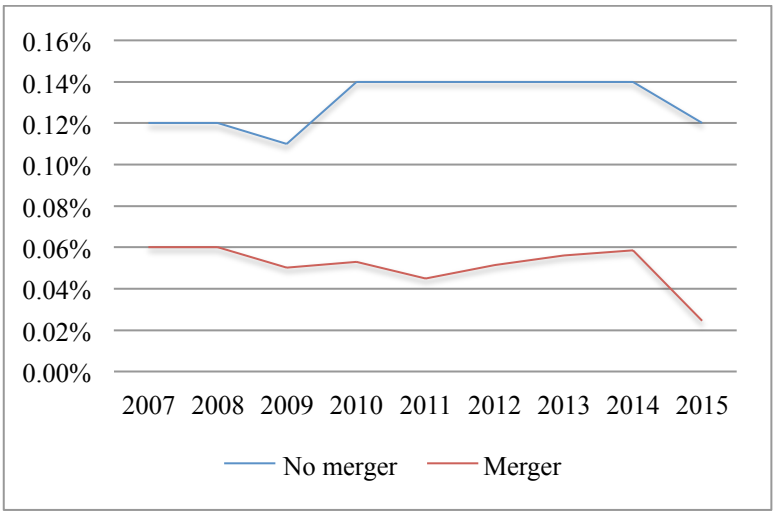

The figure presents the IC estimation for PA if there would be no merger and real data of IC for Stapi.



The figure presents the AC estimation for PN if there would be no merger and real data of AC for Stapi.




The figure presents the IC estimation for PA if there would be no merger and real data of IC for Stapi.

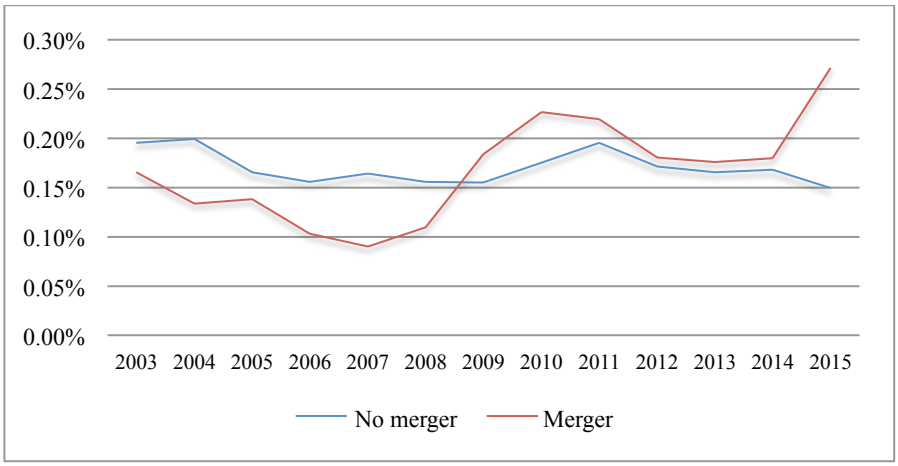


**Appendix 11:** Almenni.

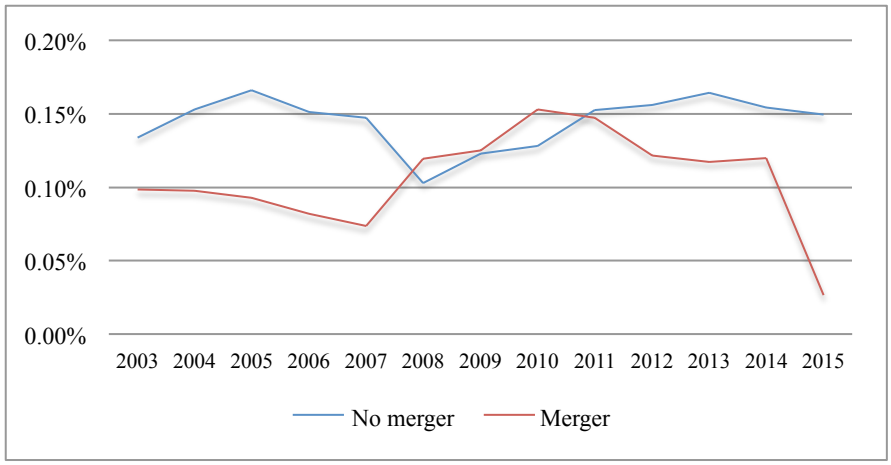
The table presents the AC and IC of APVÍB and PAT in 2002 along with total assets, before the merger. Amounts in thousands ISK.

| 2002 | APVÍB | PAT |
|---|---|---|
| AC % | 0.23% | 0.10% |
| IC % | 0.12% | 0.02% |
| Total assets | 12,715,335 | 6,769,009 |
| AC | 28,812 | 6,655 |
| IC | 14,926 | 1,535 |

Both of APVÍB and PAT were in the same group, medium, so it is possible to use only one estimation for the medium funds group for the costs. The figure presents the AC estimation if there would be no merger and real data of AC for Almenni.

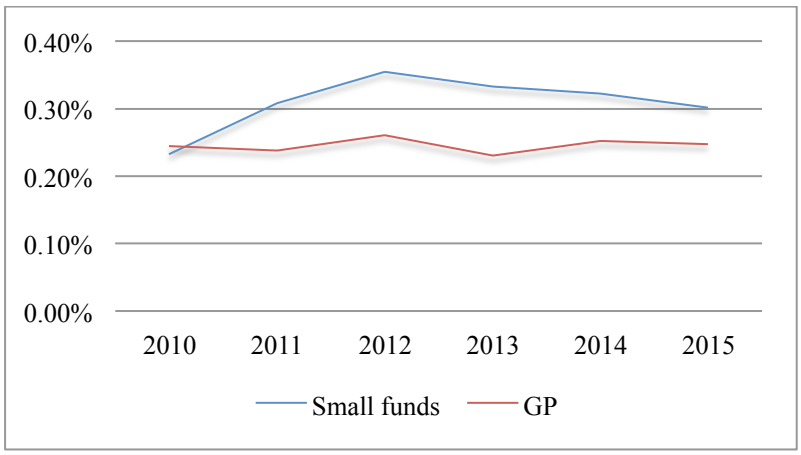



The figure presents the IC estimation if there would be no merger and real data of IC for Almenni.



**Appendix 12:** General Pension fund.

The figure presents the OC estimation for the small funds, which are Kjölur and PEG, if there would be no merger and the real data of OC for GP. The dwarfs all merged into other funds by the end of 2013 so there were no dwarfs to make an estimation for the period.

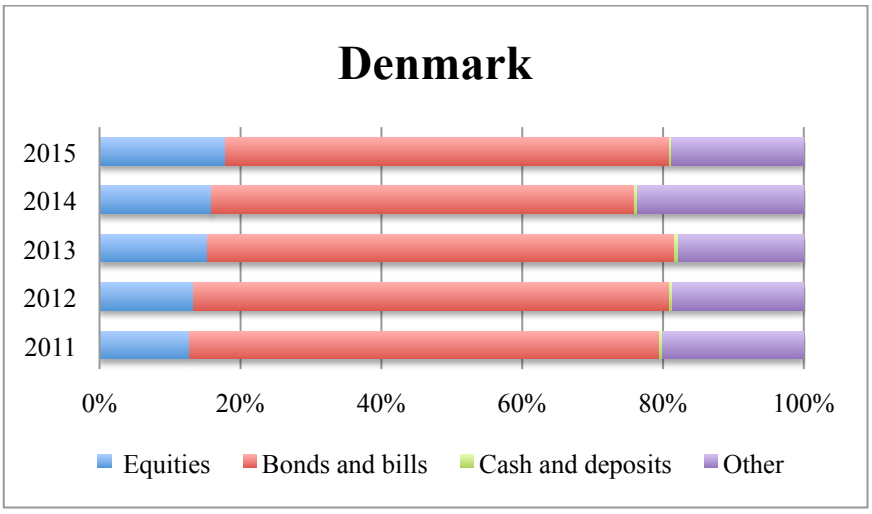


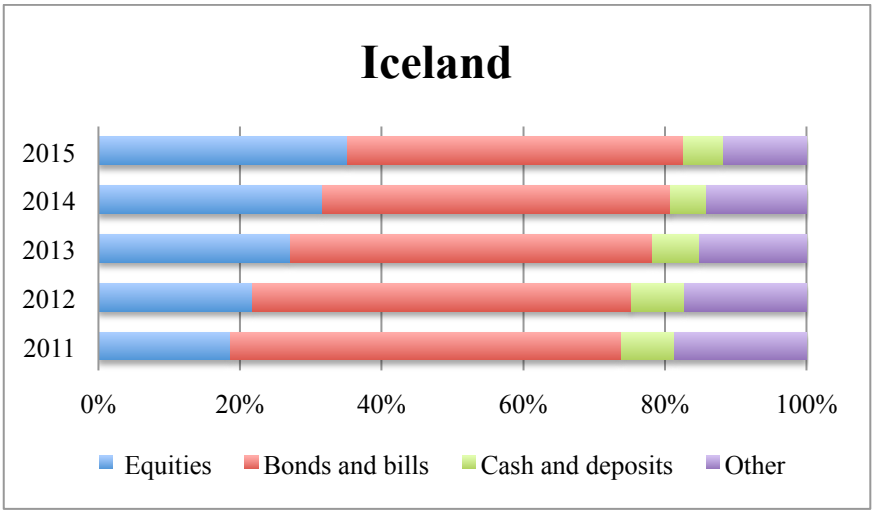
**Appendix 13:** Total investment of each Nordic pension fund, in millions of national currency, 2005-2015.

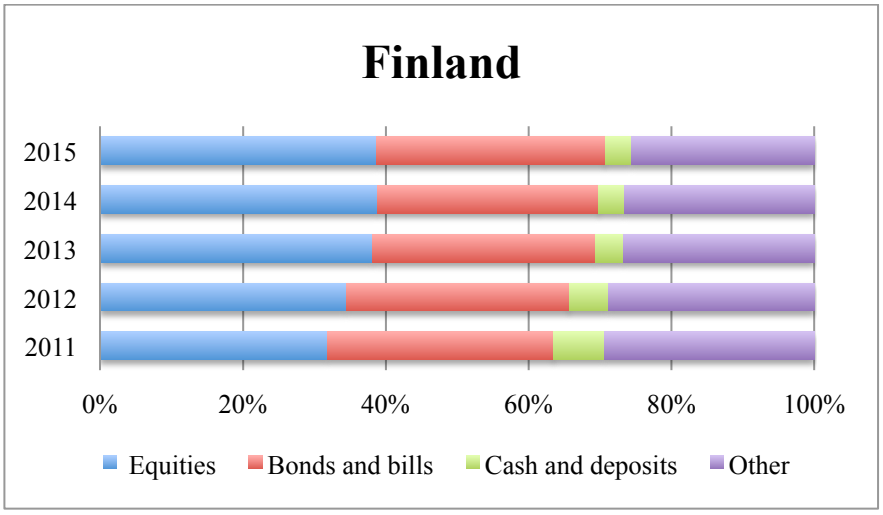
| Nordics | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| **Denmark (DKK)** | 887,898 | 913,143 | 794,041 | 932,586 | 890,583 |
| **Iceland (ISK)** | 2,148,253 | 2,421,504 | 2,680,354 | 2,916,818 | 3,275,703 |
| **Finland (EUR)** | 83,419 | 90,648 | 98,362 | 104,148 | 103,343 |
| **Norway (NOK)** | 201,427 | 219,759 | 248,723 | 151,251 | 142,810 |

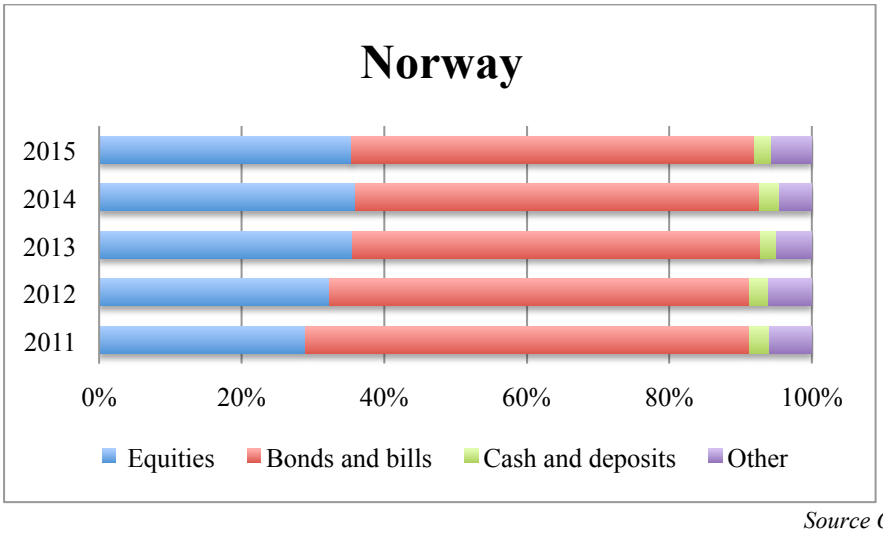
*Source OECD, 2016.*

**Appendix 14:** Asset allocation for each Nordic pension fund.






*Source OECD, 2016.*

**Appendix 15:** Analysis of real return and costs.

| | Pension funds | Year 2015 Adm.cost | Investm.cost | Total costs | Total assets | 2015 Real return | The proportion of costs from total assets | Year 2014 Adm.cost | Investm.cost | Total costs | Total assets | 2014 Real return | The proportion of costs from total assets |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | The Pension Fund of Commerce | 712,082 | 98,607 | 810,689 | 583,675,552 | 10.2% | 0.14% | 395,775 | 393,564 | 789,339 | 509,068,592 | 8.7% | 0.16% |
| 2 | The Pension Fund for State Employees* | 466,324 | 345,973 | 812,297 | 582,946,781 | 6.5% | 0.14% | 418,095 | 353,125 | 771,220 | 535,472,071 | 8.9% | 0.14% |
| 3 | Gildi - Pension Fund | 473,064 | 254,727 | 727,791 | 455,062,825 | 7.7% | 0.16% | 427,925 | 230,422 | 658,347 | 409,028,290 | 8.8% | 0.16% |
| 4 | Stapi Pension Fund | 225,012 | 43,742 | 268,754 | 179,271,650 | 9.2% | 0.15% | 194,160 | 91,864 | 286,024 | 156,764,347 | 5.2% | 0.18% |
| 5 | Almenni Pension Fund | 472,677 | 45,842 | 518,519 | 174,151,082 | 6.5% | 0.30% | 281,096 | 187,539 | 468,635 | 156,487,145 | 6.2% | 0.30% |
| 6 | Frjálsi Pension Fund | 180,725 | 396,395 | 577,120 | 173,857,228 | 8.4% | 0.33% | 162,994 | 341,898 | 504,892 | 146,297,929 | 4.5% | 0.35% |
| 7 | Sameinaði Pension Fund - now Birta Pension Fund | 178,608 | 203,703 | 382,311 | 171,105,546 | 7.1% | 0.22% | 183,045 | 196,031 | 379,076 | 155,923,495 | 6.3% | 0.24% |
| 8 | Stafir Pension Fund - now Birta Pension Fund | 157,904 | 186,170 | 344,074 | 140,847,333 | 9.7% | 0.24% | 155,940 | 174,034 | 329,974 | 124,567,225 | 7.4% | 0.26% |
| 9 | General Pension Fund | 120,335 | 225,012 | 345,347 | 139,715,063 | 6.3% | 0.25% | 119,907 | 204,870 | 324,777 | 129,008,053 | 6.7% | 0.25% |
| 10 | Brú Pension Fund | 167,569 | 222,844 | 390,413 | 114,421,736 | 8.1% | 0.34% | 132,973 | 185,422 | 318,395 | 98,166,555 | 4.6% | 0.32% |
| 11 | Festa Pension Fund | 130,870 | 113,067 | 243,937 | 112,388,650 | 8.2% | 0.22% | 125,403 | 106,414 | 231,817 | 98,954,415 | 6.7% | 0.23% |
| 12 | The Pension Fund for Employees of Reykjavik town* | 90,590 | 117,727 | 208,317 | 72,230,084 | 6.3% | 0.29% | 75,327 | 101,739 | 177,066 | 68,076,972 | 4.1% | 0.26% |
| 13 | The Pension Fund of Farmers | 39,029 | 122,122 | 161,151 | 67,591,975 | 8.1% | 0.24% | 36,558 | 109,504 | 146,062 | 62,950,901 | 5.4% | 0.23% |
| 14 | Lífsverk Pension Fund | 135,933 | 156,435 | 292,368 | 66,338,263 | 8.0% | 0.44% | 110,815 | 143,815 | 254,630 | 57,656,617 | 6.1% | 0.44% |
| 15 | The Icelandic Pension Fund | 128,807 | 74,186 | 202,993 | 54,828,938 | 11.6% | 0.37% | 45,039 | 64,160 | 109,199 | 45,235,139 | 4.9% | 0.24% |
| 16 | The Pension Fund of Vestmannaeyjar | 52,949 | 23,003 | 75,952 | 45,387,227 | 8.0% | 0.17% | 48,988 | 45,039 | 94,027 | 41,166,381 | 7.5% | 0.23% |
| 17 | The Pension Fund for Bankers | 85,675 | 41,784 | 127,459 | 30,578,457 | 4.8% | 0.42% | 74,593 | 24,029 | 98,622 | 28,437,340 | 4.4% | 0.35% |
| 18 | FÍA Pension Fund | 27,954 | 51,722 | 79,676 | 29,762,579 | 12.5% | 0.27% | 23,801 | 45,749 | 69,550 | 25,400,121 | 5.3% | 0.27% |
| 19 | The Pension Fund for Nurses* | 47,491 | 24,255 | 71,746 | 27,733,912 | 5.1% | 0.26% | 39,523 | 27,154 | 66,677 | 27,359,253 | 9.3% | 0.24% |
| 20 | The Pension Fund for Employees of Búnaðarbanka Íslands hf. | 13,251 | 10,152 | 23,403 | 21,237,046 | 9.9% | 0.11% | 11,945 | 10,328 | 22,273 | 19,870,811 | 5.4% | 0.11% |
| 21 | The Pension Fund for Employees of Akureyri town* | 28,968 | 1,002 | 29,970 | 10,335,402 | 9.0% | 0.29% | 19,114 | 6,200 | 25,314 | 9,387,532 | 4.7% | 0.27% |
| 22 | The Pension Fund of Rangá | 24,189 | 32,749 | 56,938 | 9,333,873 | 6.7% | 0.61% | 21,753 | 31,873 | 53,626 | 8,368,391 | 4.2% | 0.64% |
| 23 | The Pension Fund of the Icelandic Dental Association | 13,297 | 3,528 | 16,825 | 4,751,803 | 10.9% | 0.35% | 10,185 | 5,429 | 15,614 | 4,111,077 | 4.8% | 0.38% |
| 24 | The Pension Fund for Employees of Kópavogur town* | 15,439 | 12,266 | 27,705 | 4,176,693 | 5.9% | 0.66% | 13,587 | 9,057 | 22,644 | 3,917,094 | 4.3% | 0.58% |
| 25 | The Pension Fund of Reykjanesbær* | 23,025 | 8,332 | 31,357 | 3,945,305 | N/A | 0.79% | 12,186 | 11,923 | 24,109 | 3,664,843 | N/A | 0.66% |
| 26 | The Pension Fund for Employees of Útvegsbanka Íslands* | 10,605 | 1 | 10,606 | 27,816 | N/A | 38.13% | 10,309 | 0 | 10,309 | 24,246 | N/A | 42.52% |
| | | 4,022,372 | 2,815,346 | 6,837,718 | 3,275,702,819 | | | 3,151,036 | 3,101,182 | 6,252,218 | 2,925,364,835 | | |

| | Pension funds | Year 2013 Adm.cost | Investm.cost | Total costs | Total assets | 2013 Real return | The proportion of costs from total assets | Year 2012 Adm.cost | Investm.cost | Total costs | Total assets | 2012 Real return | The proportion of costs from total assets |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | The Pension Fund of Commerce | 379,593 | 359,490 | 739,083 | 453,824,930 | 6.3% | 0.16% | 340,876 | 330,669 | 671,545 | 402,204,585 | 8.5% | 0.17% |
| 2 | The Pension Fund for State Employees* | 390,778 | 414,357 | 805,135 | 484,953,415 | 6.5% | 0.17% | 345,486 | 356,222 | 701,708 | 436,644,946 | 9.2% | 0.16% |
| 3 | Gildi - Pension Fund | 414,708 | 223,305 | 638,013 | 334,323,695 | 5.3% | 0.19% | 385,354 | 207,499 | 592,853 | 302,258,565 | 7.3% | 0.20% |
| 4 | Stapi Pension Fund | 177,592 | 80,568 | 258,160 | 143,501,472 | 0.8% | 0.18% | 159,826 | 67,798 | 227,624 | 131,656,561 | 4.1% | 0.17% |
| 5 | Almenni Pension Fund | 250,312 | 167,192 | 417,504 | 142,468,760 | 3.7% | 0.29% | 232,896 | 156,913 | 389,809 | 128,994,691 | 9.8% | 0.30% |
| 6 | Frjálsi Pension Fund | 149,314 | 314,712 | 464,026 | 132,034,234 | 5.3% | 0.35% | 140,261 | 284,620 | 424,881 | 116,668,133 | 5.7% | 0.36% |
| 7 | Sameinaði Pension Fund - now Birta Pension Fund | 161,120 | 185,434 | 346,554 | 144,511,102 | 6.1% | 0.24% | 144,148 | 157,333 | 301,481 | 130,721,731 | 8.6% | 0.23% |
| 8 | Stafir Pension Fund - now Birta Pension Fund | 166,079 | 172,604 | 338,683 | 113,533,770 | 4.9% | 0.30% | 140,758 | 162,454 | 303,212 | 102,973,797 | 6.0% | 0.29% |
| 9 | General Pension Fund | 94,992 | 181,143 | 276,135 | 119,835,642 | 6.2% | 0.23% | 129,015 | 154,251 | 283,266 | 108,759,118 | 7.3% | 0.26% |
| 10 | Brú Pension Fund | 106,822 | 210,900 | 317,722 | 86,557,244 | 4.3% | 0.37% | 96,612 | 132,245 | 228,857 | 73,824,436 | 4.1% | 0.31% |
| 11 | Festa Pension Fund | 119,020 | 99,044 | 218,064 | 89,388,202 | 5.5% | 0.24% | 111,787 | 99,438 | 211,225 | 79,597,508 | 6.0% | 0.27% |
| 12 | The Pension Fund for Employees of Reykjavik town* | 70,449 | 99,343 | 169,792 | 65,834,582 | 4.2% | 0.26% | 66,260 | 81,256 | 147,516 | 61,924,369 | 3.4% | 0.24% |
| 13 | The Pension Fund of Farmers | 36,820 | 92,322 | 129,142 | 27,337,987 | 5.6% | 0.47% | 36,691 | 75,283 | 111,974 | 25,558,890 | 5.5% | 0.44% |
| 14 | Lífsverk Pension Fund | 90,532 | 173,255 | 263,787 | 51,360,107 | 4.8% | 0.51% | 83,608 | 120,122 | 203,730 | 44,979,335 | 5.8% | 0.45% |
| 15 | The Icelandic Pension Fund | 144,677 | 64,055 | 208,732 | 41,531,817 | 5.7% | 0.50% | 140,963 | 62,777 | 203,740 | 37,140,554 | 3.2% | 0.55% |
| 16 | The Pension Fund of Vestmannaeyjar | 47,746 | 40,727 | 88,473 | 37,900,379 | 4.1% | 0.23% | 48,345 | 55,637 | 103,982 | 34,916,342 | 6.5% | 0.30% |
| 17 | The Pension Fund for Bankers | 63,009 | 21,334 | 84,343 | 60,087,950 | 4.5% | 0.14% | 61,956 | 20,012 | 81,968 | 55,723,338 | 5.1% | 0.15% |
| 18 | FÍA Pension Fund | 9,387 | 42,812 | 52,199 | 23,472,107 | 9.6% | 0.22% | 20,137 | 36,346 | 56,483 | 20,372,735 | 5.4% | 0.28% |
| 19 | The Pension Fund for Nurses* | 35,720 | 32,687 | 68,407 | 25,993,228 | 7.3% | 0.26% | 33,439 | 28,453 | 61,892 | 24,469,403 | 9.6% | 0.25% |
| 20 | The Pension Fund for Employees of Búnaðarbanka Íslands hf. | 14,976 | 9,387 | 24,363 | 19,568,965 | 8.3% | 0.12% | 13,296 | 8,241 | 21,537 | 18,217,108 | 5.9% | 0.12% |
| 21 | The Pension Fund for Employees of Akureyri town* | 18,184 | 5,918 | 24,102 | 9,119,255 | 7.2% | 0.26% | 17,449 | 5,628 | 23,077 | 8,450,217 | 3.0% | 0.27% |
| 22 | The Pension Fund of Rangá | 27,345 | 27,345 | 54,690 | 7,754,917 | 4.4% | 0.71% | 15,063 | 26,795 | 41,858 | 7,018,506 | 5.3% | 0.60% |
| 23 | The Pension Fund of the Icelandic Dental Association | 9,912 | 4,094 | 14,006 | 3,818,190 | 6.2% | 0.37% | 8,233 | 4,322 | 12,555 | 3,446,856 | 4.0% | 0.36% |
| 24 | The Pension Fund for Employees of Kópavogur town* | 13,180 | 8,787 | 21,967 | 3,757,828 | 6.5% | 0.58% | 13,213 | 8,808 | 22,021 | 3,437,603 | 6.4% | 0.64% |
| 25 | The Pension Fund of Reykjanesbær* | 18,033 | 6,014 | 24,047 | 3,562,848 | N/A | 0.67% | 10,235 | 3,414 | 13,649 | 3,316,608 | N/A | 0.41% |
| 26 | The Pension Fund for Employees of Útvegsbanka Íslands* | 10,403 | 0 | 10,403 | 2,878 | N/A | 361.47% | 10,057 | 0 | 10,057 | 12,193 | N/A | 82.48% |
| | | 3,020,703 | 3,036,829 | 6,057,532 | 2,626,035,504 | | | 2,805,964 | 2,315,867 | 5,452,500 | 2,363,288,128 | | |

| | Pension funds | Year 2011 Adm.cost | Investm.cost | Total costs | Total assets | 2011 Real return | The proportion of costs from total assets | Real return: How many times it is in top 5 | Cost: Under 0.20% |
|---|---|---|---|---|---|---|---|---|---|
| 1 | The Pension Fund of Commerce | 337,654 | 294,350 | 632,004 | 345,513,402 | 2.8% | 0.18% | 3x | Yes always |
| 2 | The Pension Fund for State Employees* | 304,182 | 317,985 | 622,167 | 379,505,524 | 1.8% | 0.16% | 3x | Yes always |
| 3 | Gildi - Pension Fund | 337,654 | 181,814 | 519,468 | 265,380,239 | 2.7% | 0.20% | 1x | Yes always |
| 4 | Stapi Pension Fund | 202,508 | 52,826 | 255,334 | 117,132,148 | 1.0% | 0.22% | 0x | Three years |
| 5 | Almenni Pension Fund | 241,865 | 162,030 | 403,895 | 110,081,536 | 4.2% | 0.37% | 2x | Never |
| 6 | Frjálsi Pension Fund | 153,962 | 289,052 | 443,014 | 99,715,436 | 3.6% | 0.44% | 1x | Never |
| 7 | Sameinaði Pension Fund - now Birta Pension Fund | 225,122 | 139,865 | 364,987 | 114,340,749 | 1.9% | 0.32% | 1x | Never |
| 8 | Stafir Pension Fund - now Birta Pension Fund | 128,050 | 145,098 | 273,148 | 91,461,698 | 2.2% | 0.30% | 0x | Never |
| 9 | General Pension Fund | 96,455 | 113,757 | 210,212 | 88,403,669 | 3.0% | 0.24% | 0x | Never |
| 10 | Brú Pension Fund | 153,265 | 168,588 | 321,853 | 58,467,092 | 3.6% | 0.55% | 1x | Never |
| 11 | Festa Pension Fund | 97,388 | 78,576 | 175,964 | 69,880,875 | 1.8% | 0.25% | 0x | Never |
| 12 | The Pension Fund for Employees of Reykjavik town* | 72,825 | 57,979 | 130,804 | 58,203,227 | 3.2% | 0.22% | 0x | Never |
| 13 | The Pension Fund of Farmers | 54,014 | 63,244 | 117,258 | 23,831,385 | 2.9% | 0.49% | 0x | Never |
| 14 | Lífsverk Pension Fund | 81,349 | 112,696 | 194,045 | 38,592,154 | 0.9% | 0.50% | 0x | Never |
| 15 | The Icelandic Pension Fund | 37,880 | 14,893 | 52,773 | 33,734,148 | 2.0% | 0.16% | 1x | One year |
| 16 | The Pension Fund of Vestmannaeyjar | 64,509 | 33,689 | 98,198 | 30,986,915 | 0.9% | 0.32% | 1x | One year |
| 17 | The Pension Fund for Bankers | 101,750 | 20,752 | 122,502 | 50,985,662 | 4.8% | 0.24% | 1x | Two years |
| 18 | FÍA Pension Fund | 28,450 | 16,153 | 44,603 | 18,186,547 | 2.4% | 0.25% | 2x | Never |
| 19 | The Pension Fund for Nurses* | 28,315 | 25,278 | 53,593 | 22,308,968 | 1.6% | 0.24% | 3x | Never |
| 20 | The Pension Fund for Employees of Búnaðarbanka Íslands hf. | 24,464 | 7,362 | 31,826 | 17,104,234 | 4.7% | 0.19% | 3x | Yes always |
| 21 | The Pension Fund for Employees of Akureyri town* | 22,751 | 5,324 | 28,075 | 8,075,514 | 3.0% | 0.35% | 0x | Never |
| 22 | The Pension Fund of Rangá | 13,427 | 32,686 | 46,113 | 6,239,481 | 3.2% | 0.74% | 0x | Never |
| 23 | The Pension Fund of the Icelandic Dental Association | 7,715 | 843 | 8,558 | 3,122,493 | 2.2% | 0.27% | 1x | Never |
| 24 | The Pension Fund for Employees of Kópavogur town* | 14,617 | 6,264 | 20,881 | 3,107,690 | -0.1% | 0.67% | 1x | Never |
| 25 | The Pension Fund of Reykjanesbær* | 9,486 | 3,166 | 12,652 | 3,081,060 | N/A | 0.41% | N/A | Never |
| 26 | The Pension Fund for Employees of Útvegsbanka Íslands* | 9,121 | 1 | 9,122 | 21,302 | N/A | 42.82% | N/A | Never |
| | | 2,848,778 | 2,344,271 | 5,193,049 | 2,057,463,148 | | | | |