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‘BI Norwegian Business School – Thesis’

Risk and rationality in occupational pensions

– *Defined-benefit vs. defined-contribution from a
corporate standpoint* –

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On June 28th 2012, the Banking Law Commission published their report “Pensjonslovene og Folketrygdreformen II” on future pension design in the Norwegian market. Although the report is mentioned in this thesis, it is not incorporated in the analysis, discussions or conclusions as the main analysis was conducted in the period up until June 15th.

2 Executive summary

In Norway, pensions are conceived to be a right, and perhaps not an earned benefit. Changes in the demographic structure in the Norwegian population have produced a need for pension accumulation outside the public scope. This is taken care of by the component anchored in an employment relationship of the pension mix. This thesis occupies itself with the market for occupational pensions in Norway. Specifically, it is occupied with an organization where the employees are enrolled in a defined-benefit pension plan with the Norwegian Public Service Pension Fund. The thesis seeks to view the uncertainties and risks associated with pension accumulation from a corporate perspective, and provides less attention to the pension plan beneficiaries and regulatory frameworks affecting financial service providers. Ideal types are constructed in order to produce variation and comparative outcomes between the two available pension designs, as well as to identify how legislative caps affect pension accumulation.

The analysis and discussions provide conclusions that are in line with recent literature. Defined-contribution pension plan design provides full certainty for the employers through transfer of risk to the employees. In addition, the thesis provides arguments contrary to popular belief. Defined-contribution pension plans may very well produce identical lifelong annual retirement income to a defined-benefit design. All it takes are certain returns to capital and substantial annual accumulation rates from the sponsoring organization. This implies that with certain characteristics, a best scenario outcome can be produced for both participants in the employment relationship.

3 Introduction

3.1 Topic

In one word, the topic for this thesis is “risk”. Individuals, employing institutions and nation states all face risk on a daily basis, just that they are manifested in various shapes and forms. Businesses, or employing organizations, face several forms of risk, but this thesis will address risks connected to supplying retirement income, or pensions for its employees. For the purpose of the thesis, risk will be approached from the perspective of the employment relationship part of the pension system, and more specific how risk is divided between employers and employees. In a modern welfare state, like in Norway, employers have a substantial responsibility for their employees in many respects. In economic terms, this is not only the case during the period in which the individuals are partaking in the workforce, but also after they retire. In recent years, much attention has been given to the fact that the world’s population is in a state of aging. Such a demographic shift feeds into the debate over pension, in the sense of “who are to pay for an individual’s retirement income?” Specifically it feeds into the national pension arrangements, but also into the employment-based component of the pension, through divergence in the two pension designs eligible by law. The existence of two “competing” pension designs stems from the fact that the reach of occupational pensions was limited to the public sector. To incentivize private sector businesses to provide such pension arrangements a second design was introduced. The increased reach of the defined-contribution design must be interpreted as shifting the risk from the employers sponsoring the pension plan to the employees. This split will be a focal point of the thesis and one returned to in greater detail. In its duration, the thesis will provide arguments and examples for how political mechanisms concerning the pension system produce different economic effects through the affected actors and their preferences for risk. It will also provide arguments for why these effects are highly dependent on pension plan design and accumulation of funds.

In a welfare state like the Norwegian one, pensions is a controversial topic. It rests as one of the main pillars of the welfare state regime, with vital responsibilities. Also contributing to making pensions controversial is the complexity of the system in which it resides. The main reason for this is the complexity of the

matter and the different levels of analysis that can be availed of. Changes and amendments to the system have different implications for different groups and entities in society. Thus, pensions in Norway go straight to the center of the bordering lines between the state, companies operating in a competitive market and individuals dependent on future streams of income from accumulated rights. Reforms of recent years have changed the pension system away from one being state subsidized into one being dependent on an employment relationship. The same reforms have attempted to bridge the previous gap between retirement income for employees in the private and public sector, whilst the income gap during working years has not been addressed in the same way and with the same political determination.

3.2 Research question

Basically, pensions are about handling the risk affiliated with unemployment at old age. When the economic income from partaking in the workforce disappears, the financial resources need to come from another source. In a modern welfare state, the supplying mechanism of this income, are pensions. Pensions can be determined through two different logics, defined-benefit and defined-contribution. What separates the two is not only the mechanism behind the accumulation of pension rights, but also the assignment of risk. Whilst a defined-benefit pension plan assigns the risk to the employer, the defined-benefit plan shifts the risk connected to the future income over on the employee. It is this placing of risk that is to be the central topic for this thesis. It will attempt to model the impact of the two different pension plan designs through an illustrative employing organization experiencing the dilemma of pension plan coexistence. In the duration of the thesis, the following research question is sought answered:

“How are employing organizations¹ affected by pension system design, and how does the coexistence of plans affect an organizations’ rationality in long-term economic planning?”

¹ The term employing organizations is used as the common term for firms, legal entities and employers functioning as a responsible employer with a legal or contractual obligation to provide pension for its employees.

In order to provide a sufficiently detailed, whilst at the same time maintaining a system perspective, partial questions will be used throughout the thesis in order to secure a coherent build-up of context, arguments, analysis and conclusions.

3.3 Data and method

The thesis will depart from, and restrict itself to, the Norwegian pension system and the pension plan designs allowed for within its scope. This is done in order to produce a sufficient level of detail, whilst at the same time allowing for a macro-level perspective at a time of reforms and fundamental changes to underlying system logics and mechanisms. The illustrative organization is a private university college and divides its employees into two groups. These two groups accumulate pensions through separate designs and represent different effects for economic planning and investments in research and scholarships. The use of ideal type individuals serves all purposes concerning the analysis undertaken in this thesis and will be used extensively in Chapters 5 and 6. The Norwegian pension system and the subsequent pension payments to individuals are quite individualized and enlightening analysis therefore relies on assumptions of age and life expectancy, salary and future income projections, as well as public pension provision. Ideal types offer a researcher these assumptions in an easily understood framework, and the ideal types used for the purposes of the analysis are thoroughly described and elaborated upon in Chapter 7.

The thesis will elaborate on two analytical characteristics of the Norwegian pension system. The first is the context for employing organizations in Norway and the second is how the risk is manifested for a single business. The former is the broader pension system and how the interplay between universal, public schemes and pension plans connected to an employment relationship function together. The former is the risk aspect, where this risk is assigned to either the employers or the employees depending on the choice of pension design. This angle of analysis becomes particularly interesting given the fact that the employers have exclusive decision-making power concerning choice of design.

3.4 Structure

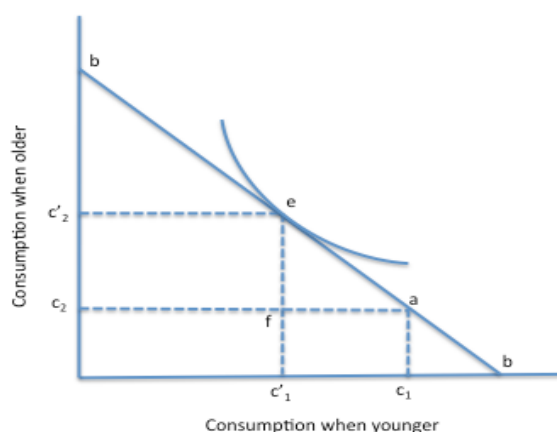
Chapters 4 and 5 provide the theoretical perspectives on pensions as well as an overview of the Norwegian pension system. These chapters also elaborate on how occupational pensions relate to the other components in the pension mix. Chapter 6 provides the problem definition, where the case is made for why and how risk manifests itself through the two pension plan designs. Chapter 7 provides an elaboration on the research methodology, data material and ideal types used in the analysis conducted in Chapters 8 and 9. In Chapter 10, the case is made for why pensions are controversial whilst at the same time a normative discussion on the benefits for different groups is provided. Chapter 11 provides the concluding arguments and suggestions for interesting further research in the field of occupational pensions that have not been addressed in working with the thesis.

4 Theoretical perspectives on pensions

Income is vital for all members of any society, whether in the form of physical resources like food, shelter or medicine, or in the form of financial resources to purchase the above goods in the market. In a welfare state like Norway, income can be divided into phases, according to generation or age. In their youth, individuals gain their income through the parenting generation. Thereafter, they enter the workforce and earn their income through an employment relationship. At retirement, income needs to come from another source, and that source is called pensions. According to Nicholas Barr, pensions serve one main purpose; income security in old age, and the vital factor concerning pensions is output in years after retirement.

In theory, providing this income security is rather straightforward. A simple Fischer model of rational behavior illustrates the choices given an initial income given by point a. This income level yields a consumption of c_1 during his/her working life and subsequently c_2 in retirement. From the model, these consumption levels produce the lifetime budget constraint b-b. By saving for the future, the individual can increase the number of choices, for instance by saving $c_1 - c'_1$ during the period of employment, thereby increasing consumption in retirement from c_2 to c'_2 . In this simple illustration, the utility function is maximized in point e, yielded by saving $c_1 - c'_1$ during employment and consuming c'_2 in retirement.

1. Rational choice in a Fischer model



Reproduced from (Barr 2001, 12)

The example above is stylized, simplified and rests on strict assumptions like a well behaved utility function, rational behavior, absent uncertainty and a competitive market in service provision (Barr 2001). Assuming certainty in decision-making rules out random events like inflation and changes in a nations' demographic composition. In a reality with perfect information, voluntary saving in a competitive market of private financial institutions provide sufficient resources for future consumption and thus provides the efficient outcome (Barr 2001). This also removes part of the rationale and *raison d'être* for the welfare state. This is, however, not the world as we know it. We are surrounded by uncertainty and information asymmetries concerning most elements feeding into our future needs. Changes in demographic composition are a reality, and it needs to be accounted for when addressing retirement income. Together with demographic changes, information asymmetries and volatility in financial markets and uncertainty surrounding longevity relaxes the above assumptions and suggests a more complex situation and that the simple Fischer model of rational behavior does not produce efficient outcomes, but pave the way for other mechanisms of facilitating consumption in old age (Barr 2001).

4.1 Delivering on the purpose: Objectives of pensions

The overall objective of pensions can be provided in two ways (Barr 2001). One is storing current output, like tin can food, and the other is accumulating claims for income in the future. Some of the classic discussions on pensions revolve around the logic of storing current output, and several arguments are made for why it is an inferior approach to income post retirement (Barr 2001). The opportunity costs to storing an output is manifested in several ways. One element is missing out on gaining financial interests and interests-upon-interests. The second is the sheer costs of storing resources for future use. Changes in future preferences, quantitative needs and physical tolerance to food and medicine are unknown to the individual, leaving the needed volume in storage unknown. The opportunity costs, direct costs, possibly changing preferences and tolerance all speak against the storage alternative as a vial alternative to securing income at old

age. This leaves us with the logic of accumulating a future claim on retirement income, and this approach will be expanded upon throughout the thesis. Under future claims, pension provision can be organized along two dimensions: Defined-contribution and defined-benefit, where the latter can be financed through funding or through running expenses. These elements of the pension system are vital for the problem definition and research question, and will be returned to and thoroughly addressed in Chapter 6.

The objective of securing income at old age is divided into three subsequent elements; invalidity relief, poverty alleviation and consumption smoothing (Barr 2001, 89). Consumption smoothing is a concept used to describe closing the income gap that arises when an individual goes from paid work into retirement. Absent pensions, such an individual would go from NOK X in annual salary to NOK 0 at the time of retirement. Having adopted a particular lifestyle makes it important to maintain a certain income even after exiting the workforce. Through minimum arrangements in the Norwegian, or Nordic, welfare state model, arguments can be made that the former two are taken care of by the social systems set in place. Similarly, one can conceive of the responsibility for consumption smoothing at time of retirement as addressed by the employment relationship, as well as funds accumulated through the individual pension savings components of the system. These elements are elaborated upon in the next chapter, where the Norwegian pension system is addressed and the case is made for why occupational pensions are important. In addition, perspectives on its future importance are provided, as demographic shifts continue to manifest themselves and influence pension provision.

4.2 The concept of risk

As mentioned in the introduction, a key concept for this thesis and its problem definition is risk. The term can manifest itself and be conceived of in several ways, thus a clarification may prove beneficial. In estimating future claims on production and thereby retirement income, macroeconomic shocks and inflation, demographic changes manifested in an aging population and political risks in the form of systemic changes may all be interpreted as risks. Nicholas Barr classifies

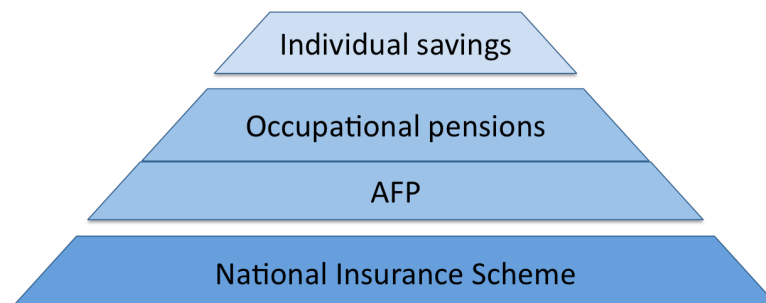
the concepts above as uncertainties, arguing that risk, in the form of management risks, investment risks and annuities risks are handled through actuarial mechanisms for risk management (Barr 2001, 92). For the purpose of this thesis, what Barr refers to as uncertainties will be labeled as risks. A thorough discussion of risk connected to capital management, investment risks or risks associated with the annuities market belong to the sphere of financial economics and financial management. As a contribution within the field of political economy, this thesis will focus on events unaffected by actuarial standards as well as principles of financial management. Macroeconomic events like inflation as well as changes in demographic composition are thoroughly addressed in later chapters of the thesis. In addition to these components, political risk is also an important factor to include, as policies determined the scope of activities as well as minimum requirements and maximum caps on products, service provision and division of risk.

Political shocks can in many respects help to explain the macroeconomic events like the ones briefly mentioned above. Political shocks can be grouped into two categories (Carmignani 2003), where the first contains socio-political disturbance like mass violence, civil war and assassinations. In no respects is Norway immune to such events, but history has proven that the country is little prone to them taking place. Due to its limited probability, the thesis will attain little focus to this dimension and rather focus on instability due to unexpected electoral outcomes and terminated governments. Such events are arguably much more likely in a modern welfare state like the Norwegian, and political history is riddled with uncertainties stemming from disputes and gridlocks on the political arena. A vast literature exist on how politicians seeking re-election manipulates fiscal and monetary policy instruments in order to improve on unemployment and growth, and thereby remain in office (Nordhaus 1975; Hibbs 1977; Lindbeck 1976). Central bank independence is intended to curb influence from myopic political objectives, but business cycles are argued to remain problematic even still. Even without direct manipulation of the policy instruments, uncertainty on electoral outcomes produce business cycles affecting output and production, thereby potentially driving inflation (Carmignani 2003).

5 Historical background: The systemic structure

The Norwegian pension system comprises three components. The first is the old age care supplied through the National Insurance Scheme. This component of the pension mix ensures a minimum level of retirement income, independent of income level and tenure in working life. The second component of the pension mix is connected to an employer-employee relationship, where the employer contributes to a future retirement claim by the employees. The third component in the pension system in Norway is the individual pension savings component. As the name suggests, this part of the retirement income stems from the individuals' personal savings throughout life prior to retirement. The system can be conceived of as a pyramid, illustrated in illustration 2, where the base is supplied by the state, the middle level is strictly speaking supplied through employment and the top level is an individual responsibility. The thesis will now go on to elaborate on the three elements of the pension mix in greater detail.

2. The Norwegian pension system



5.1 The National Insurance Scheme

The bottom level in the pyramid consists of the National Insurance Scheme. This component is guaranteed individuals with Norwegian domicile, employment in Norway and on the continental shelf, or Norwegian citizenship working abroad (Lov 28. februar 1997 nr. 19 om folketrygd 1997). The National Insurance Scheme provides a minimum guarantee of retirement income. It was founded in 1967 as a single coordinating unit for various initiatives and schemes intended

with poverty alleviation, disability benefits, etc that with time came to incorporate all Norwegian citizens. Since 1967, all legislation concerning these different schemes have been incorporated in “Folketrygdloven” (Lov 28. februar 1997 nr. 19 om folketrygd). The scope of the law is provided in the intentions paragraph, stating that:

“The intentions of the National Insurance Scheme is to provide economic safety by securing income and compensating for certain expenses connected to unemployment, pregnancy and birth, sole custody, illness and injuries, disability, old age and death. The National Insurance Scheme shall contribute to leveling-out of income and living standards through the individuals’ lifespan and between groups of individuals. The National Insurance Scheme shall assist in self-help, with the objective that the individual is so support him-/herself and as best as possible get by in their daily lives” (Lov 28. februar 1997 nr. 19 om folketrygd, §1-1).

The law is comprehensive in its inclusion and paragraphs 2-1 through 2-4 stipulates that having legal Norwegian domicile, being employed in Norway, on the continental shelf or other Norwegian territory, or being from an European Economic Area (EEA) member state and working in the petroleum sector provides coverage under the National Insurance Scheme. In addition, §2-5 provides additional circumstances for membership and §2-6 regulates partial membership in the arrangement. Voluntary membership is also available and regulated in various sections of §2.

Prior to January 1st 2011, old age pensions in the scheme were calculated as a base layer provided to all and an additional pension accumulated through working years with a general pension age of 67 years (Hippe 2009). The additional pension component vested by 1/30 every working year between the age of 16 and 66, using the best 20 years (measured in income) as basis for the calculations of the level of life-long pension from the date of retirement. This still applies for members of the scheme born prior to 1953. Individuals born in 1963 and after will be fully enrolled in the new accumulation model, whilst those born between 1954 and 1962 will accumulate under a proportional hybrid model (Hippe 2009). The new model for the National Insurance Scheme departs from the old one in that it

uses all working years to calculate the basis for the pensions, with an upward accumulation limit of 40 years. In addition, it avails of life expectancy rates at the age of 61 to calculate the annual pension received at retirement (NAV 2012b). This entails that as the population grows older, the pensions become smaller, given maintaining the retirement age. The National Insurance Scheme is financed over the national budget. As such, and all else equal, increases in life expectancy will amount to larger future pension payments. The Norwegian Sovereign Wealth Fund cannot be used to fuel this increase, due to the inflation targets at the basis of the Norwegian national economy. This leaves taxation as the only feasible source of funding in a scenario as described above. This implies several problems, the first and foremost being the “baby boomers” born between 1945 and 1962 by far outnumbering the preceding generations. This implies a significant transfer from the working population to the population in retirement. The pension reform in force from January 1st 2011 is intended to limit such transfers, and attempts to induce a shift in retirement age simultaneous to the shifts in life expectancies.

5.2 The employment-based component

The second layer in the pension system is intended to further bridge the income gap. It consists of accumulation through an employment relationship and has two components. The first component is the AFP early-retirement scheme, which is a component facilitating early retirement and from 2010 it is given as a continuous supplement to the pensions provided by the National Insurance Scheme (Lov 19. februar 2010 nr. 5 om statstilskott til arbeidstakere som tar ut avtalefestet pensjon i privat sektor). The minimum age for early retirement is 62 years and the AFP-supplement is then provided, independent of whether the individual decides to remain employed. This provides an improved flexibility compared to previous arrangements concerning early retirement from the workforce. Under AFP, the employer accounts for 2/3 and the state for 1/3 of the costs associated with the arrangement (Hippe 2009).

The other component of the second layer is occupational pensions – funds or future claims accumulated through an employer-employee relationship. Legislation obliges employers to sponsor their employees with funds to future

pensions. The scope and reach of the legislation is given in the intentions paragraph, stating that the law applies to employing organizations having

“at least two individuals, both with working hours and salary levels equaling 75 percent of full employment or more, at least one employee without ownership interests in the business with working hours and salary level equaling 75 percent of full employment or more, and employed individuals each with minimum 20 percent of full employment and constituting at least two FTE’s” (Lov 21. desember 2005 nr. 124 om obligatorisk tjenestepensjon, §1).

shall be included in an occupational pension plan for all its eligible employees. As follows the legislative text and the intentions of the law, occupational pensions are employment based and covers only the individuals partaking in the work force. The design of occupational pensions is further legislated by “Lov 24. november 2000 nr. 81 om innskuddspensjon i arbeidsforhold (Innskuddspensjonsloven)” and “Lov 24. mars 2000 nr. 16 om foretakspensjon (Foretakspensjonsloven)”. This is due to the fact that there exists two main designs in pension provision, each with distinct features needing explicit and specific legislation. Pension design is an important element of this thesis and will elaborated upon in greater detail in Chapter 6.1.

Occupational pensions have existed in the Norwegian market since the beginning of the 20th century, and their evolution can be divided into six phases (Veland and Hippe 2008):

1. 1911-1950: Early phase.
2. 1950-1970: Establishment of broad pension coverage.
3. 1970 through 1980’s: First growth period.
4. 1985-2004: Stagnation.
5. 2005-2010: Second growth period and market transformation through legislation to mandatory inclusion.
6. 2010 –: Continued transformation and focus on collective arrangements. Mapping possibilities for pension design innovations.

The early phase covers the establishment of occupational pension plans and their early tax incentives. The plans were introduced for clerks and public officials and the Tax Law of 1911 provided tax deductions leading to the creation of the National Public Service Pension Fund in 1917 (Veland and Hippe 2008). Changes in coordination with the national pensions and the principle of proportionality paved the ground for including all levels of the workforce into the pension plans. Nevertheless, only approximately 200.000 people were included in an employment-based pension arrangement at the end of the 1960's. The creation of the National Insurance Scheme in 1967 marked a crossroads for Norwegian pensions. It created the foundation for a rapid expansion thanks to public sector enrollment, guarded by law for state employees, and by tariff agreements between the negotiating parties in the municipal sector. Private sector employees were also included in occupational pension plans, but full coverage proved difficult to reach. This created a divide where public sector employees became known as the "pension nobility" and about 50 percent of private sector employees were left to themselves concerning pension accumulation. In order to counter such effects defined-contribution plans were made equally tax deductible to defined-benefit plans.

In the fifth phase, legislation made occupational pensions mandatory, fulfilling the desire of full coverage to prevent the divide over private/public sector employment. The legislative measures and reforms the past few years should be seen as political attempts to bridge the gap between the 'have's' and 'have not's' concerning occupational pensions. Making the two pension designs equally tax deductible also reduced the entry barriers for companies previously without a plan. This period also saw a shift away from defined-benefit plans through transitions and closed end plans for new employees. Making occupational pensions mandatory obviously implied a surge in number of plans and capital under management, and at the same time the National Insurance Scheme reform attached an increased salience to occupational pensions given its life expectancy adjustments and changes in the accumulation model. These changes should be seen as a shift to a system where the workforce is less burdened by increasing cohorts of retirees through the taxation model. The employer-sponsored nature of the pension component also underlines this effect away from a pension provision financed through taxation.

The last, and current, phase identified by Veland and Hippe is perceived to have a focus towards broader collective agreements as well as including them into the tariff agreements (Veland and Hippe 2008). Such a development would bring the Norwegian pension second level into line with the other Scandinavian countries in that pensions would obtain an increased role in the perception of the population through being included in wage negotiations. This would in turn lead to a further self-financing within cohorts and alleviate the taxpayers from increased cohorts in retirement.

5.3 Individual pension savings

The third component in the pension pyramid is the individual savings accounts. These are nothing other than accumulation vehicles taking several forms. All the main private institutions in the pension industry in Norway offer such products that most often take the form of funds or high-interest savings accounts. The voluntary nature of the individual component has led to its limited adoption and subsequent limited funds under management from the perspective of the insurance companies. Legislation stipulates that total annual contribution is limited upwards to NOK 15.000, including all management and administration fees. It also maintains that provision of pension *insurance* agreements are strictly limited to life insurance institutions, whilst provision of pension *savings* agreements are open to all banks, life insurance institutions, fund providers and pension institutions within the EEA (Lov 27. juni 2008 nr. 62 om individuell pensjonsordning).

Whilst the other two levels of the Norwegian pension system have characteristics of vesting claims on future income, the individual component is nothing but a savings vehicle. What separates this level of the pension system from other accumulation vehicles like funds or high interest savings accounts is first and foremost the earmarking (minimum one third) to future pension. Second comes the introduction of certain incentives in order to promote savings in these products and add to the total available funds at the point of retirement, amongst them tax incentives, postponed dividend tax and cost exemption when switching funds.

5.4 Summarizing the arguments

Together, the three aforementioned components provide Norwegian citizens, within and outside the workforce, with poverty relief, income insurance in cases of disability or old age, as well as consumption smoothing, in order to bridge the economic gap between working years and retirement. As the able reader will have noticed, the above sections have mentioned a shift from a pension provision placed upon members of the workforce towards a regime where each cohort, or indeed individual, finances their/her own retirement income. Working with pensions offers researchers vast amounts of angles and problem definitions. The sections above have only provided a limited and condensed illustration of the pension system, as a thorough elaboration would be far too demanding and extensive for the purposes of this thesis. Much of the evolution in the field of pensions in Norway in later years has been targeted to the second layer. Product innovation is a focus area both from the legislating authorities and the life insurance companies providing the occupational pension plans. The Banking Law Commission recently published their report of June 28th 2012 on the possibilities for hybrid pension plans (Banklovkommissjonen 2012), further optimizing the divide in responsibility and risks in order to further maturing the pension market in Norway. As this thesis will elaborate on at a later stage, such developments would further provide to bridging the income gap at retirement and maintaining the costs of funding the pensions to its beneficiary cohorts and individuals.

6 The problem

As a research contribution, the thesis needs to depart from a specified problem definition and from there produce a research question or hypothesis. This section of the thesis is intended to supply the reader with a thorough understanding and definition of the problem at hand, namely that defined-benefit pension plans produce uncertainty for the plan benefactor. The concrete research question for the thesis is provided in Chapter 7.2. By analyzing the decision-making landscape and the various perspectives on pensions, the following chapter will provide a single, unitary argument. This argument is that defined-benefit pension plans represent unknown factors in financial planning from the position of the employers. Whilst defined-contribution produces perfect rationality in long-term financial planning, defined-benefit offers no such promises.

6.1 Pension design

Regarding occupational pensions, design is crucial for the division of risk amongst the actors involved as well as the legislation governing investment mandates and requirements placed on service providers. As of 2012, the Norwegian pension legislation and regulation opens up for two different main designs. The thesis will now elaborate on these two in detail, as well as the lines of separation and mechanisms for funding. The thesis will start by account for defined-contribution occupational pensions.

6.1.1 Defined-contribution

Defined-contribution schemes have the properties of pure savings agreements. The logic is that the plan sponsor contributes a pre-defined percentage of annual salary to a pensions account on behalf of the employee. As such, and as the name implies, the contributions from the employer is defined, not necessarily what the employee receives in pensions at the point of retirement. With a defined-contribution plan, the annual pension received after retirement consists of the total funds in the account, divided by the number of years pension is to be paid (minimum of 10 years according to the covering legislation). The total balance in the account comprises of the premiums paid throughout the allocation period,

minus costs (asset management and/or administrative fees), plus the returns to capital from the investment decisions made.

The funds can be invested in several ways (Hippe 2009). The first is that management is left to the institution with which the defined-contribution plan is purchased, typically a life insurance company. A second option is that a collective agreement on portfolio composition is made between the plan benefactor and the issuing institution on behalf of all members. A third option is that the individual plan beneficiary decides on an individual investment design within the legal framework in place. Legal requirements stipulate that the duration and profile of pension payments to retirees are to be included in the contract. These may be annuities or other insurance-inspired products purchased with the same provider or a competing institution. This is typically also included in the contract.

Defined-contributions plans are separated from the National Insurance Scheme, and the accumulated funds are a supplement to the nationally provided pensions. This, as we will see, is somewhat different concerning defined-benefit schemes, where gross guarantee pension plans are coordinated with the publicly supplied pension provision. Despite the lack of a direct coordination mechanism between the national pension and defined-contribution, the accumulation limits and trajectories produce a (socially desired) pension level taking salary levels into consideration. The mechanisms here are the contribution caps of 5 percent annual savings rate between 1G and 6G (1 G = Base amount, NOK 79.216 per 2011-adjustment) and 8 percent savings rate between 6 and 12G. Salaries exceeding 12G are not required by law to contribute to pensions, as such contributions are not tax incentivized through deductibility on behalf of the plan benefactor. Additionally, the minimum contribution rate is pinned at 2 percent of annual salary in the entire range from 1G up until 12G. In the Norwegian context, these salary and contribution levels are also highly uncommon (Veland 2010, Figures 4 and 5), and the implications are therefore minuscule.

6.1.2 *Defined-benefit*

Whilst defined-contribution pensions have properties of a savings arrangement, defined-benefit plans resemble an insurance arrangement. Instead of the contributions made by the employer being agreed upon, the plan defines the compensation received post retirement. The level of compensation is typically set to a percentage of salary in the final working year, subject to adjustments for decreasing salary trajectories in the last 10 years of employment (Lov 24. mars 2000 nr. 16 om foretakspensjon 2000). The German welfare state under Otto von Bismarck introduced 2/3rds of salary as a guiding principle in the 1880's – a principle still witnessed today where 66 percent is a returning defined-benefit at the time of retirement. Also at the center of defined-benefit is the qualifying period, or years of services, defined by law to be minimum 30 maximum 40 years of service (Lov 24. mars 2000 nr. 16 om foretakspensjon 2000).

Legislation in place dictates what is referred to as linear vesting, meaning that an equal amount of the total pension is accumulated every working year. For an individual starting work at 35 and working until 65 will vest 1/30 of his/her pension each and every year. Defined-benefit plans can further be divided into (modified) gross defined-benefit agreements, net defined-benefit agreements as well as marked-up benefit (ytelsesbasert påslagsordning) agreements (Hippe 2009). Whilst gross guarantee defined-benefit agreements guarantee pensions equaling a certain percentage of final years salary and is coordinated with the National Insurance Scheme and AFP (Avtalefestet Pensjon), while the net agreement is not coordinated but comes as a supplement to these arrangements. Both the gross and net agreements are based upon a pre-defined qualifying period, in most cases 30 years. The marked-up benefit agreement is identical to the net defined-benefit agreement except from the fact that all employed years produce the foundation for calculations, instead of for instance 30 years, as may be the case in the gross and net defined-benefit agreements.

Similar to a defined-contribution plan, there are caps on the pensions in a defined-benefit plan. "Foretakspensjonsloven" stipulates that maximum occupational pension provision for an individual earning between 1G and 6G is 100 percent of the salary level at work force exit, while the cap when earning from 6 to 12G is 70 percent (Lov 24. mars 2000 nr. 16 om foretakspensjon 2000; Hippe 2009). Private

defined-benefit plans are solely funded by the employer, whilst in the public arrangement a small deductible is charged on the employees. For employees covered by the Norwegian Public Service Pension Fund, this charge is typically 2 percent of annual salary. The funding is done through annual premiums that are adjusted according to interest rate levels, salary projections and trajectories and returns to capital on the funds already accumulated. As Veland (2010) notes, lower interest rate levels imply an increase in the future value of the claim on the plan benefactor, thereby increasing the premiums paid today. Similarly, wage increases result in upward adjustments in the premiums, as the already contributed premiums needs to be adjusted accordingly (Veland 2010).

6.1.3 Accumulation of claims: PAYG vs. funding

Defined-benefit agreements can be organized according to two different principles. PAYG are most often state-run (Barr 2001, 91), and they represent direct transfers from the work force to individuals in retirement over the national budget. In state provision, increases in obligations can efficiently be financed by tax increases, instead of dividends from investments. In essence, PAYG therefore implies that running expenses to pension provision is financed through running income. In a private corporation with a defined-benefit pension plan for its employees, the expenses for pension provision are taken from revenue and the financing implies that former employees have claims on current operations and revenue.

For a private company, a plan benefactor, the PAYG mechanism is referred to as “book reserves”, and is a pension accumulation vehicle with proven disadvantages. The first and foremost is the protection of the current and future pensioners in the case of a bankruptcy. With no funding mechanisms and a bankruptcy, the pensioners are left without an occupational pension. This was exactly what happened with Tandberg Radio during its bankruptcy in 1978 (Grønvik 2006). Products providing insurance from such events are available in the market, but the strict regulation, and connected costs from purchasing guarantees, in place to prevent similar situations like with Tandberg Radio make “book reserves” a method without support in the private sector. As we will see, with the possibility to levy through taxes, states still make use of the PAYG

principle for financing pensions. The return to capital argument is made more and more evident also in national pension provision in recent years, precisely due to inevitable taxation increases as demographic shifts increase the pensioner-to-working-individual ratio. Also, improvements in real income affect the pension provision, as benefits provided do not have to match contributions to the same provision. This is one of the main drawbacks with PAYG systems, one that increases the benefits-to-contributions ration to more than 1 (Barr 2001, 2004).

The other approach to structuring future claims is through funding. Funding has the advantage that returns to capital can be made, thereby positively affecting the already-made contributions to the pension “fund” and thereby decrease premiums paid by the employers. The Financial Crisis Commission illustrates the perception on the two financing systems by reporting that private defined-benefit agreements in Norway are fully funded (Finanskriseutvalget 2011, 96). This must be seen as a testimony to the superiority of such a financing model, and the thesis will now direct its attention to the mechanisms of funding defined-benefit agreements. For the remainder of this thesis then, private defined-benefit plans will be treated as fully funded.

6.1.4 Defining traits and comparisons

The deciding factor for choosing between a pension design are the differences between the two types when it comes to features influencing the financial planning of the plan benefactor. At the center of this debate is the concept of risk – risk of what, and risk for whom. With a defined contribution plan, the employee must face the risk of negative returns to capital and thereby lower pensions in the years post retirement. At the same time, longevity risks imply that an individual can be left on the minimum level of pension provision if the funds are allocated along a 10-year annuity and the individual lives for 15 years after retirement. With a defined-benefit plan, the situation is different. Regardless of life expectancies, the defined percentage of salary is to be received, thereby removing the risks connected to longevity. The risks in the capital markets are also removed, as market mechanisms do not affect the size of the pensions paid at retirement in such a plan. These abovementioned effects concerns the employee-side of the arrangement, and for the employers things are the exact opposite. As

unpredictable in future outcome the defined-contribution plans may be for the employees, as predictable and easily managed are its affiliated costs to the employer. The employer has full rationality given a set percentage of salaries to be contributed annually and is fully predictable in long term financial planning. Defined-benefit plans on the other hand produce the opposite situation. Pensions are to be provided throughout life, and premiums have to be adapted when life expectancy at the time of retirement increases. It was previously the case that DB plans allowed tax deductions on the premiums paid, whilst no similar advantages were attributed to DC plans. This discrepancy was removed with the Law on Mandatory Occupational Pensions in 2006, allowing deductions on premiums and contributions to DB and DC plans alike and removing the incentives based on tax advantages.

This thesis is concerned with the plan benefactors. In that respect, defined-contribution agreements are relative straightforward as the thesis has already illustrated. Defined-benefit agreements on the other hand represent uncertainty for the employer-side of the relationship concerning occupational pensions. In order to maintain momentum in its build-up, the thesis must therefore pose the question. Do DB plans uncertainty for the employer, and why? The answer to such a question is: “Yes, through two main mechanisms; longevity risks and interest rate levels”. The thesis will elaborate on this in further detail in the next section and start with the mechanisms.

6.2 Longevity risks and interest rates

This section goes straight to the core of several questions concerning pensions, savings and long-term planning – this core being that we do not know for how long we are going to live. Longevity risk is associated with the risk that future mortality and life expectancy outcomes turn out different than expected (Antolin 2007). On a global scale, life expectancy has increased by 25-30 years the past century (Antolin 2007). In a similar vein, life expectancy in Norway has increased by six years for males and three years for females over the past 25 years (Statistics Norway 2011). Improved life expectancy rates do not pose a challenge in itself, but the uncertainty connected to it does. Keeping the *total* sum of pension after

retirement constant, increasing the number of years until passing away reduces the annual pension paid to a given individual. This is the defined-contribution logic. Keeping the *annual* pension constant and increasing the number of years alive, increasing the necessary sum of funds to cover for the institution and the plan sponsor. This is the defined-benefit logic.

From a financial standpoint, longevity risk is not concerned with an increase in life expectancy for a given individual or cohort, but with the uncertainties and costs connected to financing the extra pension years (Milevsky 2008). Milevsky cites Olshansky and Carnes in that there exist an upper bound for life expectancy, whilst Oeppen and Vaupel (2002) debacle this by pointing to a steady and continuous increase in life expectancy rates the past 160 years. No agreements exist over the biological limits to life, and this uncertainty is non-exclusive. Statistics Norway provides projections on life expectancy in order to adjust pension accumulation to a longer life. As these expectancies evolve, the strike point providing the expectancies becomes a factor. If a life insurance company plans its defined-benefit plan costs by using the life expectancies at the age of 65, these may be different than if the expectancies at age 67 were used as a basis for calculations.

Interest rates are more or less impossible to predict over the long term. On a short-term basis, Norges Bank produces projections on macroeconomic developments including the sight deposit rate (Styringsrenten) in its Monetary Policy Reports. The latest report shows how the path projections towards 2015 have been significantly changed in the latest three quarters (Norges Bank 2012c). This underlines the difficulties in projecting interest rate levels, since the influencing factors are vast in numbers from domestic and abroad. A simple analysis of Norges Bank's monthly average sight deposit rates the past 20 years displays vast diverging levels. Whilst the monthly average in the period is a sight deposit rate of 4.5 percent, the lowest interest rate level since March 1992 is 1.25 percent. Similarly, the highest level is 10.87 percent in October 1992 (Norges Bank 2012b). The difficulties concerning the defined-benefit plans comes from its interest rate guarantee defined by law (Lov 24. mars 2000 nr. 16 om foretakspensjon 2000, §9-3) and specified in the specific agreement. This implies that the insurance companies have an obligation to provide the pension

accumulation with at minimum return to capital every year. Returns exceeding the given percentage fall to the future pensioners, whilst the issuing institution covers a potential return below the agreed percentage. If the interest guarantee is 4 percent and the interest the insurance company can get from a bank deposit is 4.5 percent, then a secure bank deposit takes care of the interest guarantee as well as it provides a dividend to the funding. Understandably, an interest rate level of 2 percent implies that the insurance company must work harder in order to meet its obligations, while at the same time they want to minimize the risks of falling short on the interest rate guarantee.

The regulatory capital requirements placed upon the insurance companies further underlines the interest rate argument. The industry actors are obliged to maintain a capital base corresponding to the size of the future pension liabilities December 31st every year. This implies that the investment horizon becomes a lot shorter than for other institutional investors in the financial markets. When a one-year put option is twice as expensive as a five-year put option, the implications for the plan benefactor increased premiums to the insurance companies managing the pension agreement. The thesis will now go on to elaborate on these two factors, so important for the premium calculations.

6.2.1 Interest rate guarantee

By law, life insurance institutions providing defined-benefit plans are obliged to maintain sufficient capital reserves to meet future liabilities. These requirements include the obligation on the part of the institutions to maintain premiums at a sufficient level in order to build the reserves. This is then again filtered directly to the pension plan benefactors. When calculating the premiums needed to meet future defined-benefits, a certain return to capital is demanded from the funds (Hippe 2009). The return is labeled as ‘calculation interest rate’ or interest rate guarantee. The interest rate guarantee is the minimum level that the life insurance companies are required to deliver in terms of annual returns to the funded pension accumulation. A low interest rate guarantee yields lower premiums for the plan benefactor, given that the financial institution can provide a return above the guarantee. As return to capital is positively connected to portfolio risk, a

maximum level is placed on the interest rate guarantee. The current interest rate guarantee is 2,5 percent, effective from January 1st 2012 (NHO 2010).

Due to the interest rate guarantee, the life insurance companies are inclined to have investments with low interest rate sensitivity in order to prevent too much volatility in annual return to capital (FNO 2012). All of the above indicate a downward adjustment of risk (NHO 2010) and thereby an upward adjustment on the premiums paid by the plan benefactors. This risk argument implies that a significant fraction of the funds under management are held in interest rate products and bonds. The financial crisis and its effects are likely to maintain low interest rate levels for the foreseeable future, including in Norway. This implies that pension funds invested in interest rate products experience difficulties in delivering the required returns. This was the argument behind the latest decrease of the interest rate guarantee, a change that is estimated to have cost Norwegian employers in the area of NOK 5 billion in increased premiums (NHO 2010). This was a change arguably good for the pension providers, but equally poor for the employers.

6.2.2 Capital requirements

Together with the interest rate guarantee, the capital requirements implies life insurance companies have a shorter time horizon (Andersen 2003), leading to less return on equity and higher premiums for the plan benefactors. Detailed information on the specific requirements and their calculation is not beneficial here, given the scope of the thesis. However, their brief mentioning is important in order to cement the case for volatile premiums. The requirements under Basel II and Solvency II (expected executed January 1st 2014) imply that more capital reserves are needed as the risk, and thereby prospects of return, are higher. For an extensive elaboration on the capital requirements, see NOU 2004:24 (Banklovkommissjonen 2004). Put simply, investing in equity is riskier than OECD government bonds and bank deposits. This increased risk is reflected in requirements to have higher capital reserves available (Andersen 2003). The trade-off thus becomes one between holding funds and providing higher returns for the pension plan holders. A downside where the financial institution needs to cover all the losses whilst compared to an upside where the plan beneficiary

receives the return is easily reflected in a rather conservative investment mandate and rigid control over the capital reserves needed at any point in time.

6.3 Pension provision

Norwegian law dictates who can and who cannot provide occupational pension plans. Concerning defined-contribution plans most financial institutions like investment banks, investment funds and life insurance institutions can supply the employers with a plan for their employees. The strict capital requirements and interest guarantees surrounding defined-benefit pension plans narrow the provisionary scope substantially, limiting service provision to life insurance institutions and public pension organizations. An easy way to classify service provision is through a public/ private divide. For private sector employers, pension provision is maintained through private sector service providers. Opposite, for public sector employing organizations, public institutions handle the service provision. There are exceptions to this dichotomy, where public institutions offer pension plans to employees in the private sector, but in general this is the scope of the pension industry in Norway. Employers in the municipal sector are included in pension schemes with KLP (Kommunenes Landspensjonskasse) and state level employees are included in the Norwegian Public Service Pension Fund (Statens Pensjonskasse). The Norwegian Public Service Pension Fund is financed through the PAYG model, offering several challenges to plan benefactors.

Whilst the Norwegian Public Service Pension Fund is designed to manage pension funds for civil servants, other groups are also included in its scope. Teaching personnel for one, are eligible for inclusion, offering one challenge in particular. In Norway, primary and secondary education, in addition to high schools, is the responsibility of the municipal sector. The responsibility for higher education in Norway rests with the state, implying that universities and university colleges are state run and state financed. In line with arguments made above, the PAYG model can be levied through tax mechanisms when residing with the state. The problem arises when private higher education institutions avail of the opportunity to include its teaching staff in the publicly run pension plans. The

logic is the following: When a university faces increased, unexpected costs from the pension provider, the Norwegian state has mechanisms in place to cope with the increases. When a privately financed, and run, institution faces the same increases in costs, they need to be covered with available capital, for instance from funds intended for purposes like research and development.

7 Research methodology

7.1 Level of analysis

In essence, pension systems are simple and easy to comprehend, but this depends on a crucial factor, the level of analysis. When discussing pensions, this level of analysis determines the discussions and the implications for policy and economic outcomes. Confined to a unitary level of analysis, pension systems can easily be dissected and analyzed, but the problem arises when levels are mixed in discussions and political debates. At the macro level, the system is comprehensive but manageable. It comprises interacting and isolated elements all contributing to securing an income at old age. At the same time it includes taxation issues implying the trade-offs between in-generation financing or providing finances for older generations' retirement income. The macro level, for the most part, concerns itself with economic terms. With economic terms we first come to think of the division of economic risk attributed to groups partaking in the pension system: employers and employees, as discussed above, and how risk is divided between them. Secondly, we conceive of economic terms with respect to the classical perspectives on resource allocation.

At the micro level of analysis, the system is very complex and continuous reforms and amendments to the system make it difficult to draw conclusions. All calculations depend on strict assumptions and mechanisms in financial markets as well as actuarial principles. Choosing such a level of analysis leaves very little ground for generalization unless the assumptions are based on representative samples and common characteristics in design, accumulation rate and coordination with other components of the pension mix. The micro level is very much a question of who is entitled to what. It very often becomes a legal matter of rights subjected to governing legislation and not one of economic outcomes and dynamics on a societal or national scale.

There should be little debate over the fact that both levels of analysis offer important contributions to the theme of pension systems, but what is the superior starting point for analyzing risk in pension systems? As with research on most political and economic systems, the answer is that "it depends". It depends on the

unit of analysis, whether it being an individual person, a group of companies or the nation state. For the purpose of this thesis, it will avail of a research framework based upon hybrid level of analysis. This should not be interpreted as a mesoeconomic level in the terms proposed by Dopfer, Foster and Potts (2004), but as a means to produce detailed accounts of risk division within a larger complex system as is the case with the Norwegian pension system. The level of detail needs to be sufficient in order to produce actual effects from changes in life expectancy and salary levels, but not to the extent that the thesis turns into a discussion on assumptions behind the calculations. The analysis needs to be conceived within the macroeconomic reality, as microeconomic conclusions yield little validity without them. The argument set forward by Nicholas Barr is that microeconomic analysis of asymmetric information and uncertainty at the micro level is incomplete unless placed in a macroeconomic context (Barr 2001, 89). At the same time, this thesis will argue that the effects of the system is best illustrated through individual examples of companies subjected to actual constraints and obligations placed upon them by the system.

7.2 Research question

Throughout Chapter 6, the thesis has attempted to define the problem with which this master thesis is occupied, namely that defined-benefit pension plans produce uncertainty for the employing organization. In order to narrow the scope down even further, this has to be specified into a concrete research question. In order to operationalize and identify the interesting traits of aspects surrounding pension, research questions are necessary in order to provide clear guidelines and restrictions for a subsequent analysis section. The thesis therefore proposes the following research question:

“How is an employing organization affected by pension system design, and how do defined-benefit pension plans affect the organization’s rationality and certainty in long-term economic planning?”

7.3 *Research method and design*

The theme and research question of this thesis implies a future orientation and thereby rules out several research methods and designs. Rigid empirical testing through statistical packages becomes impossible, due to inconsistency between the then needed data material and the fact that the research question is dealing with future events. The objective of the research question is to provide in-depth understanding of how pension designs embedded in a pension system affect employing organizations' decision-making rationality through the cost mechanism. Together with the future orientation, the details needed to produce a well-founded analysis speak in favor of using ideal type individuals.

7.3.1 Ideal types

Ideal type individuals, or ideal types, play an important role in social science and is arguably best known through Max Weber's "Reiner Typen Legitimer Herrschaft" (Hagenaars and Halman 1989). The purpose of ideal types is to isolate characteristics separating one group from another, whilst at the same time make sense from a realistic standpoint (Hagenaars and Halman 1989). In the case of defined-benefit pension plans, time until retirement may become an influential variable, one that inflicts different cost projections for the employer. This happens if the real salary levels continue to increase, thereby leading to a higher salary level at retirement for a 37-year-old (P-30) employee than his 47 (P-20) and 57 (P-10) year old colleagues. The thesis also acknowledges the benefits of creating a sex differential in order to capture differences in salary levels between male and female employees. Even though the salary levels for male employees tend to be higher than for their female colleagues, the life expectancy rates for women are higher. If substantial, this may cancel out the salary differential concerning pension payment in the retirement. As mentioned, age is an important characteristic concerning defined-benefit pensions and its accumulation of funds. For this reason, the analysis will define three "cohorts" across the previously mentioned separations. The benefits of using an ideal type over 62 years of age provides little benefit, since the life expectancy for this individual will already have been calculated. Medical advances and improvement in the Norwegian health care system is likely to improve the life expectancy even more in the future, and as such a too long horizon is also desirable to avoid. For these reasons, the

analysis will use types with ten, twenty and thirty years to retirement, covering the aforementioned characteristics, leaving the analysis with 6 types to be subjected to interest rate, salary projections and longevity risks.

When working with ideal types, an oft-used technique is to use and scrutinize chosen cells in a table as above in further analysis (Hagenaars and Halman 1989). This is often portrayed as dichotomies and used to put two types up against each other, producing analysis results along the lines of "Given X, A increases whilst B diminishes, all else equals". This thesis views it to be beneficial to include all the cells of the table in the analysis, thereby producing a more holistic picture of the contributions to costs from the different classifications of staff, sexes and age groups.

7.3.2 *The illustrating organization*

As the thesis concerns itself with impact from system design on employing organizations, a case study could have been used in order to illustrate the effects on rationality in long-term planning. A case study could have been beneficial given the fact that the thesis asks questions of 'how' about "*a contemporary set of events over which the investigator has little or no control*" (Rowley 2002). Nevertheless, using a case study might have blurred the focal point of the thesis, pension system design. For this reason, the thesis has chosen not to use a defined case study in need of elaboration, but rather avail of a conceived organization with assumptions made about it. This provides the analysis with a concrete context within which pension design creates consequences. The inspiration for the illustrating organization in the thesis has been BI Norwegian Business School. The reason for this is that BI Norwegian School of Business displays the interesting case of being a private entity in legal terms, whilst at the same time insuring parts of its employees in a the public arrangement through the Norwegian Public Service Pension Fund. The characteristics used in the thesis may therefore appear familiar to some, and for good reasons. It must be emphasized, however, that since assumptions made in calculations here may differ significantly from reality, the conclusions are not valid for BI Norwegian Business School. Rather, they should be interpreted as general conclusions based upon certain assumptions.

For the purposes of the thesis, the conceived organization is a private educational institution. It is an accredited and renowned institution offering Bachelors- and Masters degrees within the fields of economics and business administration. The institution employs 500 academic staff, with a 50 percent being female and 50 percent male split. Given their status as teachers, all employees are eligible for inclusion in the publicly provided defined-benefit pension plan provided by the Norwegian Public Service Pension Fund, and the employer has chosen to include all employees into the plan. As an institution providing higher education, the organization competes in the market for students and academic personnel. The competitive landscape consists entirely of publicly financed and run universities and university colleges providing similar or identical research opportunities.

Whilst the aforementioned characteristics are important parameters in the competition over the workforce, the organization also competes for students in the educational market. As a private institution, it charges student fees for attendance. Whilst the public universities and university colleges also charge fees, their public nature render these fees minuscule in comparison to the fees charged for an education at our perceived institution. All the educational institutions competing in the market for students and academic staff provide membership in the Norwegian Public Service Pension Fund. The conditions are identical for all members of this arrangement and as such, no differentiation is made across the public-private divide in the organization's nature. The calculations are based upon a number of assumptions concerning salary levels, base amounts, and tenure. These are accounted for in due detail, in the beginning of the analysis in Chapter 8.

7.4 Data

Life expectancy rates are calculated for the different age groups and sexes. The basis for the calculations are taken from Statistics Norway's projections (NAV 2012b). The data indicates an increase in retirement age to counter for increases in life expectancies. However, the data also implies that the time in retirement increases continuously with younger cohorts, thereby placing further strains on pension income. This will be somewhat disregarded, as it does not produce a

different image than what the thesis attempts to provide. As such, the age of retirement used in the thesis will be 67 years. For the purposes of this thesis, life expectancy data is the same for both male and female ideal types. All else equal, a positive shift in the retirement age implies higher costs of a defined-benefit pension plan and a lower retirement income under a defined-contribution plan.

Vital to the future payment of defined-benefit pensions are interest rate levels. As argued previously, increasing interest rates implies an easier task providing the interest rate guarantee and thereby lower premiums due to reduced capital requirements on the issuing institution. The central bank, investment banks and other financial institutions provide certain projections, but these tend to have a short time horizon, often nothing more than 3-4 quarters. In the short term, interest level guiding and expectations set do arguably represent little spread compared to the actual levels witnessed in hindsight. On the longer term, this is not feasible given the multi-factor dependence of the interest rate on several indicators, global and domestic. For this reason, and that of this thesis, trying to make accurate interest rate projections becomes futile and time consuming. The thesis will therefore avail of historical data on interest rates to produce interest rate scenarios for the future. Based on the past twenty years, it will produce best and worst case scenarios as well as an average interest rate. When inducted in the calculations, the extreme values are conceived to have significant effects on the costs connected to funding the pension plans.

The public pension provision is publicly disclosed and available. This implies that fairly accurate calculations can be made, given accurate information concerning salary levels and salary projection. Privately supplied pension plans are customized to the plan benefactor, implying that a simplistic approach needs to be taken towards them in this thesis. Product bundling and economics of scale in procurement of pension agreements is likely to be a key market mechanism, but for the purposes of this analysis, rendered less interesting and is as such kept outside the scope. Average and conceived of rates of defined-contributions will produce a ground for comparison to the defined-benefit regime, exactly what creates ground for an interesting discussion in later chapters.

8 Generating the problem: Defined-benefit plans

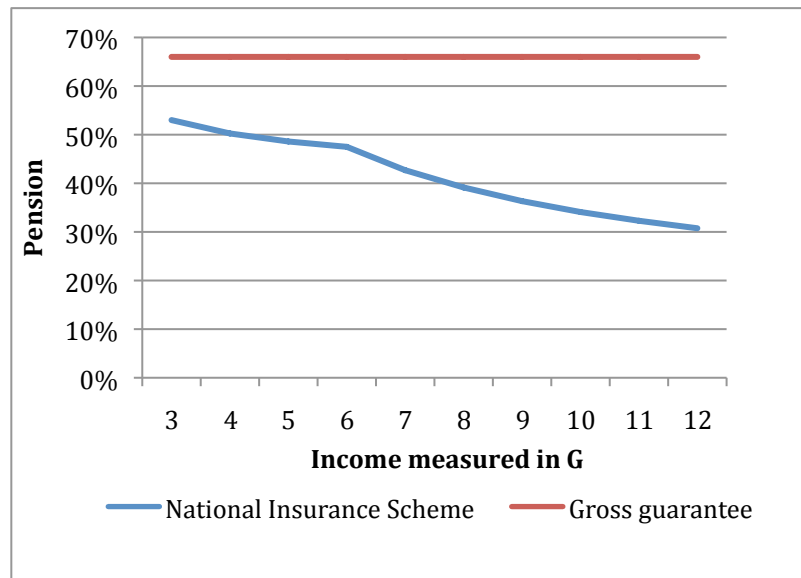
The uncertainty concerning the publicly provided occupational pensions is twofold. First, there are the actuarial cost assessments that are provided for accountancy purposes. The accounting costs include variables like salary adjustments, growth in the base amount, discount rates and expected accumulation of pension rights. The calculations can to a certain extent be affected by the employing organization itself, but only to a small degree. The influence is over what salary expectancy is to be used, but the key cost drivers is the discount rate, which is set universally. Salary adjustments and adjustments to the base amount tend to go in the same direction and may therefore have a cancelling out effect on each other. A good example to illustrate this is the developments since 2001. For both sexes, full-time and part-time employees, average salary has increased by 53,28 percent, whilst the base amount has been adjusted upwards by 54,24 percent in the same period (NAV 2012a; Statistics Norway 2012). The second aspect, and focal for the purposes of this thesis, is the premium component. The annual premium is used to build liquidity in the sense that the employing organization should have a balanced pension plan. What this implies is that the funds and continuous financial contributions made to the pension plan should match the sum of its pension liabilities at any given point in time.

8.1 Cancelling out re-distributional effects

A main difference between the Norwegian Public Service Pension Fund and private pension providers is the fact that occupational pensions provided by private suppliers are not coordinated with the National Insurance Scheme. Occupational pensions in the Norwegian Public Service Pension Fund, however, are coordinated gross guarantee arrangements. This implies that future pension provision is partly based upon the vesting in the national scheme. Recent years amendments and reforms to the National Insurance Scheme have resulted in a system that is said to disfavor those with long education and higher earnings than for instance vocational workers earning below the cap of 7,1G (NOK 562.433). The National Insurance Scheme has a built-in re-distribution logic, implying that the more you earn the less pension you vest through the bottom level of the

pension pyramid. This is illustrated in the graph below, where we can see that there is a clear dip at an income equal to 6,1G. The reason for the dip takes place at 6,1G is that from 7,1G pension accumulation is no longer progressing but rather stagnates.

3. Re-distributive logic in the National Insurance Scheme



The aforementioned gross guarantee implies that the occupational pension component is supposed to cover the remainder of 66 percent of final salary when provisions through the National Insurance Scheme are deducted. Net salary increases after base amount adjustments increase the fraction provided through the occupational pension and implies increased premiums for the plan sponsors.

The re-distributive logic can also be illustrated through our ideal types, but the thesis should first elaborate on the calculations in the National Insurance Scheme before moving on. Retirement income from the National Insurance Scheme is calculated through two main components: Base pension (grunnpensjon) and Additional pension (tilleggspensjon). The former is equivalent to the base amount in the system, currently NOK 79.216. The latter is a combination of income, years of vesting in the system, average employment fraction (stillingsstørrelse) and an element referred to as the retirement percentage. This last point is set to 42 percent from 1992 onwards, whilst prior to this date it was 45 percent. The national retirement income is simply the Base pension and Additional pension put

together. The calculations made to illustrate the re-distributive logic are made based upon the following assumptions:

- All types are married
- The salary level at 37 is NOK 560.000
 - For females this is reduced by 10 percent
- Annual average salary increase is 2.25 percent²
- The economy is free of inflation
- Average employment fraction during employment: 100 percent
- 40 years tenure in the National Insurance Scheme at 67 years

The fact that all ideal types are married is important in the sense that the base amount of 79.216 is reduced by 15 percent for these individuals, adhering to concepts of economics of scale in the household. The reduction yields an efficient base amount of 67.334 for the individuals, thereby reducing the age pension for the ideal types. A reduced age pension from the National Insurance Scheme in turn has consequences for the occupational pension through the gross guarantee. Given the defined-benefit level, the employment based component mix thereby has to account for more of the annual retirement income for married individuals than for unmarried ones.

The calculations illustrate significant differences across cohorts and their different level of supply between the two bottom levels of the pension pyramid. For instance, a 57-year-old male will receive 34 percent of his final salary of NOK 873.000 from the National Insurance Scheme. Our 47-year-old will receive 41 percent of his salary of NOK 699.000 and our 37-year-old receives 51 percent of his salary of NOK 560.000. Due to their reduced salary level, the 7.1G dip does not affect females to the same extent and their support level from the National Insurance Scheme is 37 percent, 44 percent and 55 percent for the 37, 47 and 57 year-olds respectively. The discrepancies by age are due to the fact that when projecting the pension levels, the Norwegian Public Service Pension Fund uses

² Based upon projections by Statistics Norway 2012-2015

current salary level. Due to the gross guarantee a lower percentage of the target level of 66 percent covered by the National Insurance Scheme, yields a higher fraction to be covered by the Norwegian Public Service Pension Fund and in turn, through premiums, the employing organization. As the illustration above illustrates, the level supplied by the Norwegian Public Service Pension Fund increases rather much with aging employees and yields a double effect. In combination with the redistributive logic of the National Insurance Scheme, not only is the occupational pension element responsible for a higher fraction of the defined-benefit level at retirement, but the calculations are also based on increasing salary levels resulting in progressively increasing defined-benefit levels.

The pension reform in effect from January 1st 2011 introduced a new calculation method in the National Insurance Scheme. Although the new calculation method is in effect in the National Insurance Scheme, the Norwegian Public Service Pension Fund uses the previous calculation model where you gain full membership after 30 years. Although this represents a large uncertainty as shown in the calculations above, calculating premiums under the new regime should prove even more uncertain. The question, “what is a full vesting?” will then become interesting as vesting in the new regime is based upon all working years instead of a fixed amount. According to the Norwegian Public Service Pension Fund, a transition into accordance with the new regime can be expected in 2013 or 2014 (Vestby 2012). Also, the premiums paid based on the previous calculation model may prove inadequate to fulfill the obligations at retirement. If an individual accumulates over 45 years instead of 30, then the provisions through the first pillar of the system increases, thereby reducing the need for the occupational pension element. If the accumulation period is shorter than before, then the fraction covered by the occupational pension becomes larger

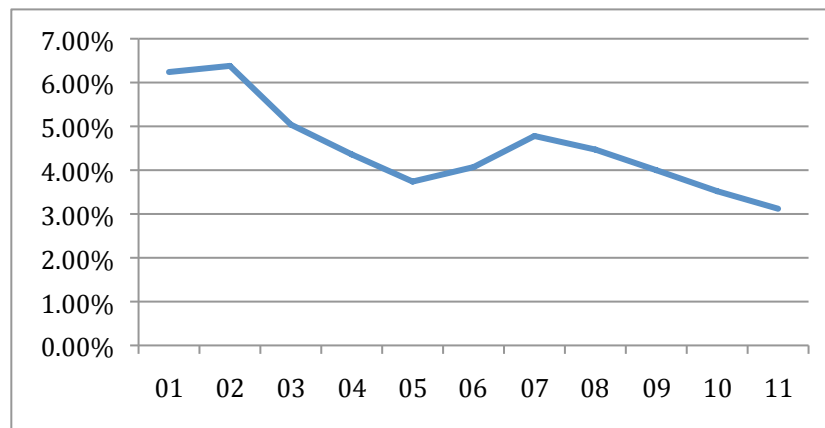
8.2 Driving factors behind pension premiums

An important aspect of the uncertainty under defined-benefit plans in the Norwegian Public Service Pension Fund is the time lag between the projections and the actual payments to the arrangement. The institution does not provide a

continuous invoicing according to changes in the market or demographics like the private suppliers do, but issue a budgetary proposal for the following year in June. Two years later, in June, the institution issues its account transcripts. These reveal whether the budgetary proposals were in excess, fell short or were on target. Discrepancies are then charged or credited the pension plan accordingly. This may appear as minor details, but if minor discrepancies are multiplied over a substantial volume of employees, or if the discrepancies themselves are large enough, they can have a definite impact on the uncertainties associated with the pension provision, and as

The Norwegian Public Service Pension Fund provides three input factors driving the annual results: Interest rate, risk pool and non-insurable elements. The mechanism behind the interest rate component is such that return to capital exceeding the defined base rate of 3 percent is transferred to the pension account. As mentioned previously, the institution is not funded, but organized as a PAYG-plan. Therefore the return to capital is based on fictitious funds instead of real capital in the plan. Interest rate affects both net contributions (paid premiums minus pension payments in a year), and return to capital, given the fact that they are both invested in 10-year government bonds. Re-investing the “funds” today yields a much lower interest rate on government bonds and therefore also a lower return to capital on the long term placements. Whilst investing in a 10-year bond in 2001 yielded on average 6,24 percent interest rate, a similar placement in 2011 yielded 3,12 percent return. Such a development implies that premiums would be adjusted upwards and the trend in recent years has been a negative one as we can see from illustration 4.

4. Interest rate, Norwegian 10-year government bond



(Norges Bank 2012a)

On April 16th, the frontrunners (frontfagoppgjøret) in the 2012 salary settlement agreed on what is likely to be a total wage increase of 4 percent. This implies an increased gap between Norway and its main trading partners (NTB 2012). It may also contribute positively to inflation, thereby increasing the interest rates. If this is to happen, then re-investing in 10-year bonds in January 2013 is likely to be at a more favorable interest rate than what was the case a year in advance. In the eyes of plan sponsors, this may have a welcome effect on premiums, but the fact remains that re-investments in 10-year bonds today will yield far less return than what has been the case for funds invested 4-5 years ago. The fictitious funds are invested in government bonds and a small fraction is “placed” with the Norwegian Government Pension Fund. The on-account (a-konto) calculations in the budgetary proposals are based on 1-year government bonds to more accurately capture the projections in the market compared to a 10-year bond.

The second element is the risk pool, mandatory for members of the Norwegian Public Service Pension Fund. This is a joint insurance element intended to support in case of mortality or disability. The groups of participants are assigned a risk weight, indicating a probability level of an individual group member dying or becoming disabled. Premiums are pooled and retrospective settlements are used to calculate the costs of events and whether paid premiums were adequate to finance actual withdrawals. If not, then an adjustment is needed from the plan sponsors. If paid premiums are in excess of the necessary allocations, the relative weight of excess premiums can be transferred back to the sponsor.

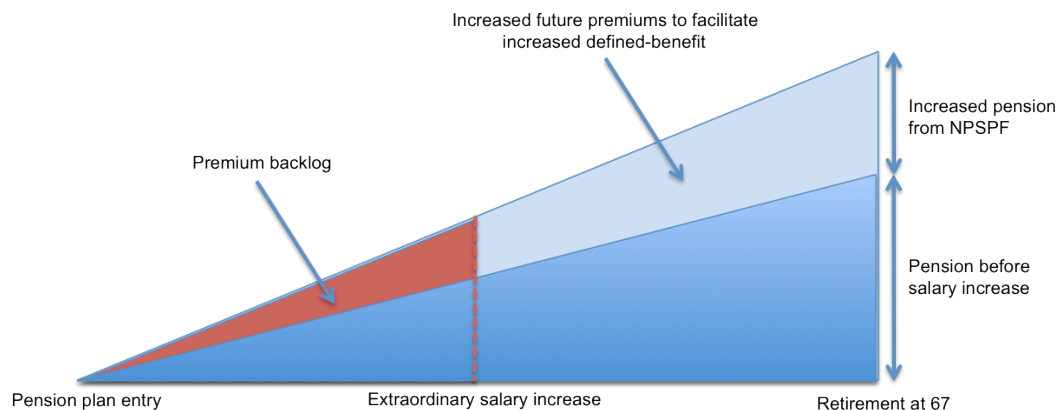
The third element is the non-insurable elements. This post includes factors that cannot be weighted and hedged through financial or actuarial mechanisms. It includes salary adjustments and unexpected changes to the base amount in the National Insurance Scheme beyond projected levels. These adjustments can be too higher or lower than the projections made in the calculations impacting the balance of the pension accumulation. The post also includes higher than expected volumes of early retirees through the AFP scheme, stretching the balance through company sponsorship of 2/3 of the associated costs. The discrepancies do not need to be large, as the thesis will display below, concerning an extraordinary salary adjustment in one single year.

8.3 Backlogs

In order to calculate premiums, the Norwegian Public Service Pension Fund needs to base the calculations on certain parameters. Expected salary increases and increases in the base amount as well as interest rates are put in a proposal to the Ministry of Finance for approval. The parameters are based upon projections and trajectories from Statistics Norway and certain automation is applied in the approval process. For all purposes, a one-year horizon is used. In the calculations in this thesis, an average of projections for 2012 through 2015 is used in an attempt to project a likely general trajectory. Needless to say a projection based on a three-year perspective may prove inadequate in a 30-year perspective, but it is not the purpose of the paper to accurately project parameter growth. As such, an average annual salary increase of 2.25 percent is the best parameter growth indicator available, and serves the purposes needed in the calculations.

Unforeseen movements in salary level, base amount level and excess participants taking on early retirement will affect the premiums charged on the plan sponsor. If the salary increases more than the projections, the premiums will need to be adjusted upwards to compensate for all previous allocations. This is shown in the schematic illustration 5 below.

 5. Salary trajectories and producing pension backlogs



As the figure shows, a salary increase at a certain point in time yields a new and higher trajectory for the defined-benefit at retirement. The increase also produces a backlog, the red area, for which a one-time payment is issued.

As the on-account calculations issued in the annual statement from the Norwegian Public Service Pension Fund are made based upon certain assumptions, discrepancies between these and actual events may disturb the calculations. This is true for adjustments in the base amount and for salary adjustments in particular. In many organizations, including the one in our illustration, extraordinary salary adjustments occur, either in the form of promotions or through other mechanisms. To illustrate the effects on the pension plan benefactor, the thesis has factored in an extraordinary salary increase of 10 percent in the 10th working year, or at age 37, and maintained the previous 2,25 percent annual increase all other years. All else are equal, both in terms of average employment fraction, accumulation under the National Insurance Scheme, etc.

The effects from this extraordinary salary increase are dramatic. First and foremost, the increase results in a salary adjustment for the male 37-year-old, in real terms, from NOK 560.000 to NOK 602.000 in the tenth working year. The end-point number (sluttpoengttall) also increases from 6,64 to 6,79. The constant 2,25 percent salary increase necessitates a pension provision by the Norwegian Public Service Pension Fund of 14,51 percent. The extraordinary salary increase in the tenth working year implies that the fraction of total pension provision allocated to the Norwegian Public Service Pension Fund increases to 17,31

percent. The total backlog, issued as a one-time payment, for the first 10 years of employment is then NOK 149.000 for this one individual. If the above event were to reproduce itself for more individuals with the same characteristics, then simple multiplication would naturally yield the total impact this single year. This illustration is perhaps a very stylized one, and the salary increase of 10 percent is specifically for illustrative reasons. However, as an individual from the academic cohort approaches retirement, the impact becomes increasingly large.

If the same percentage increase were to be applied to a 47-year-old male employee, the end-point numbers would be identical to that of the 37 year old, the pension provision by the Norwegian Public Service Pension Fund would be 27 percent and the backlog would be NOK 271.000 on a current salary of NOK 752.000. The reason the end-point numbers are identical for these two ideal type cohorts is the 1992 change in pension percentage from 45 percent to 42 percent. The 47-year-old accumulates 2 years under the previous regime, whilst the 37-year-old accumulates all years with a pension percentage of 42. This is not sufficient to affect the end-point calculation in any direction as the system is designed to avail of two decimals only. This difference however, is substantial if the 10 percent salary increase is applied to our 57-year-old male. The ideal type would then accumulate 12 years under the previous pension percentage regime, resulting in an increased end-point number from 6,79 to 6,90. His pension coverage from the Norwegian Public Service Pension Fund would be 34 percent and the backlog for one-time payment would be NOK 411.000. The progressive increases in the sizes is attributed to the increasing years in need of retrospective funding to meet the accumulated pension provision at time of retirement. Even though it in simplistic terms gets more and more expensive to employ tenure academic staff, the cost projections are not continuously progressing. The 12G cap in the National Insurance Scheme implies a limited increase in the end-point numbers and thereby curbs some of the premium increases, but not all of it. For the female academic staff, the effects are similar, but the 10 percent lower salary level implies less impact on premiums charged, in real terms. The table below summarizes the findings from the calculations.

For the female staff the effects are also substantial, although less so than for their male equivalents. The reason for this is the same logic elaborated upon above,

with lower salary levels yielding higher fraction covered under the National Insurance Scheme, thereby reducing the remaining fraction of the retirement income to be covered by the Norwegian Public Service Pension Fund in order to reach the defined benefit of 66 percent of final salary. A 10 percent salary increase for our 37-year-old results in an end-point-increase from 6,37 to 6,57. The nominal salary increase is from NOK 504.000 to NOK 542.000 and the backlog produced is NOK 129.000. The 47-year-old receiving the same 10 percent increase in salary experiences the same end-point levels due to the 1992 change addressed above. Through the Norwegian Public Service Pension Fund, the plan benefactor would have to accumulate 13 percent of NOK 677.000 instead of 10 percent of NOK 629.000 and the backlog in need of filling is NOK 231.000. For a 57-year-old, the end-point increases from 6,54 to 6,70, yielding an accumulation percentage of 31 up from 29, placed upon a salary level of NOK 846.000 up from NOK 786.000. This ideal type then creates a backlog of NOK 357.000 that is issued as a one-time payment from the Norwegian Public Service Pension Fund.

The above effects are of course based upon the fact that all other factors except salary are held constant. An increase in the base amount beyond what is expected in the on-account calculations will yield a higher fraction of the defined-benefit accounted for by the National Insurance Scheme, thereby leaving less to be accumulated through the occupational pension element of the pension mix. Consecutively, if the base amount is adjusted to a smaller amount than what is projected, pension provision through the National Insurance Scheme is consequently reduced and the premium increased in order to deliver on the 66 percent gross guarantee. If the number of employees retiring through AFP before reaching 66 turns out to be lower than projected, necessary premiums are lower and a return transfer is issued. If the number is higher, premiums are raised in order to meet future obligations.

8.4 Summarizing the arguments

As the calculations and subsequent analysis in this chapter has illustrated, a defined-benefit design with the Norwegian Public Service Pension Fund produces uncertainties affecting rationality in decision-making for the employing

organization. A defined-benefit pension design affects the employing organization by cancelling out the re-distributional effects included in the National Insurance Scheme. This is perhaps not optimal from a socio-economic standpoint, and certainly not optimal for the employer, since re-distributional effects paired with the gross guarantee implies greater costs and changes in projected salary and base amounts leaves uncertainty concerning the annual premiums. In addition, lower interest rates affect the return to capital in the fictitious public pension “fund”, and thereby increase premiums for the employers.

Also, divergence between expected trajectories and actual events produce backlogs in need of closing. Closing the gap between what has been accumulated and in retrospect what should have been accumulated is the responsibility of the employers, and massive one-time payments are issued. Calculations in this thesis have shown that large discrepancies for highly compensated employees result in massive backlogs that needs to be addressed. The following chapter will elaborate on the alternative to the defined-benefit plan, a pension plan offering alleviation to these uncertainties in long-term economic planning.

9 Disentangling the problem: Defined-contribution plans

As the defined-benefit plan produce uncertainties, these needs alleviation. Replacing the publicly provided defined-benefit pension plan with a defined-contribution pension design offers such alleviation. What takes place when transitioning to a defined-contribution plan is that the risk is completely transposed to the employees. Where their retirement income was previously defined, now it is instead dependent on return from investments in financial markets, interest rates as well as macroeconomic factors like inflation. In addition, the coordination principle at the base of a gross guarantee arrangement with the National Insurance Scheme is removed, leaving the two levels of the pension system independent of one another. This latter point has important implications. First of all, the re-distributive logic of the National Insurance Scheme is not compensated for. As the Norwegian Public Service Pension Fund is financed over the national budget, taxation effectively sponsors the provision and the re-distributive principles in the first pillar of the pension system are counteracted and more or less cancelled out. Following this, a second point is that salary increases do not have as much of an impact as the pension plan with the Norwegian Public Service Pension Fund. The upward income cap of 7.1G for vesting claims under the National Insurance Scheme implies that salary levels between this level and the upward cap of 12G in the occupational pension element needs to be additionally provided. This can of course be achieved through interest rate levels compensating for the backlog produced, but the by far most likely outcome is that the plan benefactor needs to cover the pension gap.

In a defined-contribution pension plan there is a certain flexibility concerning the time of retirement. The law opens for early retirement and thereby withdrawal of funds from the age of 62 (Lov 21. desember 2005 nr. 124 om obligatorisk tjenestepensjon 2005; Storebrand 2012b). The general rule is that a defined-contribution pension is to be supplied until 77 years of age, or for a minimum of 10 years (Storebrand 2012b). This represents a key difference compared to the defined-benefit arrangement used in this thesis. Private providers of defined-contribution occupational plans offer a so-called bundling of the accumulation vehicle, with a lifelong annuity commencing at the point of retirement. In order to produce a beneficial comparison with the defined-benefit plan, the analysis should

assume lifelong payments to the plan beneficiary, equal to the defined-benefit plan. For all purposes, the life expectancy at time of retirement used in the following calculations is 16,92 years.

9.1 Cost structures

The costs affiliated with the conversion to the aforementioned annuity are assumed carried by the plan benefactor, thereby not being deductible from the total vested funds at time of retirement. These costs are a one-time cost, carried in the year retirement commences. According to applicable law, administration costs and capital management fees are to be covered by the plan sponsor (Veland and Hippe 2008). However, if a plan beneficiary decides to change the investment portfolio outside the scope of what has been agreed between the financial institution and the plan benefactor, the individual is charged the management fee (Veland and Hippe 2008). The number of plan beneficiaries changing their allocation is low, and the volume changing outside the defined scope is even smaller. As the purpose of a thesis such as this must be to attempt to avail of assumptions as close to the reality as possible, the low volume of investment choice alterations results in this not being taken into consideration in calculations.

Legislation further stipulates that the plan benefactor needs to cover contribution exceptions (Innskuddsfritak) associated with disability and other risk covering arrangements (Storebrand 2012a). In addition a National Insurance Premium is also paid on all of the contributions made to the pension plan. For reasons of simplification, these costs are exempted from the calculations and subsequent analysis. As such, there are no costs for the plan beneficiaries. As this thesis is investigating the employer-side of the relationship, the calculations will assume that all costs connected to management and payment of the pension stock is carried by the employer. These costs are then annual administration costs and management fees, as well as the one-time cost of converting the accumulated pension stock into an annuity.

Concerning the administration fee in a defined-contribution pension plan, the thesis has calculated a weighted average from four of the largest institutions in the

market. The administration fee used in the calculations is therefore 0.5%. Likewise the management fee used is based on the same market actors and is weighted to 0.59% (DNB 2012; Storebrand 2012c; Gjensidige 2012; Nordea 2012). The fees vary significantly from one investment option to another, thus the thesis has used the sizes from the default options in the defined-contribution plans. Most often than not, this is an option with 50 percent allocation towards equities and 50 percent allocation to bonds or similar interest rate-based products.

Also worth a mentioning, is the competition in the market. As time lapses since the introduction of the reform on mandatory occupational pensions, more and more actors may find it in their interest to move into the product scope. Such increased competition may very well prove to drive the management fees and administration costs downwards. In addition to this, there is a large flexibility in service provision for tailoring of schemes, undoubtedly opening up for adapted fee structures. Such a bargaining position may also very well drive the cost components downwards. Employing organizations partaking in consortiums for joint procurement of pension plans have proven to obtain much more beneficial terms on cost and fee structures than stand-alone employers negotiating their own terms and conditions (Hippe 2009). When consulting the industry, the costs of converting the defined-contribution into an annual payment depend on a number of factors. This implies that the costs need to be assumed. For the matter of this thesis, we assume the costs of converting pension stock from the defined-contributions made over the employment period into an annuity to be a one-time cost of NOK 15.000. This is not an important aspect to include, since it is of little perceived importance concerning an accumulation taking place over an entire work life.

Available reports suggest that around 70 percent of plans and active members of a defined-contribution scheme accumulate the minimum annual contribution rate of 2 percent (Veland 2010). The following section will elaborate on the calculations made with this defined-contribution level, as well as the so-called 2/4 design and the maximum contribution rate. It will demonstrate that both the contribution rates, but not least differences in return to capital, produce vast differences in pension stock and subsequent annual pension payments. For reasons of simplification the different levels of return to capital is averaged over the

accumulation period, thereby producing a single return, or interest rate, throughout the employment period.

9.2 Minimum, 2-4 and maximum contribution rates

Identical to the defined-benefit calculations, the same salary level and salary trajectory of annual increases of 2.25 percent is used. In addition, an annual return on investment is factored in. As mentioned in Chapter 6.1.1, according to applicable legislation, the range of contribution spans from 1G up until 12G. This implies that a salary level below 1G does not accumulate pension stock. Similarly, a salary exceeding 12G is not tax deductible, although contributions can be made. In all the calculations, we assume an accumulation period of 40 years. If we assume a contribution rate of 2 percent and a return to capital of 3 percent, we find that the total pension stock of a male employee amounts to NOK 1.000.000. As mentioned previously, we assume lifelong annuity that results in an annual retirement income from occupational pension of NOK 59.000. For the female employees, identical assumptions yield a total pension stock of NOK 908.000 and an annual payment of NOK 53.000. If the interest rate is increased to 4 percent, the minimum contribution level produces a pension stock for the male employees of NOK 1.228.000 and for the females a total stock of NOK 1.114.000. This results in annual payments of NOK 72.000 and NOK 65.000 respectively. For the female staff, this one percent increase in return to capital then yields a monthly increase in income of NOK 1000 before taxes. If we further increase the return to capital to 5 percent over the period, the male employees will see their total pension stock amounting to NOK 1.524.000 and annual income from the pension equaling NOK 90.000. The female staff will accumulate total funds of NOK 1.380.000 and annual payments of NOK 81.000 under the same assumptions.

If we assume that the defined-contribution rate is increased in one step according to salary, we produce a different image. We now assume that the contribution rate commences at 2 percent, but increases to 4 percent in the year the salary exceeds 6G. Maintaining the interest rate at 3 percent, the male employees almost double their total pension stock at retirement to NOK 1.942.000. The annual retirement income from the occupational pension in this case amounts to NOK 114.000.

Their female peers also increase their annual income drastically, to NOK 96.000 form a total pension stock of NOK 1.638.000. If we apply the same increases in return to capital as with the minimum contribution rate, we see that a 4 percent return provides a total pension stock of NOK 2.373.000 and annual payments of NOK 140.000 for male employees. For their female colleagues, the annual payments become NOK 116.000 from a total stock of NOK 1.975.000. Again, increasing the return to capital another percent yields significant increases in accumulated funds and annual payments. Under these assumptions, male employees now receive annual payments of NOK 173.000 from a pension stock of NOK 2.926.000 and the female staff receives NOK 142.000 annually from a total stock of NOK 2.403.000.

The maximum (tax incentivized) contribution rates is defined by law to be 5 percent between 1G and 6G, and 8 percent between 6G and 12G. Holding the return to capital at 3 percent, a male employee in our illustrative organization accumulates a total pension stock of NOK 3.913.000 yielding annual payments of NOK 231.000. A female employee under this scenario accumulates a total of NOK 3.366.000 producing annual payments of NOK 199.000. Similar to under the other defined-contribution rates, we now increase the return to capital to 4 percent. Male employees now accumulate a total pension stock of NOK 4.788.000 and an annual income from the occupational pension of NOK 283.000. The female staff receives annual payments of NOK 241.000 form a total stock of NOK 4.077.000. A return to capital of 5 percent results in annual payments of NOK 349.000 for males and NOK 294.000 for females from total accumulated pension stocks of NOK 5.914.000 and NOK 4.985.000 respectively.

In the next chapter, the thesis will return to a central point in the thesis: If defined-contribution pensions are so much better, why not just transfer the employees to such a plan? It is worth noting that any subsequent comparisons between the two pension system designs will be based on the occupational component only, and not the total retirement income. The reason for this is that the defined-benefit plan includes the gross guarantee, whilst the defined-contribution plan does not. For this reason a direct comparison of the occupational element best serves the purposes of comparing design features and outcomes directly.

10 Transitioning problem(s)

10.1 Trade-offs

To claim that defined-contribution pension plans are superior to defined-benefit plans, or vice versa, is an argument that does not necessarily hold its ground. To that, the factors feeding into the calculations are too many, too uncertain and the reference group must be determined. In a discussion over pensions and the likely adversarial views upon it, one main question thus becomes vital: “What is a good pension arrangement?” Most likely, sponsors and recipients of pension income will have a different view on what determines a “good” pension scheme. These views can be summarized in the divide over defined-benefit versus defined-contribution.

For the employing organization, the arguments put forward previously in this thesis favor a defined-contribution design. The reason for this is that it removes the impact of macroeconomic events on government bond interest rates, socio-economically motivated adjustments to the base amount in the National Insurance Scheme as well as salary adjustments who sometimes can be argued to be as politically motivated as they are founded on economic rationale. By shifting from a defined-benefit design, these uncertainties are removed and replaced by other risks, now the sole responsibility of the employees. Instead of inflation driving up the interest rates positively affecting accumulation under a defined-benefit pension scheme, the same inflation may erode already accumulated funds under a defined-contribution scheme. This brief introduction concludes central previously mentioned arguments, that there exists a trade-off for the employer in choosing a pension design, or changing away from a design already in place. The following section addresses these trade-offs.

10.1.1 The employers

The undisputable trade-offs for employing organizations in the question of pension design is not disputed, nor controversial and in fact not even an interesting question. The important question is over how much of what is being traded off for what? If an employer can shift the uncertainties over on the employees without consequences, they would naturally do so without hesitation.

However, as pointed out previously, the organization in this thesis competes in a marketplace for academic staff. As the competitors offer membership in the gross guarantee defined-benefit plan with Norwegian Public Service Pension Fund as their sole pension design, our organization needs to be competitive.

If we imagine a similar development to what has been the case in Denmark, we can expect a change in perception concerning pensions. There, contributions towards a retirement income are seen in conjunction with economic factors of today. This means that employees factor in a present value of future pension provision in their perception of salary (Hippe et al. 2005). Even without such a convergence on the Danish perception, Norwegian employees could very well be rational enough to view future pension provision as a parameter of competition. With a move in the direction the Danish market has taken, such a development is evident. Following this line of reasoning, the employing organizations' trade off between the risks of defined-benefit and the certainties of defined-contribution becomes one of how much the organization needs to allocate to the pension stock each year. In simple terms; what percentage of salary must the employers contribute annually in order to match the annual retirement income from a gross guarantee defined-benefit regime?

Given a life expectancy of 16,25 years at time of retirement, the calculations producing the arguments in Chapter 8 imply that our defined-benefit regime demands a total "pension fund" of NOK 4.715.000 for male employees and 3.885.000 for females. In the minds of the employees, knowing what they get as retirement income must be regarded as a competitive advantage for the defined-benefit design. The annual income must thus be matched by a defined-contribution to "remove the competitive advantage". This produces the question of how much the employer needs to contribute annually towards the pension plan in order to produce identical payments, a question answered by the equation on present value outlined below:

$$x = \frac{S}{W_0 \sum_{i=0}^n (1+g)^i (1+r)^{n-i}}$$

where:

- x = Annual contribution rate
- S = Pension stock at retirement
- W_0 = Annual income in year 0
- g = Salary increase
- r = Return to capital
- n = Years of accumulation
- i = A particular year

In the equation, the only unknown parameter is the contribution rate, and all other input factors are assumed. As in Chapter 9, the calculations will use return to capital rates of 3, 4 and 5 percent. Also, the same sizes are used concerning starting salary and salary increases. In addition, it will provide the necessary contribution rate under a worst-case scenario of zero return over the 40-year accumulation period. For male employees, an average return to capital of 3 percent yields an average annual contribution rate of 8,87 percent, whilst the same scenario for a female employee implies a contribution rate of 8,12 percent. Increasing the return to capital to an average of 4 percent yields contribution rates of 8,69 percent for males and 7,96 for females. A further one-percentage point increase in the return implies that the contribution rate for males is reduced to 6,97 and 6,38 for females. Following the framework for contributions laid down in both Chapter 6.1.1, we can see that return to capital levels of 3 and 4 percent for males and 3 percent for females produce contribution rates that are not tax incentivized. Without going into details on the exact consequences of this, certain net effects must thus be expected.

If we take a look at the worst-case scenario of a zero percent average return to capital, the contribution necessary to produce the same annual retirement income as the defined-benefit design is 15,53 percent for males and 14,22 percent for females. This lays further outside the tax incentivized upper bound of 8 percent

and would thus produce even larger net effects than returns to capital of for instance 3 and 4 percent. As mentioned in Chapter 9.1 on cost structures, the plan benefactor is to account for administration costs and management fees charged on defined-contribution pensions. The illustration below summarizes the calculations presented above and displays the annual costs for the employer of providing its employees with a defined-contribution pension plan, with and without the costs levied by the service provider:

6. Average annual costs to plan sponsors of defined-contribution plans, measured as percentage of annual salary

	Male		Female	
	w/o additional costs	w/ additional costs	w/o additional costs	w/ additional costs
0 % ROI	15.53 %	16.62 %	14.22 %	15.31 %
3 % ROI	8.86 %	9.95 %	8.12 %	9.21 %
4 % ROI	8.69 %	9.78 %	7.96 %	9.05 %
5 % ROI	6.97 %	8.06 %	6.38 %	7.47 %

ROI: Return on investment

w/: With

w/o: Without

This discussion has concluded that given certain average returns to capital, a certain average inflation adjusted annual salary increase and given salary levels, a certain average percentage to accumulate annually is produced. This percentage would be a concrete decision-making parameter for our illustrational organization. As we can see from illustration 6, there are uncertainties connected to the return to capital scenarios the thesis has based its calculations upon. If we now turn to the employees in the organization, they are likely to be concerned with the discrepancies based upon return to capital. We can then turn the aforementioned section on its head and look at what is a good pension plan for the employees.

10.1.2 The employees

It is easy to jump to the conclusion that a defined-benefit pension plan is by far the most beneficial for the employees. The calculations in the previous section have proven that this is not necessarily the case. Given an average return to capital

over the accumulation period of 7 percent, a savings rate of 9 percent would result in an annual retirement income exceeding the income under a defined-benefit regime as discussed in a previous chapter. Even with a perfect match between returns to capital and contribution rates, there is another element worth dwelling by. This is in essence a question of dependence. Whilst the employing organization indirectly provides the individuals with an income post retirement, they are directly linked to the income in the working years leading up to retirement. As such, it is in the employees' best interest that an employer operating in a competitive market is indeed a competitive actor. Uncertainties in long-term planning may hamper progression and diminish a beneficial environment for innovation.

When operating in a market for students as well as for employees, competitiveness may suffer, as the academic quality would eventually recede. Reduced competitiveness may in turn lead to lower volumes of students admitted, thus negatively influencing income levels. Increasing tuition fees could of course counteract such events, but we must assume that the demand is sensitive to price, at least at a given threshold, and therefore this is not a viable repetitive option in the long term. A good pension design for employees may therefore just as well be a defined-contribution plan where the annual contributions are sufficiently high, whilst at the same time the employing organization enjoys full information concerning their annual financial responsibilities concerning retirement income. Likewise, we can see that there are benefits of both models, dependent for instance on the assumptions at the basis of the calculations. A following section will elaborate on merging different benefits in what is themed as *hybrid pension design*, after the thesis has addressed challenges in making a shift from a defined-benefit to a defined-contribution design.

10.2 Making the shift

There are several ways in which a change from one pension plan with a defined-benefit design into another with a defined-contribution design can take place. One way is to allow for a gliding transitioning, where existing plans are maintained, whilst all new employees are included in the defined-contribution arrangement.

This allows for a natural crowding out of an existing pension design, but at the same time it has certain drawbacks. An obvious one is that it is slow. Assuming a 40-year accumulation period, one can conceive of 39 years passing before the defined-benefit design is in effect replaced. The second is a possible reduced cohesion amongst employees. Changes in the parameters feeding into the calculations on future retirement income affect the two designs in different ways. If two groups in the same organization are affected in different ways, they will both claim the right to sufficient compensation. If the defined-contribution rates are lower than what is expected to produce an identical lifelong annuity at retirement, salary increases for this one group may be required and demanded. Thereby, you risk producing two different salary trajectories for employees in the same organization and most likely also members of the same trade union. The employers can couple the closing of new entries into the defined-benefit regime with a voluntary shift for employees already included in such a design. Such a transition mechanisms would likely produce a divide between generations, or groups of cohorts, as employees closer to retirement would most likely prefer a continuation of the defined-benefit regime, whilst younger staff could very well prefer the defined-contribution alternative. If the incentives for changing are thoroughly devised and effectuated, then such a system could very well be a good common ground for employers and employees alike. It is important to note that with voluntary change, the employees need to perceive the pension stock at retirement as sufficient. This, as their option is a lifelong annuity of a pre-defined size. A third option is to close the defined-benefit plans, and move all employees into a defined-contribution design. Here, the accumulated rights to a defined-benefit would have to be calculated into a first-time deposit in a defined-contribution plan. The main challenge here is that

10.3 The hybrids: Pension products of the future?

The Norwegian market for occupational pensions and associated financial products is rather young, and with large potential for innovation and development going forward. This may well open up for an internationalization of the Norwegian product scope compared to the situation of today. In their report of 2008, the Bank Law Commission opens up for additional pension plan designs,

aimed at bridging some of the gaps between the two designs and possibly improving the situation for all participants (Hippe 2009). The recent publication from the same Commission has panned out the recommended direction in which this bridging should happen. Implications from the new proposed scope are that the capital requirements for life insurance companies are reduced, and tailoring of the products is possible to satisfy a larger spectrum of interests (Banklovkommisjonen 2012). These may be the needs of the employers, or those of the employees. Nevertheless, such inputs are potential game-changers, as more emphasis on a widened product spectrum brings more possibilities to choose from.

We can imagine that a pension plan with the cost regularity of the defined-contribution plan coupled with the employers guaranteeing a pension level, thereby maintaining the risks instead of shifting it to the employees, is a best-case world. This would perhaps also in turn be the best solution for both plan benefactors and plan beneficiaries. Is such a reality feasible? What kind of design would then be needed? The designs that “steal with pride” from the stylized pension plan designs are referred to as hybrid designs. They are essentially one design induced with some, or many, of the characteristics of the other design (McGill et al. 2005). These hybrid plans can take on many characteristics, and this thesis will restrict itself to mentioning two existing designs available for occupational pensions. It is important to notice that these hybrid designs are taken from the US occupational pension market, a market at the vanguard of private pension arrangements for decades. As such, underlying incentives may not coincide with the systemic and taxation mechanisms in Norway, or the Norwegian system may not have matured to the stages of its American equal. For such reasons, the designs below should be viewed as conceptual frameworks that could be adapted to the Norwegian tax regime, pension system and other influencing elements.

10.3.1 Cash Balance Plans

Cash balance plans are examples of hybrid solutions to the division of risk connected to retirement income. In essence it is a defined-benefit plan, in that it promises a certain size at the end of the accumulation period (McGill et al. 2005).

Unlike the traditional defined-benefit plans, however, it does not promise a certain annuity paid throughout the retirement period. Instead, it promises a lump sum accumulated at the end of the period, that in turn will be paid out like a defined-contribution account balance would be. The accumulation happens through a defined allocation fraction, a pay credit often represented as a percentage of annual salary and an interest rate component. This pay credit may increase with tenure, as a manner of rewarding loyalty to the company, or it may remain stable throughout the accumulation period. The interest credit component can be a fixed interest rate percentage or it can be connected to an index like 1-year Government bonds or another market standard. The interest credit is not a return to capital, but an indexation tool. This implies that it is not directly connected to the accumulated claims and as such the risk is placed with the employer, not the employee (McGill et al. 2005, 311).

The cash balance plan gives the employing organization the predictability in accumulation as is would experience under the pure defined-contribution design. The common formula for accumulating retirement income under a cash benefit plan is the beginning-of-year (BOY) account balance at time t_0 , plus the annual pay credit taking the form of the fixed percentage contributed and the interest credit accrued over the year. This yields an end-of-year (EOY) account balance, which is in turn the BOY account balance in year t_1 . This formula is then reproduced until $t_{\text{retirement}}$ (McGill et al. 2005, 310-311). Whilst the employer bears the risk of increases in salary levels and interest rate returns below the benchmark, the employee bears the risk of the annual payments being lower than under a defined-benefit plan given higher life expectancies. In short then, under cash balance plans, pension is accumulated annually. As we will see, this is a different logic than the second hybrid option.

10.3.2 Pension Equity Plans

Similar to cash balance plans, pension equity plans are in essence defined-benefit plans with characteristics form defined-contribution schemes. It is similar to the cash balance plan in that it aims for a defined account balance at the point of retirement instead of an annuity for life. What is the main difference however,

stems from a certain disproportionate accumulation for individuals entering and producing a higher salary trajectory for themselves than others.

The pension equity plan accumulates funds through a certain percentage of final average pay into a lump sum benefit received at retirement. Similar to the cash balance plan, a percentage of the at all times final average salary is cumulatively allocated to the account balance. Unlike the cash balance plans, there are no interest components added to the pension accumulation. This is due to the fact that the indexation takes place through increases in final average salary, whilst the cash balance plan is indexed through interest rates. This difference implies that the higher rewarded employees achieve a higher level of lump sum accumulation at time of retirement (McGill et al. 2005, 316). Contrary then to the cash balance plan, the pension equity plans annually accumulate a *percentage* that is in turn applied to a final salary.

11 Conclusions

11.1 A general summary

When discussing the best pension option possible for the two parties, it is easy to conclude that for the employers a defined-contribution pension plan is the best. It is the best because of its superiority concerning stable and predictable payments to a savings arrangement and shifts the risk entirely over on the employees. As such, one could argue that for the employees the situation is the direct opposite: Defined-benefit plans are superior in that they guarantee a certain fraction of final year's salary as an annual retirement income. Through a defined-benefit pension plan, the risk is shifted onto the employers, but it is worthwhile to provide certain arguments providing a more nuanced picture.

This thesis has attempted to illuminate the question of how employing organizations are affected by the design of their employees' pension plan, and how this can affect their rationality in long-term financial planning. What it has shown is that the defined-benefit design inherits certain characteristics that produce uncertainties. Macro-economic developments and longevity risks imply that the employer needs to funnel more and more funds into the schemes, funds that are outside the predicted costs based on the service provider's calculations. This proves the point that defined-benefit pensions are the "problem", to which there is a solution; a defined-contribution design.

With full information on current and future allocations, long-term planning is facilitated in a much more transparent manner, leaving the employing organization better off. In addition, the employees also benefit from a stable employer, indicating that a defined-contribution design is beneficial for them as well. Whether it is beneficial for them is anchored in the employees' question over "what will I receive in retirement income?" The answer stems from a simple trade-off on the behalf of the plan sponsor. The calculations produced in this thesis imply that the same annual retirement income can be produced without excessively large annual contributions. Given a positive return to capital over the accumulation period, this thesis will conclude that the rationality gained is worth generous contributions. This spurs a new theme – issues of transition. How are

the employees to be transferred from one scheme, which they may prefer, into another? Several options present themselves, again with different sound to them according to which side of the table one sits at. For the employers, it appears that the best solution is to combine coercion with incentives. Mandatory closure of all defined-benefit plans, re-calculation of accumulated claims into an initial deposit and contribution rates expecting low returns to capital. Thus, excess returns are made more likely and the lifelong annuity more larger.

In most employment relationships there exist a dependency and most often it is asymmetric in that employees depend on employers for income. As such, one can argue, “what is good for business is good for the employees”. This may especially be the case when the competition for high-quality staff is made where all actors in the market provide the same solutions. Stable and certain costs in turn then offer the employees a certain income in their working years and then a defined-contribution pension plan is the prevailing option. It is not the intention of this thesis to conclude on such a question, but certainly suggest that it is of high interest for research going forwards.

Trade unions in Norway are frequently arguing the superiority of defined-benefit plans. Perhaps they are indeed not superior, since retirement income depends on a number of variables. The answer is then one I, as a novice in the field, frequently provide when asked to comment on which pension plan design is the best: “It depends”. It certainly depends, given the recommendations recently presented by the Banking Law Commission. This potential widening of the product scope may prove very beneficial in the Norwegian pension market, and provide more tailoring to needs than the market allows for at the moment.

11.2 Future research

In working with the thesis, several interesting questions have been produced. Given the scope of a master’s thesis, they cannot be pursued to the extent that interesting discussions are produced. A highly relevant question for the future is whether opening up for hybrid designs, as suggested by the Banking Law Commission, are likely to coexist alongside the two existent alternatives, or

whether it is likely to crowd out defined-benefit plans. This latter has been the prevailing view amongst experts portrayed in the media since the release of the report from the Commission. The analysis in this thesis suggests that there is no universal answer to questions of best practice in pension system design. It depends. As such, what factors could be likely to be the determining ones in the predicted crowding out? In a similar vein, assuming that product innovation will manifest itself in the private sector first, what will happen to the Norwegian Public Service Pension Fund? It is organized as a pure defined-benefit provider and preserving such a product scope may create new, or further divides between individuals employed in public and private sectors. This would arguably be counteracting the underlying logics behind the reform on occupational pensions from 2005.

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Preliminary Thesis Report

Occupational pensions and their implications for rational decision- making:

– A case study of the Norwegian Business School –

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Summary

Pension is a central aspect of a modern welfare state and affects individuals and organizations both at the microeconomic and aggregate levels. The Norwegian pension regime is a complex one, but in essence it comprises of a nationally supplied, an employer supplied and a personal savings component. This preliminary thesis report outlines the central aspects of my coming thesis, whose objective is to investigate the employer supplied element of the pension mix. It will use the Norwegian Business School as a case study and analyze how and to what extent a defined benefit retirement plan affects the rationality of the plan sponsor in its long term economic planning. More specifically, the thesis will seek to answer the question *“how is the Norwegian Business School affected by pension system design and how does the co-existence of current retirement schemes affect the organization’s rationality in long-term economic planning?”* In its analysis, the thesis will use ideal type individuals seeking to display different effects from exogenous factors on the decision-making rationality of the organization.

This proposal provides the reader with a preliminary plan for the intended progression in working with the thesis theme and problem definition, as well as some initial thoughts on possible interesting discussions raised through investigating a co-existence of pension schemes as the one present at the Norwegian Business School.

Introduction to the thesis' topic

Income after retirement from the workforce, or pension, is an important pillar in a modern welfare state. It's main objective is to secure an income after exiting the working force and thereby bridging the income gap produced by losing income from paid work. In Norway, pensions are embedded in a system often presented as a pyramid consisting of three levels (Norwegian Public Service Pension Fund 2012; The Ministry of Labor 2011). The first of the three is a public retirement pension provided for by the state (Folketrygden), the second level – occupational pensions, are connected to an employer-employee relationship and the top level concerns the individuals' personal savings for retirement. The pyramid can also be perceived to consist of a macro level (that of the state) and a micro-level (that of the employing organizations and the individuals). Pension is a complex topic and one that affects all members of society, whether they be included or, for some reason or the other, excluded from the workforce. Ever since the National Insurance Scheme was introduced in 1967, the Norwegian landscape for pensions has been in more or less continuous evolution (Dølvik et al. 2007), adding to the complications surrounding themes on pensions in Norway. Pensions provision in Norway is highly regulated by law. Even so, it affects organizations and individuals differently according to their employed sector, tenure, age and profession. This thesis proposal will touch upon some specifics on pension legislation, obligations, rights and requirement, but the main thrust on these elements will be provided in the final thesis.

All three levels of the pension pyramid can be operationalized and analyzed through a number of interesting problem definitions. Extensive work has been done both on analyzing the system, its possible adverse effects and implications for Norwegian individuals. Much work has also been performed on the impact of the public retirement pension system in later years, especially since the passing of the legislation on new retirement pension in 2009 coming into effect January 1st 2011. Analyzing the Norwegian pension system is a daunting task for anyone, particularly daunting perhaps, for a student enrolled in a Master of Science program. In order to produce a relevant thesis and interesting and well-founded discussions and conclusions, the scope needs to be reduced dramatically. For that very reason, this coming thesis will occupy itself with the second level of the so-

called pyramid, and it will use a case study to investigate a current occupational pension regime, and its effects for the employing organization. It will look at the Norwegian Business School and investigate the implications of a defined benefit pension plan from two separate service providers, one public and one private actor. The purpose of the thesis is to investigate the impact on this co-existent pension regime on rationality in long-term financial planning and decision-making for the organization. In doing so, a thorough description of the pension regime at the Norwegian Business School is needed and the following section will provide a brief introduction to this, whilst the final thesis will allocate substantial time and provide extensive details on this element, as it will be crucial for the final product.

Even though the focus of this thesis will be the impact from different retirement schemes on the rationality of the organization, it will be hard to completely disregard impact on the individuals employed at the Norwegian Business School. Even though they are all provided a defined at 66 percent post-retirement, elaboration on the interplay with the public retirement pension system (level one of the pension pyramid) is deemed necessary in order to further foster a beneficial discussion. If there are indeed discrepancies between public and private provision concerning the interplay with the national retirement pension, these may prove interesting in a discussion on whether the Norwegian Business School could and should transfer all employees to a privately supplied retirement plan or indeed if a transition to a defined contributions scheme should be undertaken. This latter arguably increases the certainty in decision-making and costs for the Norwegian Business School, but may prove hard to implement when the organization competes with other publicly funded and run learning institutions over academic employees.

The importance of pensions

Pensions as a concept are arguably one of the most central service provisions in a modern welfare state. Consumption smoothing when exiting the workforce is key in order to secure a worthy retirement and maintain living standards according to previous years. The debate on all levels of the pension pyramid rages in the media

and remains a hot topic in political debates as well as vital to most members of society. The motivation for choosing this topic is the fact that pensions are a central topic in political economy, its position at the centre of the welfare state and its importance to participants in the workforce allowing them to secure a good income in their late years. Through past experience I have been able to work on pension related themes both through academic work during my studies and also engagement at Storebrand Life Insurance.

The case: The Norwegian Business School

The purpose of this paper is to investigate the occupational pension regime at the Norwegian Business School, its effects for the employees and the plan sponsor (the employing organization). The case is of interest for several reasons. The first reason I would like to highlight is the presence of two groups of employees. The working staff is separated into two groups, academic staff and administrative personnel. These two groups are included in different pension schemes, presenting different effects for the Norwegian Business School as the plan sponsor in all cases. The academic staff is included in a defined benefit pension scheme with a public service provider; the Norwegian Public Service Pension Fund, while the administrative staff is included in a defined benefit scheme with a private provider; Storebrand Life Insurance. These two service providers display different behavior with respect to factor adjustments in building the defined benefit pension, and this is a point that will be central to the thesis.

The second reason is the fact that the Norwegian Business School is a private learning institution organized as a foundation, thereby excluding the same profit motives witnessed in organizations in the private sector generally. The competition landscape is also different, adding to the interest of the organization as a case. As a university institution, it competes for academic labor with publicly funded and run institutions where the Norwegian Public Service Pension Fund reigns supreme in provision of pensions. Even if the retirement income of 66 percent of “final” annual salary (*final* is placed in quotation marks as salary in the final employed year are adjusted for downwards sloping income trends in the final working years), there are other benefits connected to membership in the

Norwegian Public Service Pension Fund, for instance a low interest rate on housing mortgages. Much time will not be devoted to this latter point in the final thesis, but it is still worth mentioning. A main point concerning the pension system design and its impact on the Norwegian Business School is that when life expectancy adjustments go up and interest rates go down, the costs of funding a defined benefit retirement scheme goes up. This is just the development that has been witnessed in Norway the past years. This undermines the incentives for long term financial planning. This will be a key element of my thesis, as it is arguably the foundation for the problem definition and the reason for choosing the Norwegian Business School as a case.

The context of occupational pensions in Norway

The market based occupational pension schemes in Norway have grown rapidly and become one of the most decentralized and individualized in Europe the past 25 years (Dølvik et al. 2007). Occupational pensions in Norway have experienced a surge in quantity the past years, much due to the passing of the Law on Mandatory Occupational Pensions (Lov om Obligatorisk Tjenestepensjon, OTP) in 2005. Since the passing of this legislation, occupational pension schemes have really grown in magnitude and size, and it appears that defined contribution plans are in the process of crowding out the defined benefit arrangements that have made up the bulk of occupational pensions even after the passing of legislation on defined contribution retirement plans (Lov om Innskuddspensjon, LOI) in 2001 (Hippe et al. 2005).

The legislation on mandatory occupational pensions states that an employing organization with minimum two employees with working hours constituting more than 75 per cent of a full time employment and where the minimum employment is two 100 per cent positions and employees hold a minimum of 20 per cent positions (Lov om obligatorisk tjenestepensjon 2006). In light of life expectancies affecting the public retirement pension, this legislation was set in place to make sure post-retirement income will be satisfactory in the future through forcing the employers to partake in the funding of pensions. The law makes sure that everyone entitled to a pension gets it, as long as they fulfill certain set definitions.

What kind of retirement scheme the employees are enrolled in is determined and financed by the employer (Halvorsen and Stjernø 2008), and is in turn regulated by separate laws. The law on occupational pensions covers defined benefit schemes as well as defined contribution schemes with insurance elements (Lov om foretakspensjon 2001), while the law on defined contribution pensions covers this type of retirement plan (Lov om innskuddspensjon i arbeidsforhold 2001). With respect to defined benefit schemes, pensions provided by the Norwegian Public Service Pension Fund are further regulated (Lov om Statens pensjonskasse 1949). As the Norwegian Business School operates with defined benefit schemes only, the covering legislation will have to be panned out in the final thesis, but for this proposal it suffices to mention it only briefly.

Legislation covering defined contribution schemes will also be included in the final thesis, due to the fact that the management at the Norwegian Business School has expressed a desire to transfer to such a retirement plan, at least with respect to its administrative staff. This will follow from the discussion section of the final thesis and perhaps, and hopefully, also manifest itself through interviews with the accounting and finance department at the Norwegian Business School. The latest major reform on pensions in Norway was passing the legislation on mandatory occupational pensions in 2005. This reform is interesting in conjunction with the prior major reform, the law on defined contributions pensions from 2001. Ever since 2001, there has been an increase in defined contribution retirement schemes, but as mentioned earlier, the major upswing for defined contribution came with the mandatory occupational pension from 2005. The reasons for the increase in defined contribution plans at the expense of its defined benefits counterpart will be elaborated upon later in this proposal, and also in the chapter of the final thesis covering pensions in Norway in general.

Several institutions, including the Norwegian Business School, have a pension regime that can be labeled as co-existing. Other institutions have a co-existence of defined benefit and defined contributions. This can especially be the case for organizations with a fairly large age spread in its working force. Co-existence may well prove to be a source of conflict between the employers and the employees, but also amongst employees. This point does perhaps not lie at the core of the research question, but in order to produce an interesting and fruitful discussion

tensions at the individual level also needs to be addressed. Occupational pension systems in Norway can take on the form of defined benefit or defined contribution, and the difference between the two forms can be perceived in terms of risk. Risk, both with respect to the plan beneficiary (the employee) and the plan benefactor or plan sponsor (the employer). With a defined contributions scheme, the uncertainty for the plan sponsor disappears. An agreed-upon percentage of the employees' annual salary is placed into pension account and accumulates through additional contributions and returns on investment. The uncertainty for the employer is thereby heavily reduced. This risk can be perceived to be transposed to the employees. Their income after retirement is heavily influenced by returns to investments and thereby volatility of different investment vehicles. With defined benefit schemes, however, the situation is turned around. With such pension plans, the employees are provided a certain percentage of their salary level at exit from the workforce as an annual pension income. The employees know what they can expect to receive as occupational pension, regardless of the development in international markets for investment products. The uncertainty, and thereby risk, connected to retirement savings is thereby transferred to the plan sponsor (Barr 2004).

The defined benefit for the employees is sometimes to be provided for a certain time period, or as in the case at the Norwegian Business School, for life. This is a good time to introduce a crucial point with respect to pensions: We do not know for how long we are going to live. Adding to this, the life length expectations in Norway show a consistent trend in that we tend to live longer than previous generations. Life expectations affect the pension allocations from the Norwegian Business School in that the organization has to provide for its employees for longer periods after their retirement. This indicates that the contributions per employee increases and costs for the organization goes up. As both academic and administrative staff at the Norwegian Business School is included in defined benefit schemes, life expectancy adjustments affect costs through both academic and administrative staffing alike. The sponsoring organization, the Norwegian Business School, has to bear the costs of a professor being expected to live an additional year through funding one more year of his/her retirement income. This becomes interesting in light of an increase in life expectancy over the past 25 years of six years for men and three years for women (Statistics Norway 2011). A

proven challenge connected to this manifests itself through the nature of the service provider. Storebrand Life Insurance, as a private actor, has shown, reported and claimed increased premiums through rapid adjustments and as such provided a more steady distribution of costs to the plan sponsor. The Norwegian Public Service Pension Fund on the other hand has not displayed the same agility in adjustment and provides a challenge through higher “lump sum” demands. Needless to say, an additional pension cost of NOK 20 million for a hypothetical plan sponsor provides challenges if the same plan sponsor runs its operations with a NOK 25 million surplus intended to fund further research.

Input from theory

Rational choice is a much-used input for modeling decision-making in political economy, microeconomics and macroeconomics. In its simplest form, the model is based upon a number of assumptions, including a well-behaved utility function, rational behavior on the account of the individuals and organizations involved, absenteeism of uncertainty and competitive markets in supply and demand. As made evident, this paper will elaborate on pension in general and more specific, on the pension regime within a chosen case: The Norwegian Business School. When discussing old age pensions, the assumption of certainty becomes one open for scrutiny. In a world with perfect certainty about the future, insurance becomes unnecessary and participants in the workforce provide for their own retirement through voluntary savings (Barr 2004). Re-introducing the fact that we do not know for how long we are going to live, lifestyle and genes may determine that we live to see 100, but lethal accidents and unforeseen events may also determine that we are cut short at 50 years. When discussing pension schemes, the aforementioned uncertainty is important at the individual level, but it also presents challenges at an aggregate level. Pension reforms are designed to produce a certain macroeconomic (equilibrium) outcome, but the legislation and reforms put in place also needs to be beneficial at the level of the individual and the organizations employing these individuals. Pensions is a case of consumption smoothing (Barr 2004), and a simple Fisher model of rational choice may not be fully adequate to model best behavior.

Rationality in decision-making is a key principle for institutions like the Norwegian Business School. As a foundation, its profit motive is not as clear-cut as for a regular profit maximizing firm, but positive profits provide funding for future research, in itself a worthy cause. In addition, research funding is arguably a factor in attracting academic staff to the institution, benefitting the institution as a whole, the current academic environment and the students. The rationality of the Norwegian Business School is arguably heavily impacted by unforeseen additional costs, and pensions represent one source of such unexpected costs. Modeling the decision-making structure and its influencing factors is a daunting task, and not one attempted in the thesis for which this proposal constitutes a draft.

Research framework

Research question

In order to operationalize and identify the interesting traits of aspects surrounding pension, research questions are necessary in order to provide clear guidelines for the subsequent analysis. The main research question of this thesis will be “*how is the Norwegian Business School affected by pension system design and how does the co-existence of current retirement schemes affect the organization’s rationality in long-term economic planning?*“ In the course of the thesis, each chapter will address partial research questions providing clarity on the main research question being presented. Formulating the partial research questions is not attempted at this point in time as this requires thorough thought and consideration. A master thesis is a substantial amount of work and written pages, but there is nevertheless no room for elements deviating from the core of the problem definition. Keeping the final product closely connected to the research question is one of the key challenges outlined in more detail at the end of this proposal.

Research method and design

This coming thesis will occupy itself with future events and future implications from pension schemes with different service providers. As such, empirical testing will not be available and therefore neither beneficial in its analysis. As a case study, it serves the purpose of detail, but perhaps also generalization, as other organizations may well be in the same situation as the Norwegian Business School with respect to pension regimes. In order to develop a beneficial framework for analysis, the thesis has chosen to use ideal type individuals as its method. This provides the benefit of setting scenarios and estimating the impact on the Norwegian Business School in terms of impact on rationality in planning processes. It does not provide the possibility of statistically testing a hypothesis at a given significance level, but at the same time, this is not the intention of the thesis and does not constitute any concerns whatsoever.

The thesis will develop two main types of individuals, one for the academic staff and one for the administrative personnel at the Norwegian Business School. This is done to capture the differences in service provision between the two retirement schemes provided for the employees. The analytical framework will further separate the ideal types into male and female, as these have different salary projections and life expectancy rates and developments and thereby captures any differences among sexes within and across types of employment. In order to capture development over time, the thesis will place these individuals in different age groups with respect to retirement: Retirement -10, -20 and -30 years, providing fictitious individuals of 57, 47 and 37 years respectively. This will provide variation between academic versus administrative staff and male and female employees concerning salary paths and the influence of tenure effects on the two pension savings schemes. Life expectancy adjustments affect individuals on defined benefit retirement plans with both public and private service providers. The effects are conceived to have different implications for the Norwegian Business School according to service provider. An upward adjustment for a professor is likely to be less continuous than for an administrative assistant. This is due to the time lag in premium adjustments from the Norwegian Public Service Pension Fund compared to adjustments from Storebrand Life Insurance. This aspect will be revealed through interviews with resource personnel from both

service providers and the Department for Accounts and Finance at the Norwegian Business School.

Data

In order to gain full overview over the defined benefit retirement schemes with both the Norwegian Public Service Pension Fund and Storebrand, I will need to conduct interviews and attend briefings with resource personnel with both these actors. I have already initiated contact with Stina Vestby with the Norwegian Public Service Pension Fund and she has agreed to provide input on effects from interest levels and life expectancy adjustments. Formal contact has yet to be established with resources at Storebrand Life Insurance, and this will have to be done at an early stage of the project. In addition, and given the particular tailoring of pension plans according to customer, the thesis will have to rely on sources from the Accounts and Finance department at the Norwegian Business School in order to gain an accurate understanding of the terms and conditions affecting the organization in terms of pension. If this information for some reason or another may not be available, best estimate techniques need to be applied in order to forecast differences between the two types of defined benefit schemes.

Furthermore, the thesis will have to rely on life expectancy data for the ideal type individuals from Statistics Norway and interest level expectations and projections from Norges Bank. The former data is easily and publicly available and the data collection as such should not pose too big challenges. The interest levels are impossible to predict, although some guiding can be read from the interest rate publication by Norges Bank and analysis performed by investment banks and other financial institutions. In the short term, interest level guiding and expectations made do arguably represent little spread compared to the actual levels witnessed in retrospect. On the longer term, this is not feasible given the multi-factor dependence of the interest rate on several indicators, global and domestic. For this reason, the thesis will conduct best case, worst case and average interest levels from the past 20 years and use all three interest rate levels in the analysis for the ideal type individuals. This is perceived to provide a

nuanced picture of how interest rates affect the pension costs for the Norwegian Business School towards their employees' defined benefit retirement plans.

Preliminary thesis outline

The final thesis will consist of three main sections. The first section will consist of an introduction to the thesis in general, the pension regime in Norway and particular focus will be attributed to the two pension schemes covering the academic and administrative employees at the Norwegian Business School. This first section will also include chapters on the problem definition, the research question, chosen method and the data needed.

Section two will comprise of the analysis on effects from the different ideal types, and conclusions on effects from interest rate levels and life expectancy adjustments. In addition, this section will include perhaps the most important and interesting part of the thesis; the discussion chapter. The third section will provide the reader with a summary of the research contribution from the thesis and perspectives on further research on the topic of pensions in general and occupational pensions in particular.

Contributions of the thesis

Overall objectives

The overall objective of this thesis is to produce insight into the possible adverse effects for an organization included in defined benefit schemes with public and private providers. It will elaborate on the impact from costs connected to pension funding for employees influence rationality on long-term decision-making for an organization, and also discuss consequences of this impact. It will provide insight into, and discuss, how a change from a public service provider, the Norwegian Public Service Pension Fund, to a private service provider may affect the attractiveness of the Norwegian Business School in the competition for academic labor compared to Norwegian public institutions like universities, university colleges and business schools in which it is in competition with today. By shedding light on the co-existence between publicly and privately managed

pension schemes it can also provide general relevance and applicability to other organizations with a similar split with respect to pension schemes. Public debates over pensions are to date most concerned with the impact for employees and apart from the dichotomy defined benefit versus defined contributions, less concerned with impact on the employer side. Pensions are complex, also in Norway, and I view all contributions intended to, and successful in, improving knowledge of effects and implications beneficial to employers and employees alike.

Interesting possible discussions connected to the thesis

One of the key themes that will have to be included in the thesis is “what constitutes a good pension plan, or a good arrangement?” This can be seen from two angles, that of the plan benefactor and that of the plan beneficiary. The main perspective of the thesis will be from the position of the plan benefactor, the Norwegian Business School. This theme also brings about the question of loyalty from the workforce versus predictable costs for the organization, an interesting theme indeed and one that is most likely to receive attention in the final thesis. Also, questions of interactions between organizational objectives and implications from pension regime are ones of high interest to this author and the thesis. If defined benefit plans are much less beneficial in terms of decision-making and planning rationality, why is it then kept around and not replaced with a defined contribution plan offering precisely such a certainty in costs? Interesting question indeed, and not one easily concluded upon.

Outline for progression

Planning ahead on a project like this is difficult and I suspect the timetable needs to be adjusted according to feedback on this proposal and the general progression of the various elements constituting the final thesis. Even still, I believe it is beneficial to provide the supervisor with my initial thoughts surrounding the progression of the thesis. Also, the progression needs to be adjusted according to my supervisor’s timetable given his new assignment and the table below is in essence more of a thought experiment than anything set in stone with respect to progression.

January	<ul style="list-style-type: none"> • Establish contact and determine first interaction with resource personnel intended to provide a complete picture of the two pension schemes. • Collect information on internal work on the pension theme from the Norwegian Business School management.
February	<ul style="list-style-type: none"> • Complete chapter on the two pension schemes. • Gather necessary data, and create ideal type individuals, interest levels and life expectancy data. • Complete chapter on research methodology and problem definition.
March	<ul style="list-style-type: none"> • Analyze the implications for the organization by calculating the different cost levels at different interest rate and life expectancy levels. • Complete analysis section.
April	<ul style="list-style-type: none"> • Write discussion section based upon the analysis.
May	<ul style="list-style-type: none"> • Primo: complete analysis and discussion sections. • Ultimo: Finish first draft of complete thesis.
June	<ul style="list-style-type: none"> • Medio: finish review of first draft • Ultimo: produce second draft • Make arrangements for printing final thesis.
July	<ul style="list-style-type: none"> • Complete thesis by medio July.
August	<ul style="list-style-type: none"> • Send thesis to print according to arrangements.
September	<ul style="list-style-type: none"> • Hand in final printed thesis.

Challenges in producing the final thesis

One key challenge that has been outlined in our supervisor sessions is to allow for adequate time in finalizing the thesis. In order to allow for this, the progression needs to be continuous and also the production of first and second drafts needs to be timely. These perspectives are sought through collaboration with the thesis supervisor. Another key challenge is to produce adequate ideal type individuals. Thorough research needs to go into this before an analysis is to take place. A framework for dialogue with the Norwegian Public Service Pension Fund, the

Department for Accounts and Finance at the Norwegian Business School and Storebrand Life Insurance is needed in order to be able to produce this. As mentioned earlier, an important aspect in producing an interesting and concise thesis is to not deviate from the problem definition and get caught up in other interesting aspects not entirely relevant to the research being conducted.

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