



BI Norwegian Business School - campus Oslo

GRA 19502

Master Thesis

Component of continuous assessment: Forprosjekt, Thesis
MSc

Preliminary Master Thesis

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Start: 01.01.2018 09.00

Finish: 15.01.2018 12.00

Equity Allocation in the Government Pension Fund Global

Study Program:
Master of Science in Business
Major in Finance

Supervisor:
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Introduction

Since the Government Pension Fund Global was founded in 1990, the equity allocation has been up for debate at several occasions. For the first few years, the fund exclusively invested in government bonds. After 1998, the fund was no longer restricted to government bonds, and the allowance for equity investments were set at 40 percent. Close to a decade later, in 2007, the Norwegian Ministry of Finance increased the equity allocation to 60 percent (NBIM, 2017a). Further, the Mork commission recommended in the fall of 2016 to increase the equity share of the fund from 60 to 70 percent (NOU 2016:20, 2016). At the same time, Norges Bank made their own recommendation to the ministry of Finance to increase equity allocation to 75 percent. As a result of the continuous development in investment strategy, the allocation to equities were increased once again to 70 percent (NBIM, 2016a).

In our thesis we will explore the question: *“What is the optimal equity allocation in the GPF Global considering risk and expected return?”*

The first part of our preliminary master thesis will focus on the Government Pension Fund Global. We will specifically concentrate on discussing the equity arguments behind the previous asset allocation decision.

In the second part, we will introduce relevant peers, the Canada model and the Yale model, and give examples of two funds that apply these models. We will also compare characteristics of the models to the Government Pension Fund Global.

In the third part, we will explain how we will gather the data and progress with our thesis.

Government Pension Fund Global

Oil and gas revenues has made Norway one of the wealthiest nations in the world over the past decades. As a result of the State budget surplus, the Norwegian government founded Government Pension Fund Global and decided that the surplus was to be reinvested in financial fortune abroad. This way the wealth could benefit future generations, as well as avoid the well-known resource curse (Dutch disease). The strategy of the fund is to take advantage of the long investment horizon and its tremendous size to generate satisfying returns and shield the wealth for future generations.

At the end of September 2017, the total market value of the Government Pension Fund Global (GPFG) were NOK 7952 billion (NBIM, 2017b). The fund has an infinite investment horizon, where only the expected annual long-term real return of the fund is supposed to be spent to cover the oil-corrected budget deficit in the Norwegian State Budget. GPFG's goal is to have a well-diversified portfolio that generates the highest possible returns with a moderate risk profile. Norges Bank states, that the fund is likely to take short-term losses and expects losses of approximately 11% in one of three years, and twice the loss every twentieth year if the fund has 75% allocation to equity. The funds ability to recover from losses has been proved effective during the financial crisis and the technology crash. Due to rebalancing, the fund was one of the largest buyers of stocks during these crashes, and made it through the turbulent markets better than most institutional investors (Chambers, Dimson & Ilmanen, 2012). The main risk factors that the fund is exposed to is the allocation of equities, stock price movements, currency and interest rate risk in addition to credit risk (NBIM, 2016b).

At the end of September 2017, the fund's asset allocation consisted of 65.9 percent equity, 31.6 percent fixed income and 2.5 percent unlisted real estate (NBIM, 2017b). In 2017, the Norwegian government made a strategic change to increase the allocation to equity to 70 percent, and therefore allowing for higher risk. GPFG has limited liquidity needs, but prefers investing in liquid assets. The investment universe for the fund is under continuous development, but for now the fund only invests in public equity. The fixed income investments include government bonds, corporate bonds and securitized debt. The third investment

category is unlisted real estate, with investments in high-quality office or retail properties in selected cities around in world. A distinctive feature of the fund is that all capital is invested abroad. This is to avoid overheating of the Norwegian economy and to protect it from the effects of oil price fluctuations (NBIM, 2017c).

Modern investment theory is a variety of the general Keynesian investment framework. In this theory all investors possess the same information, and have the same expectations about future returns. The Norway model is originally built around the idea that no investor can make excess returns (Ambachtsheer, 2015). However, the fund has some degree of active management, which means they believe it is possible to make excess returns. The current strategy has been developed over time with input from experts, in-depth analysis and practical experience (NBIM, 2017d).

The fund utilizes both internal and external managers. At the end of 2016, the fund used a number of external institutions to manage both equity and fixed income investments. A total of NOK 336 billion was managed by external managers with “specialist expertise in clearly defined investment areas” (NBIM, 2017e). The purpose of the external managers is to make excess returns by beating the market. The external and internal managers manage about 20 percent of the equity in active management. According to McKinsey on behalf of the Norwegian Ministry of Finance, the external management costs are substantial compared to the internal management cost. The internal asset management costs on global stocks are 2.4 bps, while the external asset management costs range from 23.4 to 30.4 bps depending on region. However, the total costs in GPFG is significantly lower compared to relevant peers. Total costs excluding transaction costs is 5.3 bps compared to 16.4 bps for a weighted peer median. Some of the cost advantage can be explained by the scale of the GPFG, because the peer median in the McKinsey analysis manage only about 20 percent of the funds that GPFG manage (McKinsey & Company, 2017)

GPFG’s governance model has been laid down by the Norwegian parliament. The model is based on clear delegation of responsibilities and systems for control and supervision. Furthermore, the general responsibility for the fund’s management is

assigned to the Ministry of Finance, but Norges Bank is responsible for the day-to-day management of the fund (NBIM, 2017c).

Equity arguments

In this part, we will use current market conditions and fund characteristics to explain reasoning for both increase and decrease in equity allocation for GPFG.

The expenditure of the fund over the Norwegian government budget, over time should not exceed the expected real return of the capital in the fund. Oil and gas are non-renewable resources and should therefore be managed in a sense that benefits future generations. In the recent years, the value of the fund has increased substantially, and as a result the spending rule (*Norwegian: Handlingsregelen*) is lowered from four to three percent. The rule states, that extractions from the fund normally should not exceed the expected real return, which now is estimated at three percent. If payout rate exceeds the real return, the fund decreases in real value. This illustrates a threat to the main objective of the fund, to benefit future generations. The Mork committee (*Norwegian: Mork utvalget*) calculated in their analysis an expected real return of 2.3 percent in the next 30 years with equity level at 60 percent. With an equity share of 70 percent, the expected real return for the next three decades increased to 2.6 percent. Hence, even with increased equity share the fund is not sustainable in real terms with the current payout rule.

The Norwegian population is aging hence current spending is only sustainable if the government implements pension reforms etc. instead of draining the fund. Another way to keep the fund sustainable in the long run is to increase the equity share of the fund. However, an increase in equity also increases the funds risk profile. The committee concluded that higher risk was acceptable because the expected annual real return on stocks (3 percent) are significantly higher than the expected real return on bonds (0.5 percent). A minority (Mork) voted to lower the equity share to 50 percent, and based this recommendation on the need to avoid large fluctuations in the fund value, and emphasized the importance of providing the fiscal policy with steady access to capital. The Norwegian State Budget for 2018 consists of 17.4 percent oil money, hence large fluctuations in fund value

can be troubling for the fiscal policy. This alone speaks for a lower risk tolerance (E24, 2017).

The Federal Reserve (FED) has announced that they will gradually reduce its USD 4.5tn balance sheet, to unwind quantitative easing (Financial Times, 2016). Quantitative easing is an unconventional monetary policy of purchasing copious quantities of long-term securities, with the objective to lower interest rates, and hence stimulating the economy. There exists significant evidence that QE has the desired effect on long-term interest rates (Krishnamurthy & Vissing-Jorgensen, 2011). As central banks around the world reverse their QE programs, interest rates are likely to increase, and bond prices drop. The current market conditions with expected future falling bond prices is an argument that fixed income allocation should not be increased, because of expected underperformance. This combined with the historically low interest rates, point towards a lower allocation to fixed income securities. Most members in the Mork committee wanted to reduce the allocation to fixed income (B. Gerard, personal communication, May 16, 2017).

Furthermore, the transformation from petroleum fortune in the ground to financial fortune abroad, pulls in the direction that the fund can handle a higher equity share. According to B. Gerard, transforming risky oil and gas resources into financial assets, the fund can increase the risk profile in the financial portfolio and still reduce the total risk in the Norwegian asset portfolio due to the diversification effect (personal communication, May 16, 2017). The committee put emphasis on the fact that the transformation to financial fortune has made the petroleum-fortune more diversified now than it was back in 2007 when equity was increased to 60 percent, and that the fund therefore is capable to bear more risk.

The fund has an infinite investment horizon, with the objective to benefit future generations. As a long-term investor it can be argued that the fund is more tolerable towards risk. Given the low expected real return the next 30 years, more risk must be taken for the fund to succeed with its current objective of increasing purchasing power. The petroleum inflow increases the horizon of the fund, as well as its sustainability (Chambers, Dimson & Ilmanen, 2012). Inflows are expected to last for many years to come, but are expected to decrease as renewable energy gets a stronger grasp on the energy market. First, when inflows stop the fund must

be sustainable on its own, making the spending rule critical for the fund to succeed with the objective of benefiting future generations.

Peer comparison

In order to find the optimal equity allocation for GPF, peers need to be analyzed. Peers are large institutional investors such as pension funds, endowments and sovereign reserve funds. This part will compare two of the most relevant models, the Canada model and the Yale model.

The Canada Model

The Canada model is currently being used by the Canada Pension Plan Investment Board, Ontario Teachers' Pension Plan, and other major Canadian pension funds. It is a relevant competitor to the Norway model because of its comparable size asset pool and its intellectual foundation. The Canada model descends its intellectual foundation from frameworks developed by John Maynard Keynes and Peter Drucker (Ambachtsheer, 2015).

Keynes' framework lays out the fundamental investment philosophy of the Canada model. The framework separates investing through 'beauty contest' and real investing. In 'beauty contest' investors try to identify and buy stocks that will shortly become popular, and then sell them for higher returns. In contrast, in real investing, uncertain cash-flows are calculated into future values and compared to a pre-established minimum rate of return (a 'turn saving into productive capital' investor). An investor can choose to either join the 'beauty contest' game, become a low-cost passive investor or become a 'turn savings into productive capital' investor by acquiring the essential skills. The Canada model prefers the last option and excludes the option of the 'beauty contest' (Ambachtsheer, 2015).

Drucker's framework is based on five critical organizational aspects: mission clarity and organizational autonomy, good governance, sensible investment beliefs, right-scaled and right-peopled. The Canada model has a clear mission statement, and the business structure has harmony between organizational

accountability and autonomy. In contrast to the Norway model, an experienced independent board oversees the fund with a support from an appointing committee. The organization's investment beliefs are based on the investment frameworks by Keynes. In addition, with support from investment strategies built to suitable scale, competent internal teams invest in global private markets through active management (Ambachtsheer, 2015).

The Canada Pension Plan Investment Board

The Canada Pension Plan Investment Board (CPPIB), which was established in 1997, oversees and invests the funds of Canada Pension Plan (CPP) on behalf of its 20 million Canadian contributors and beneficiaries. At the end of September 2017, CPP had a value of NOK 2103 billion (CAD 328.2 billion) (Norges Bank, 2017a), which is equivalent to one quarter of the size of GPF (CPPIB, 2017c). CPPIB has a long-term horizon as it aims to pay pensions and meet its current and future financing needs by raising the value of its assets. Its goal is to maximize returns without taking excessive risk. To reach this, CPPIB is prepared for occasional up-and-down turns in the market and forecasts minimum of 12 percent losses every ten years (CPPIB, 2017a).

Long-term risks that could increase CPP contributions or decrease CPP benefits are the base for setting the fund's risk level. The major risks CPP faces are longevity, an aging population, and Canadian economic growth and employment. In addition, real wage growth, birth rates, demographics and immigration affect the fund. CPPIB finds climate change both as a risk as well as an opportunity (CPPIB, 2017a).

CPPIB believes that a portfolio consisting of 40 percent global public equities and 60 percent Canadian government bonds offers the lowest level of risk to achieve the net real return required to maintain the CCP. However, higher justifiable risk level will result in better returns. At the end of March 2017, CPPIB invested 55.4 percent in public and private equities, 21.5 percent in fixed income, and 21.3 percent in real assets. Compared to GPF, CPP has a higher allocation to equity and equity-like assets (CPPIB, 2017a).

From March 2000, CPPIB's investment portfolio has changed significantly, as 95 percent were invested in fixed income and only 5 percent to equities. In 2014, CPPIB decided gradually to increase the risk level up to 85 percent in global equities and 15 percent in Canadian government bonds in the coming years. The increasing maturity, scale and best forecasts for long-term economic and capital market factors are considered when the risk level is re-evaluated every third year. CPPIB has experienced a similar development as GPFG with a gradual increase in allocation to equity over the past 20 years (CPPIB, 2017a).

Currently, CPP benefits are paid entirely with CPP contributions. However, the Chief Actuary of Canada has estimated that in 2021, CPP will need to start using a portion of investment income in addition to CPP contributions. CPPIB forecasts that 65 to 70 percent of contributions and 30 to 35 percent of investment returns will finance future benefits. As a result, the fund will grow at a lower pace (CPPIB, 2017a).

Like GPFG, CPPIB engages in both passive and active management. Instead of only investing in an index-based portfolio, CPPIB buys and sells individual securities that it believes are temporarily mispriced. The external and internal managers manage about 23 percent of the assets in active management. To justify active management, CPPIB compares its returns against a reference portfolio that holds public market indexes to ensure superior returns are delivered. Through active management, CPPIB takes advantage of large-scale transactions, private market deals as well as structural changes and trends. CPPIB also engages in strategic tilting, which temporarily moves asset allocations and factor exposures to other direction from the portfolio's long-term objective. This strategy provides extra flexibility for the active managers, in contrast to GPFG (CPPIB, 2017a).

CPPIB invests in more than 40 countries, and therefore the fund is exposed to currency risk. Foreign investments are not hedged, because it does not benefit the fund. In terms of increased earnings and higher CPP contributions occurs natural hedge, when Canadian dollar appreciates against other currencies. Moreover, hedging increases inherent risk, is costly, and currency risks can be reduced with diversification (CPPIB, 2017a).

CPPIB's governance model is globally recognized as outstanding example for national pension plans. CPPIB operates independently from the CPP and from the federal and provincial governments, whereas GPFG is under government control. Their main responsibilities are approving investment policies, deciding strategic direction and making key operational decisions. An independent Board of Directors provides overall direction to CPPIB (CPPIB, 2017b).

The Yale Model

The Yale University Endowment model is a leading model of endowment management, which makes it a coherent competitor to the Norway model. It offers financial aid to students who cannot afford the cost of college education. At the end of June 2017, the Yale fund had a value of NOK 228 billion (USD 27.2 billion) (Norges Bank, 2017c), with inflows coming from annual returns and gifts from donors (Yale Investment Office, 2017a).

Like the Norway model, the Yale fund has clear missions and objectives as well as detailed investment philosophies (Rozanov, 2015). In 1986, over 80 percent of the fund was invested in domestic marketable securities and cash. Today, about 90 percent of the assets are producing equity-like returns, invested in foreign and private equity, absolute return strategies, and real assets. The remaining 10 percent is invested in domestic marketable securities (Yale Investment Office, 2017a). The goal is to earn high returns such that the spending for current operations as well as purchasing power of assets can be maintained. Yale's Investment Committee accepted changes to the fund's portfolio allocations in June 2016, by increasing the targets by maximum of 2.5 percent in venture capital, absolute return, foreign equity and cash. Fixed income, leveraged buyouts, natural resources and real estate targets were decreased by maximum of 3 percent. According to the Committee, these changes guarantee the long-term growth rate of 6.9 percent with 13.7 percent risk (Yale Investment Office, 2017b).

Similarly to GPFG, the Yale fund also operates with an annual spending rule and have no defined future liabilities (Rozanov, 2015). Its spending rule assures a guaranteed steady income to the operating budget while making sure the real

value of the fund maintains. The current spending rate is 5.25 percent (Yale Investment Office, 2017b).

In some ways, the Yale model is opposite from the Norway model. The Yale fund's governance is independent from political process and it is under supervision of Yale's Investment Committee and management of David F. Swensen. Another difference is that external managers manage most of the Yale fund. In addition, the Yale fund's portfolio is composed of academic theory and informed market judgement. The academic theory derives its foundation from mean-variance analysis, which was developed by Nobel laureates James Tobin and Harry Markowitz. In the Yale model, markets are assumed to be inefficient so investment managers can exploit market misprices (Yale Investment Office, 2017a). Its intergenerational investment horizon is ideal for finding mispriced investments through active management. Finally, the fund mainly concentrates on illiquid securities and private markets. However, after the financial crisis, the Endowment has concentrated on reducing illiquid assets (Rozanov, 2015).

Australian Future Fund

Australia's Future Fund (AFF) is not a perfect copy of the Yale model but it is one of the most similar among pensions and sovereign wealth funds (Rozanov, 2015). At the end of June 2017, the fund had a value of NOK 860 billion (AUD 133.5 billion, (Norges Bank, 2017b), which proves that the Yale Model is scalable to larger funds. AFF's purpose is to enhance the long-term financial status of the Australian Government by covering the cost of unfunded public sector retirement liabilities. Capital inflows to the fund come from contributions from budget surpluses, and sale and transfer of government shares. However, since 2007, there has not been additional contributions to the fund, which was not the intention at the time of establishment (Australian Government Future Fund, 2017a).

The governing legislation rules the size of capital transfers from the fund to cover for the Commonwealth's unfunded pension liabilities. To avoid draining the fund, it was determined that withdrawals to pay superannuation benefits should not occur until the superannuation liability is fully offset. The government has decided not to make any withdrawals for at least for the next 10 years, as they

want to improve the long-term financial situation. In case withdrawals starts in 2020, in full amount of annual liabilities, the fund would be drained and AUD 275 billion of superannuation liability would remain in 2046 (Australian Government Future Fund, 2017a).

The fund's investment mandate is governed by the Australian Government and its goal is to "achieve an average annual return of at least the Consumer Price Index plus 4 to 5 percent per annum over the long term, with an acceptable but not excessive level of risk" (Australian Government Future Fund, 2017b). Until the end of June 2017, the mandate's goal was 0.5 percent higher but was decreased due to a shift in global market circumstances and expectations. The lower average annual return outlines the current belief between risk and return. Investment risk contains of macro, market, liquidity, inflexibility, specific, investment manager and counterparty risks . All foreign investments are hedged to offset the currency risk (Australian Government Future Fund, 2017a).

At 30 June 2016, AFF invested 40 percent in equity, 32 percent in fixed income and 28 percent in real assets. The equity and equity-like assets account for 68 percent for both GPF and AFF. These portfolio weights are flexible since AFF does not follow a fixed strategic asset allocation, and therefore does not have a reference portfolio. Instead, the fund measures performance using a fixed allocation that represents the average level of risk over time (Australian Government Future Fund, 2017a).

Compared to GPF, AFF is made as autonomous as possible. It is governed by 'the Board of Guardians', which consists of experienced independent members. The Future Fund Management Agency, an Australian Government agency, gives consultation and advice to the 'Board of Guardian'. 'The Future Fund Act 2006' legislates the governance of the fund (Australian Government Future Fund, 2017c).

In contrast to GPF, the investments strategies are carried out exclusively through external managers. Total active management costs were 29.5 basis points in 2015-2016, which accounts almost six times more than Norway's total management costs. (Australian Government Future Fund, 2017c).

Data

We will compare historical returns of the pension fund to the reference index, and forecast future returns. To do this, we will need a reference index to compare fund performance with different portfolio weights. We will use Bloomberg and/or other financial databases to collect data. In case the current reference index is not tracking the historical returns appropriately, we will make necessary adjustments it. The forecasted future returns need to be transformed into real returns in order to investigate whether the real returns are higher or equal to the current payout rate of three percent in the long term.

We will also study the funds inflows and outflows, to inspect what share of the total wealth originates from deposits and returns as well as from withdrawals. Further, in the quantitative peer analysis, we will use modern portfolio theory to calculate key measures to find the optimal allocation. In the pursue, we need to analyze annual reports, and other information provided by the funds as well as independent sources.

Next steps

First, we will gather information about asset allocation from relevant literature. Our focus will be on additional factors that could be considered when making allocation decisions. We will also do a literature review about modern portfolio theory. Several financial theories are related to our topic, such as the capital asset pricing model and models by Fama & French. Also, different risk measures such as Sharpe ratio and Jensen's alpha are topics of interest.

Next, we will proceed with data collection as described in the Data chapter. This part will be comprehensive, as we have to gather data from several annual reports, and systemise it. When the data is systemised we can start our analysis. We are aware that not all peer funds are as transparent as GPF, and therefore we may not be able to find detailed historical data for all comparable funds.

Based on the results and our analysis, we will provide our equity recommendation in line with the mandate of the Ministry of Finance.

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