

# COMMOD

## investing:

### a pension fund perspective

*By Jelle Beenen*

Five years ago, PGGM, one of the largest pension funds in Europe, decided to allocate approximately \$2 billion of its investment portfolio to commodities. After an extensive review, the fund decided that the most efficient investment vehicle for its purpose was a total return swap based on the Goldman Sachs Commodity Index. In the following article, Jelle Beenen, the head of commodities and quantitative strategies at PGGM, explains the thought process that went into the pension fund's investment decision and the pros and cons of the various investment vehicles.

PGGM provides a comprehensive and broad-ranging pension package to approximately 1.9 million current and former employees in the healthcare and social work sector in the Netherlands. The fund has around EUR 65 billion under management, which makes it the second largest pension fund in the Netherlands and one of the largest in Europe.

Looking at the development of PGGM's strategic asset mix through time, one can see a gradual reduction of the allocation to fixed income. That has to do with PGGM's ambition to provide a pension that grows with wage inflation. To match the resulting liabilities exclusively with (index linked) fixed income would require unacceptably high contributions from the plan's sponsors, namely, the employees and employers.

To reduce the contributions, a growing portion of PGGM's investment portfolio therefore has been invested in higher yielding assets. What is remarkable is that the reallocation out of fixed income has not exclusively gone to equities, but also to alternative assets like real estate, private equity and commodities. Currently we invest about 5% of our assets in commodities, and alternative assets as a whole account for about 22% of our portfolio.

Naturally, higher yielding assets also bear higher investment risk, so as our allocation has changed, the need for diversification has grown. Diversification should ensure that the desired return is achieved at the lowest level of risk. For PGGM, the added value of commodities comes more than anything else from its power to reduce the overall risk without sacrificing the expected overall return.

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## Commodities as a Strategic Investment

To study the suitability of commodities as an asset class, PGGM used very conservative and prudent assumptions about the risk-return characteristics of commodities as a stand-alone investment. We assumed that commodities would have a return just below that of fixed income and a volatility higher than equities and private equity. This made commodities a poor stand-alone investment: the lowest expected return and the highest risk of all asset classes. The added value of commodities therefore should be derived from either its positive correlation with PGGM's liabilities, and wage inflation in particular, or from the negative or low correlation with other assets, providing diversification.

The added value of commodities from its positive correlation with wage inflation is limited. It is true that commodity prices generally have a positive correlation with inflation, but it would require a very high allocation to commodities for this correlation to provide a substantial reduction in PGGM's sensitivity to inflation. However, when it comes to the diversification power of commodities, a little goes a long way. Here the real added value comes out. Reducing an allocation to fixed income/equities/real estate by 20% and investing this 20% in commodities would reduce the required contribution from PGGM's sponsors by more than 15% without increasing the total amount of risk. This justifies a passive long-only allocation to commodities, even if the expected yield is not very high. More active ways to invest in commodities might or might not deliver higher returns, but would not necessarily deliver the diversification.

In early 2000 PGGM decided to commit a small percentage of its assets to commo-

ties. We limited the allocation to 4% because of the novelty of commodities to PGGM and the total size of the market at that time. Today the amount invested in passive long-only commodities programs is estimated at \$40 billion, but in early 2000 it was just \$6 billion. Even a relatively small 4% allocation added around \$2 billion to that, giving PGGM a 25% share of the total.

Though the 4% allocation might seem small compared to the 20% to 25% optimal allocation that some studies have recommended, it has enabled a substantial reduction in the required contributions from PGGM's sponsors. From our point of view, what matters is not so much the size of allocation in terms of assets, but the amount of risk it represents in our portfolio. The amount of risk represented by this 4% allocation to commodities, measured by the monthly value at risk, is comparable to fixed income and real estate, although they have a much higher



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**—Jelle Beenen, PGGM**

allocation in assets. That has everything to do with the high volatility of the commodity markets.

Another illustration of the strong impact that a rather small allocation to commodities can have is the return that this has generated. More than 50% of the total return of PGGM in the first quarter of 2005 was attributable to the less than 5% allocation to commodities.

## Search for a Suitable Benchmark

For PGGM it was clear from the start that using futures rather than commodities linked equities was the most efficient route to gain exposure to commodities. In our analysis, the problem with commodity-linked equities, and in particular oil companies, is that they have a stronger correlation to general equity indices like the S&P 500 than to the underlying commodity prices. This reduces diversification—the primary purpose of our investment in commodities.

Moreover, an important component of the return from commodity futures comes from rolling contracts that are near expiration. This roll return, which is particularly true for energy futures, further adds to diversification and cannot be obtained by investing in commodity companies. Actually commodity companies are partly responsible for maintaining the shape of the term structure from which the roll return is derived. In that sense they are indirectly paying the roll premium to the investors with long positions in the futures.

Consequently PGGM had to find a benchmark for a passive long investment in commodities futures. This benchmark had to meet the following requirements:

- The benchmark should capture the distinguishing characteristics of the asset class. The diversifying properties of commodities should be clearly present in the benchmark.

- The benchmark should be replicable. This, for instance, excluded benchmarks that needed rebalancing with every tick move.
- The market should provide products based on the benchmark, such as futures, structured notes and options on the index.
- Various counterparties should be available. This excluded proprietary indices.
- There should be sufficient liquidity in the futures contracts that constitute the index.
- The construction of the benchmark should be totally transparent, based on generic rules rather than arbitrary (opportunistic) ones.
- The benchmark should be easily accessible, for instance by daily quotations on Bloomberg or Reuters.

From the benchmarks available in early 2000, PGGM found only two that met these requirements: the Dow Jones-AIG Commodity Index and the Goldman Sachs Commodity Index. The DJ-AIG index distinguishes itself from the GSCI by limiting

the weight of a particular commodities sector. The main effect is that the DJ-AIG index has a considerably lower weight in energy futures than the GSCI. Therefore the GSCI has a much higher volatility than the DJ-AIG index.

Many consider this as a major disadvantage of the GSCI. If the indices are viewed as stand-alone investments, they have a point. PGGM, however, viewed commodities in the context of the fund's total assets and liabilities. In that context we preferred the higher volatility of the GSCI to the lower volatility of the DJ-AIG index. The paradox is that the GSCI, although more volatile in itself, reduced the volatility of the overall portfolio more than the DJ-AIG index. The GSCI Total Return thus became the benchmark for PGGM's investments in commodities.

### A Preference for Energy

For similar reasons, PGGM decided in early 2002 to change the benchmark to 75% GSCI Total Return and 25% Goldman Sachs Energy Subindex Total Return. This gave us an even higher energy content and consequently a higher volatility. In 2005 we went further, increasing the energy subindex weighting to 40%. PGGM clearly prefers energy to non-energy commodities. The reasons for this preference are:

- Energy has the clearest link to the global economy, and therefore implicitly supplies the best diversification with traditional assets.

- Energy is relatively difficult to transport and store and more susceptible to supply chain bottlenecks. The premium for short-term delivery, reflected in the shape of the futures curve, is therefore higher for energy than other commodities. In other words, the roll return for energy is higher.
- Over the long term price movements have contributed little to the return, as commodities prices tend to mean revert to inflation/cost of production. Long-term passive investing in energy therefore receives a yield for providing risk capital to the market via the roll return rather than speculating on price movements.
- The roll return in energy is the highest when the market expects supply disruptions. This often coincides with periods during which financial assets are not doing well. In this way, the roll return adds to diversification.
- Energy is better in providing a hedge against geopolitical crises.
- Although a commodities benchmark with higher energy content is more volatile, the volatility of the overall mix decreases and the expected return increases.
- Based on return and correlations, energy can be considered a different asset class from other commodities.

The customization of its commodities benchmark has served PGGM well. Since implementation of the higher energy content, energy has outperformed the non-energy commodities by more than 200%.

### Choosing the Right Investment Vehicle

The next implementation issue was to determine the best method to make the investment, taking into account three important considerations: cost, tracking error, and claim on internal resources.

With respect to the tracking error, PGGM initially looked for as low a tracking error as possible. Since diversification with other assets was the primary reason to invest in commodities, it did not make sense to potentially sacrifice this property for a little bit of extra alpha from active management.

The first question to ask is: internal or external management? Since PGGM at that time was totally new to commodities, naturally we looked at external managers. We quickly decided against this, however, mainly because at the time the managers with commodities expertise were too expensive and their investment programs had too much tracking error. Another possibility that PGGM did not pursue was that of structured notes and commercial paper based on the GSCI Total Return. For a large institutional investor like PGGM, cheaper and more flexible ways of investing are available.

The ultimate internal management vehicle is replication of the benchmark by managing and rolling in house the individual futures that constitute the benchmark, or a representative smaller basket. Arguably this is the lowest cost option. However, it didn't compensate for the potentially high tracking error and the huge impact on PGGM's internal organization. At the time, in 2000, PGGM did not use futures structurally and the infrastructure, systems and procedures for this were still in development.

Managing and rolling index futures on the GSCI itself was another possibility. The rolling process here is possibly a bit less labour intensive than rolling all the individual futures. Still, for PGGM the disadvantages of in-house futures remained: potentially high tracking error and a large impact on the internal organization. Added to that, there were concerns about the lack of open interest in the index futures.

### The Advantages of Using Swaps

PGGM therefore chose a hybrid between internal and external management: the total return swap. The total return swap is an over-the-counter derivative structure in which PGGM receives the index total return from the counterparty in exchange for paying the T-bill component of the index plus fees to

## Diversification Pays Off

### PGGM Investment Portfolio Return

As of June 30, 2005	RETURN (%)				PORTFOLIO	
	Q2 2005	Q1 2005	YTD 2005	5 year*	€ bln	in %
Equities	4.6	2	6.7	-5.4	30.6	47.2
Fixed-income	3.2	0.9	4.1	7.2	19.9	30.7
Commodities	-4.4	25	19.4	12.7	3.1	4.7
Real Estate	3.5	2.6	6.2	10.8	6.9	10.7
Private Equity	5.7	3.8	9.6	-3.1	3.1	4.8
Portfolio of Strategies	0.4	4.5	4.9	-	1.2	1.8
<b>Total</b>	<b>3.6</b>	<b>2.8</b>	<b>6.6</b>	<b>3.3</b>	<b>64.7</b>	<b>100.0</b>

**Note:** The return figures above are after costs and include the effects of the 100% currency hedge.

\* Average annual return based on TWR (Time-Weighted Return)

Source: PGGM

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the counterparty. This structure provides a zero tracking error for the commodities exposure. The fees cover the transaction costs for rolling the futures and compensate the counterparty for taking on the intra day rolling risk. Although PGGM was able in the first year to negotiate around 50% of what was initially quoted, the fee levels were still quite high compared to the costs of rolling futures oneself. This had a lot to do with the relative lack of counterparties willing to engage in a total return swap on the GSCI. In 2000 PGGM only found four suitable counterparties. With the recent growing popularity of commodities as an asset class, one should easily find more than 10 today. Fees have come down accordingly.

Even with the high fees in 2000, total return swaps were cheaper than asset managers. They also provided us with the flexibility of internal management; we were able to manage the commodities exposure by getting in and out of the swaps as desired. In addition, we felt that using total return swaps, even though more expensive than replicating the benchmark ourselves, was preferable to the potentially high tracking error of managing and rolling futures in house. In effect, this approach outsourced the rolling of futures near expiration to the swap counter-

party, thus limiting the claim on PGGM's internal organization. In this way internal resources can be focussed on other purposes, such as possible active investment opportunities that may yield more than what would have been saved the costs of the swaps.

Total return swaps do require some derivatives expertise. But, because of the zero tracking error, in principle no specific commodities futures expertise is required to get the exposure to the commodities index. The total return swap is a very clean way to get "beta" if one is prepared to pay the fees for it. Although the bulk of PGGM's benchmark

## A Longer Term Perspective

Annual Percentage Returns on PGGM's Investment Portfolio					
	2004	2003	2002	2001	2000
Equities	12.0	23.8	-22.8	-12.7	-4.4
Fixed-income	6.3	4.7	9.5	6.0	7.5
Commodities	20.9	23.3	35.5	-32.8	12.1
Real Estate	12.6	8.6	9.1	9.8	14.2
Private Equity	16.7	3.8	-16.7	-24.8	32.9
Portfolio of Strategies	-	-	-	-	-
<b>Total</b>	<b>10.9</b>	<b>15</b>	<b>-7.3</b>	<b>-6</b>	<b>3.4</b>
Total return since 1970	8.9	8.8	8.6	9.4	10.1

Source: PGGM

investments is, and remains, implemented via total return swaps, in the last 18 months a small amount has been implemented via replication with futures. The purpose is to keep a “toe in the water,” and to get a feeling for the costs of rolling.

Some practical issues have to be resolved in order to use total return swaps. Like futures, swaps do not require full funding, so the capital allocated to commodities has to be invested in something else. If one doesn't want to introduce leverage within the commodities portfolio, this capital has to be invested in cash. The effect of this shouldn't be underestimated. Our investment in commodities meant that PGGM's treasury department had to run a permanent money market investment of more than €2 billion. Customized money market mandates with specialist managers were set up to run part of that money.

Another important practical issue is the counterparty risk arising from the over-the-counter character of the total return swaps. This requires ISDA agreements in place with all swap counterparties. PGGM moreover requires monthly resets where the accumulated marked to market of the swap is paid out, which limits the counterparty risk to the monthly accumulated index return. For the intra-month counterparty risk one can add collateral support annexes to the ISDA agreements.

### What About Alpha Possibilities?

Although PGGM started implementing its commodities exposure aiming for a passive investment only, we soon recognized that

commodities provided excellent possibilities to derive extra return from taking active risk. Since then commodities have successfully contributed to PGGM's alpha targets, within the total active risk budget. In the last five years the commodities desk has grown to three persons. Through time the proportion of time spent on active management has grown at the expense of the implementation of the passive benchmark investments.

Commodities markets have properties that should make them more suitable for finding interesting alpha opportunities than other, more efficient, markets. Unlike many other asset classes, a large number of participants in the commodities markets are not investors. They are producers and consumers, buying and selling commodities in order to keep their industrial processes operating, and hedging their production or consumption. These participants will not act on every investment opportunity that arises in the commodities markets, and their particular behaviour occasionally might create alpha possibilities.

The implementation of the strategic investment (the “beta”) by means of total return swaps with a zero tracking error enables PGGM to consider the alpha possibilities completely separate from its beta implementation. Active positions can be implemented as an overlay by means of long or short positions in individual futures, OTC contracts and the occasional option, while the benchmark exposure is maintained via the swaps. This means, for instance, that PGGM's preference for energy for its strategic commodities exposure by no means implies that its active

positions in commodities are predominantly in energy. Active positions are taken in any commodity future market: energy, industrial metals, precious metals, livestock and agriculture.

There is, however, one link between the active positions (alpha) and the strategic exposure (beta) that one should always be aware of. The alpha positions should never be allowed to undermine the primary reason for the strategic investment in commodities—the diversification with the other assets. For example, in March 2003, during the run-up to the second gulf war, we chose not to underweight energy despite a bearish view on the energy complex. It was important to maintain the exposure to energy just in case the war escalated, which would have caused high oil prices and damaged the return of most of PGGM's other assets. To protect the strategic mix was more important here than just pursuing an alpha opportunity in commodities.

Finally it is important to stress again that PGGM does not consider the high energy content in its benchmark as an active position or alpha, but a strategic decision attempting to maximize the added value of commodities as an asset class in the strategic asset mix.

### Conclusion

PGGM's most important investment decision is the determination of its strategic mix. A passive long only investment in an index of rolling commodities futures serves to increase the expected return of the strategic mix, but most of all to reduce its overall volatility. This added value of commodities in the strategic mix is mainly due to the passive investment in energy futures. The structure of the commodities markets provides interesting active risk opportunities. By implementing the strategic passive positions separately from the active risk positions, it is possible to profit from opportunities completely detached from the strategic reasons to invest in commodities. ■

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