

**Update: Risk adjusted performance measurement of the stock-picking-activity in the**

**Norwegian Government Pension Fund Global**

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Author Note

This report is written on our own initiative on a pro bono basis. We have no economic incentives in writing it.

### **Abstract**

In this report, we update the results from our report "*Risk adjusted performance measurement of the stock-picking-activity in the Norwegian Government Pension Fund Global*" of 4 April 2018.

We assess the performance of the stock picking portfolio of the Government Pension Fund Global (GPFG), hereafter SPP.

*Keywords:* Active Portfolio Management, Government Pension Fund Global, Norges Bank Investment Management, Passive Investing, Risk Adjusted Performance Measurement, Sovereign Wealth Funds, Stock Picking

## **Risk adjusted performance measurement of the stock-picking-activity in the Norwegian Government Pension Fund Global**

The current report is an update to, and must be read in conjunction with, our corresponding report of 4 April 2018.

We start off with presenting performance measurement metrics that were recommended to Norges Bank Investment Management (NBIM) in the Dahlquist, Polk, Priestley and Ødegaard (2015) report. In particular, the report suggested the use of the five factor Fama and French (2015) model. The five factors are the excess return on the aggregate market portfolio, *erm*, the return on a high minus low book to market portfolio, *hml*, the return on a small minus big market capitalization portfolio, *smb*, the returns on a profitability portfolio, *rmw*, and the return on an investment portfolio, *cma*. A measure of performance is the alpha from the following regression:

$$r_t - r_{b,t} = \alpha + b_1 * erm_t + b_2 * hml_t + b_3 * smb_t + b_4 * rmw_t + b_5 * cma_t + u_t$$

We expand the model by adding dimensions and strategies that we know NBIM follow, but that are not covered by Fama and French's factors. These include exposure to onshore Chinese A-shares<sup>1</sup> and emerging markets. We find it difficult to justify including NBIM's factors *defadj* and *term*, and thus exclude these from the current update. We believe it is justified to include the benchmark return as an explanatory factor, as a portfolio manager generally is able to load an exposure different from 1.0 to his benchmark. We find that NBIM and its managers seem to have exchanged exposure to the stock-picking benchmark with other factor-exposures, thus loading less than 1.0 to its own benchmark.

A key point we make is that the set of explanatory factors should be systematic risk factors and systematic trading strategies that span the complete investment universe available to the portfolio manager, something the benchmark portfolio does not.

## References

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Footnotes

<sup>1</sup>Note that trading in such securities historically has been hampered by the Chinese government allocating only limited quotas to foreign investors wanting to trade in mainland Chinese shares. However, NBIM has had such a quota and thus retained the ability for such trading over the entire history we are considering. Further, such restrictions have been significantly loosened over the years. Today, investing in such equities can be performed almost without friction through a system called "Stock Connect", with settlement in the offshore RMB (CNH) currency, as opposed to the domestic and controlled currency (CNY).

## Tables

Table 1

## Explaining Benchmark Portfolios

	SPB	SPB	SEB	SEB
alpha	-0.317*	-0.095	-0.129**	-0.030
erm	1.058*	0.761*	1.026*	0.900*
hml	0.401*	0.150**	0.138*	0.032
smb	-0.083	-0.206*	0.040	-0.093*
rmw	0.273**	-0.151	0.144*	-0.043
cma	-0.151	-0.055	-0.103	-0.069
chin		-0.019		-0.011*
emg		0.297*		0.128*

*Note:* SPB indicates Stock Picking Benchmark. SEB indicates Strategic Equity Benchmark. The table shows results from explaining the monthly returns of these two benchmarks with varying sets of explanatory variables. erm, hml, smb, rmw, cma are all prof. Kenneth French's international research factors and were collected from his website during March 2018. chin is the MSCI China A-shares net index in USD less the risk-free rate, emg is the MSCI Emerging Markets net index in USD less the risk-free rate. All returns are monthly and in USD. Estimation period covers the interval Jan 2013 – Dec 2018. \*, \*\* indicate statistical significance at 5% and 10 % levels of confidence, respectively. Standard errors are adjusted for serial correlation with Newey-West/Bartlett Window and 1 Lags, following Newey and West (1987).

Table 2

Performance 2013:1 2018:12

	$SPB_{excess}$	$SPB_{excess}$	$SP_{totret}$	$SP_{totret}$	$SEB_{excess}$	$SEB_{excess}$
alpha	0.052	-0.005	-0.009	-0.043	-0.135	-0.058
erm	0.040*	0.101*	0.137*	-0.501*	0.073*	-0.042
hml	-0.002	0.046	0.053	0.145*	0.261*	0.161*
smb	0.056	0.082*	0.072**	0.012	0.012	-0.036
rmw	-0.091	0.023	0.015	-0.072	0.038	-0.094
cma	-0.106**	-0.098*	-0.101*	-0.051	-0.154	-0.087
chin		0.019*	0.018*	0.016		0.010
emg		-0.072*	-0.057*	0.035		0.101*
SPBref			0.9524*			
SEBref				1.511		
Adj. R2	0.24	0.39	0.99	0.97	0.22	0.35

*Note:* The table shows results from explaining the monthly total return from the Stock Picking-activity with varying sets of explanatory variables.  $SPB_{excess}$  indicates excess monthly return of the Stock Picking-activity over its benchmark.  $SEB_{excess}$  indicates excess monthly return of the Stock Picking-activity over the Strategic Equity Benchmark.  $SP_{totret}$  indicates total monthly return of the Stock Picking-activity. SPBref is the monthly total return of the Stock Picking benchmark portfolio. SEBref is the monthly total return of the Strategic Equity benchmark portfolio. erm, hml, smb, rmw, cma are all prof. Kenneth French's international research factors and were collected from his website during March 2018. chin is the MSCI China A-shares net index in USD less the risk-free rate, emg is the MSCI Emerging Markets net index in USD less the risk-free rate. All returns are monthly and in USD. Estimation period covers the interval Jan 2013 – Dec 2018. \*, \*\* indicate statistical significance at 5% and 10 % levels of confidence, respectively. Standard errors are adjusted for serial correlation with Newey-West/Bartlett Window and 1 Lags, following Newey and West (1987).

Table 3

## Alternative Factor Models.

	Alpha
SPB 3F	0.027
SPB 3F+2	-0.003
SPB 4F	0.040
SPB 4F+2	0.008
SEB 3F	-0.135
SEB 3F+2	-0.087
SEB 4F	-0.131
SEB 4F+2	-0.089

*Note:* SPB indicates Stock Picking Benchmark. SEB indicates Strategic Equity Benchmark. The table shows the alpha-estimate from regressing the excess return of SPP over the indicated benchmark. 3F is the standard Fama French 3-factor model. 4F is this, compounded by Momentum (WML). “+2” means adding China and Emerging Markets. The table shows the alpha when explaining the excess monthly return of the SPP over the respective benchmarks with varying sets of explanatory variables. All other details are as specified for Table 2. None of the alphas are statistically significant.