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COVER

Ewa Grabowska

TECHNICAL ASSISTANT

Marcin Jakubiak

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Dom Wydawniczy ELIPSA,
ul. Inflancka 15/198, 00-189 Warszawa
tel./fax 22 635 03 01, 22 635 17 85,
e-mail: elipsa@elipsa.pl, www.elipsa.pl

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FROM THE SCIENTIFIC COUNCIL

Ladies and Gentlemen,

We present you with the eighth edition of the 'Journal of Management and Financial Sciences'. We hope that these articles will present a contribution to the development of economic thought and contribute to a fuller understanding of the complex economic issues. We wish you pleasant reading.

Janusz Ostaszewski,
Chairman of the Scientific Council and Dean of the Faculty

Ryszard Bartkowiak,
Vice-Chairman of the Scientific Council and Vice-Dean of the Faculty

Edward I. Altman
New York University Stern School of Business
Herbert Rijken
Vrije University*

Toward a Bottom-Up Approach to Assessing Sovereign Default Risk: An Update**

During the past four years, bank executives, government officials, and many others have been sharply criticized for failing to anticipate the global financial crisis. The speed and depth of the market declines shocked the public. Plus no one seemed more surprised than the credit rating agencies that assess the default risk of sovereign governments as well as corporate issuers operating within their borders.

Although the developed world had suffered numerous recessions in the past 150 years, this most recent international crisis raised grave doubts about the ability of major banks and even sovereign governments to honor their obligations. Several large financial institutions in the U.S. and Europe required massive state assistance to remain solvent, and venerable banks like Lehman Brothers even went bankrupt. The cost to the U.S. and other sovereign governments of rescuing financial institutions believed to pose “systemic” risk was so great as to result in a dramatic increase in their own borrowings.

The general public in the U.S. and Europe found these events particularly troubling because they had assumed that elected officials and regulators were well-informed about financial risks and capable of limiting serious threats to their investments, savings, and pensions. High-ranking officials, central bankers, financial regulators, ratings agencies, and senior bank executives all seemed to fail to sense the looming financial danger.

This failure seemed even more puzzling because it occurred years after the widespread adoption of advanced risk management tools. Banks and portfolio managers had long been using quantitative risk management tools such as Value at

* The authors would like to thank Dan Balan and Matthew Watt of RiskMetrics Group, a subsidiary of MSCI, Inc., for computational assistance, and Brenda Kuehne of the NYU Salomon Center for her research assistance.

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Risk (“VaR”). And they should also have benefited from the additional information about credit risk made publicly available by the new market for credit default swaps (“CDS”).

But, as financial market observers have pointed out, VaR calculations are no more reliable than the assumptions underlying them. Although such assumptions tend to be informed by statistical histories, critical variables such as price volatilities and correlations are far from constant and thus difficult to capture in a model. The market prices of options – or of CDS contracts, which have options “embedded” within them – can provide useful market estimates of volatility and risk. Also economists have found that CDS prices on certain kinds of debt securities increase substantially before financial crises become full-blown. But because there is so little time between the sharp increase in CDS prices and the subsequent crisis, policy makers and financial managers typically have little opportunity to change course¹.

The most popular tools for assessing sovereign risk are effectively forms of “top-down” analysis. For example, in evaluating particular sovereigns, most academic and professional analysts use macroeconomic indicators such as GDP growth, national debt-to-GDP ratios, and trade and budget deficits as gauges of a country’s economic strength and well-being. But, as the recent Euro debt crisis has made clear, such “macro” approaches, while useful in some settings and circumstances, have clear limitations.

In this paper, we present a totally new method for assessing sovereign risk, a type of “bottom-up” approach that focuses on the financial condition and profitability of an economy’s private sector. The assumption underlying this approach is that the fundamental source of national wealth, and of the financial health of sovereigns, is the economic output and productivity of their companies. To the extent we are correct, such an approach could provide financial professionals and policy makers with a more effective means of anticipating financial trouble, thereby enabling them to understand the sources of problems before they become unmanageable.

In the pages that follow, we introduce Z-Metrics™, as a practical and effective tool for estimating sovereign risk. Developed in collaboration with the Risk Metrics Group, now a subsidiary of MSCI, Inc., Z-Metrics is a logical extension of the Altman Z-Score technique that was introduced in 1968 and has since achieved considerable scholarly and commercial success. Of course, no method is infallible,

¹ See, for example, Hekran Neziri’s “Can Credit Default Swaps predict Financial Crises?” in the Spring 2009, „Journal of Applied Economic Sciences’, Vol. IV/Issue 1(7). Neziri found that CDS prices had real predictive power for equity markets, but that the lead time was generally on the order of one month.

or represents the best fit for all circumstances. But by focusing on the financial health of private enterprises in different countries, our system promises at the very least to provide a valuable complement to, or reality check on, standard “macro” approaches.

But before we delve into the details of Z-Metrics, we start by briefly reviewing the record of financial crises to provide some historical perspective. Next we attempt to summarize the main findings of the extensive academic and practitioner literature on sovereign risk, particularly those studies designed to test the predictability of sovereign defaults and crises.

With that as background, we then present our new Z-Metrics system for estimating the probability of default for individual (non-financial) companies and show how that system might have been used to anticipate many developments during the current EU debt crisis. In so doing, we make use of the most recent (2009 and 2010) publicly available corporate data for nine European countries, both to illustrate our model’s promise for assessing sovereign risk and to identify the scope of reforms that troubled governments must consider not only to qualify for bailouts and subsidies from other countries and international bodies, but to stimulate growth in their economies.

More specifically, we examine the effectiveness of calculating the median company five-year probability of default of the sovereign’s non-financial corporate sector, both as an absolute measure of corporate risk vulnerability and a relative health index comparison among a number of European sovereigns, including the U.S. as well. Our analysis shows that this health index, measured at periods prior to the explicit recognition of the crisis by market professionals, not only gave a distinct early warning of impending sovereign default in some cases, but also provided a sensible hierarchy of relative sovereign risk. We also show that, during the current European crisis, our measures not only compared favorably to standard sovereign risk measures, notably credit ratings, but performed well even when compared to the implied default rates built into market pricing indicators such as CDS spreads (while avoiding the well-known volatility of the latter).

Our aim here is not to present a “beauty contest” of different methods for assessing sovereign risk in which one method emerges as the clear winner. What we are suggesting is that a novel, bottom-up approach that emphasizes the financial condition and profitability of a nation’s private sector can be effectively combined with standard analytical techniques and market pricing to better understand and predict sovereign health. Our analysis also has one clear implication for policy makers: that the reforms now being contemplated should be designed, as far as possible, to preserve the efficiency and value of a nation’s private enterprises.

1. Modern History Sovereign Crises

When thinking about the most recent financial crisis, it is important to keep in mind how common sovereign debt crises have been during the last 150 years – and how frequently such debacles have afflicted developed economies as well as emerging market countries. Figure 1 shows a partial list of financial crises (identified by the first year of the crisis) that have occurred in “advanced” countries. Overall, Latin America seems to have had more recent bond and loan defaults than any other region of the world (as can be seen in Figure 2). However if we had included a number of now developed Asian countries among the “advanced” countries, the period 1997–1999 period would be much more prominent.

Figure 1. Financial Crises, Advanced Countries 1870–2010

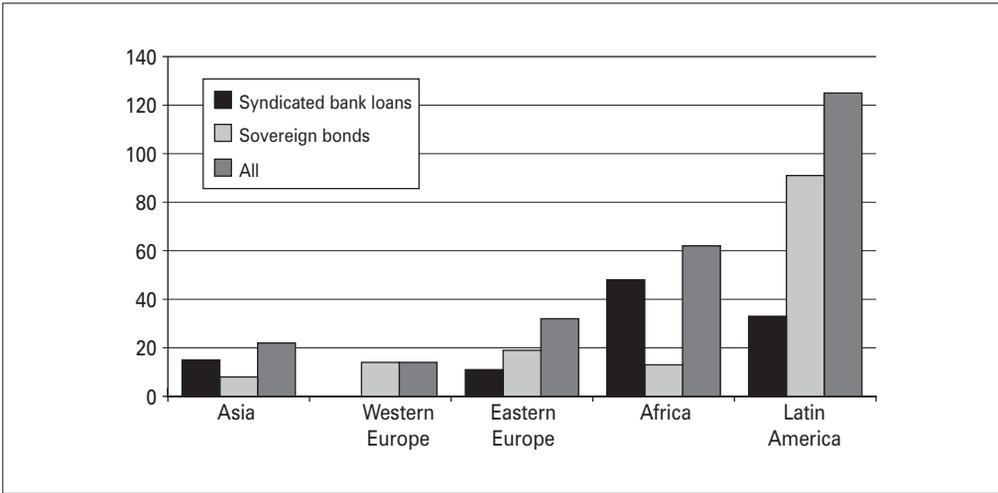
	Crisis events (first year)						
Austria	1893	1989					
Brazil	1898	1902	1914	1931	1939		
Canada	1873	1906	1923	1983			
Czechoslovakia	1870	1910	1931	2008			
China	1921	1939					
Denmark	1877	1885	1902	1907	1921	1931	1987
DEU	1880	1891	1901	1931	2008		
GBR	1890	1974	1984	1991	2007		
Greece	1870	1894	1932	2009			
Italy	1887	1891	1907	1931	1930	1935	1990
Japan	1942						
Netherlands	1897	1921	1939				
Norway	1899	1921	1931	1988			
Russia	1918	1998					
Spain	1920	1924	1931	1978	2008		
Sweden	1876	1897	1907	1922	1931	1991	
USA	1873	1884	1893	1907	1929	1984	2008

Source: IMF Global Financial Stability Report (2010), Reinhart and Rogoff (2010), and various other sources, such as S&P’s economic reports.

The clear lesson from Figures 1 and 2 is that sovereign economic conditions appear to spiral out of control with almost predictable regularity and then require massive debt restructurings and/or bailouts accompanied by painful austerity programs. Recent examples include several Latin American countries in the 1980s,

Southeast Asian nations in the late 1990s, Russia in 1998, and Argentina in 2000. In most of those cases, major problems originating in individual countries not only imposed hardships on their own people and markets, but had major financial consequences well beyond their borders. We are seeing such effects now as financial problems in Greece and other southern European countries not only affect their neighbors, but threaten the very existence of the European Union.

Figure 2. Number of Sovereign “Defaults” 1824–2004



Source: Compilation by Ingo Walter, NYU Stern School of Business.

Such financial crises have generally come as a surprise to most people, including even those specialists charged with rating the default risk of sovereigns and the enterprises operating in these suddenly threatened nations. For example, it was not long ago that the Greek debt was an investment grade, and Spain was rated Aaa as recently as June 2010². And this pattern has been seen many times before. To cite just one more case, South Korea was viewed in 1996 as an “Asian Tiger” with a decade-long record of remarkable growth and an AA-rating. Within a year however, the country was downgraded to BB-, a “junk” rating, and the country’s government avoided default only through a \$50 billion bailout by the IMF. And it was not just the rating agencies that were fooled; most of the economists at the brokerage houses also failed to see the problems looming in South Korea.

² On April 27, 2010, Standard & Poor’s Ratings Services lowered its long- and short-term credit ratings on the Hellenic Republic (Greece) to non-investment grade BB+; and on June 14, 2010, Moody’s downgraded Greece debt to Ba1 from A2 (4 notches), while Spain was still Aaa and Portugal was A1. Both of the latter were recently downgraded. S&P gave similar ratings.

2. What Do We Know about Predicting Sovereign Defaults?

There is a large and growing body of studies on the default probability of sovereigns, by practitioners as well as academics³. A large number of studies, starting with Frank and Cline's 1971 classic, have attempted to predict sovereign defaults or rescheduling using statistical classification and predicting methods like discriminant analysis as well as similar econometric techniques⁴. And in a more recent development, some credit analysts have begun using the "contingent claim" approach⁵ to measure, analyze, and manage sovereign risk based on Robert Merton's classic "structural" approach (1974). But because of its heavy reliance on market indicators, this approach to predicting sovereign risk and credit spreads has the drawback of producing large – and potentially self-fulfilling – swings in assessed risk that are attributable solely to market volatility.

A number of recent studies have sought to identify global or regional common risk factors that largely determine the level of sovereign risk in the world, or in a region such as Europe. Some studies have shown that changes in both the risk factor of individual sovereigns and in a common time-varying global factor affect the market's repricing of sovereign risk⁶. Other studies, however, suggest that sovereign credit spreads are more related to global aggregate market indexes, including U.S. stock and high-yield bond market indexes, and global capital flows than to their own local economic measures⁷. Such evidence has been used to justify an approach to quantifying sovereign risk that uses the local stock market index as a proxy for the equity value of the country⁸. Finally, several very recent papers focus on the importance of macro variables such as debt service

³ One excellent primer on sovereign risk is Babel's (1996) study, which includes an excellent annotated bibliography by S. Bertozzi on external debt capacity that describes many of these studies. Babel lists 69 potentially helpful explanatory factors for assessing sovereign risk, all dealing with either economic, financial, political, or social variables. Except for the political and social variables, all others are macroeconomic data and this has been the standard until the last few years. Other work worth citing include two practitioner reports – Chambers (1997) and Beers et al (2002) – and two academic studies – Smith and Walter (2003), and Frenkel, Karmann and Scholtens (2004). Full citations of all studies can be found in References section at the end of the article.

⁴ Including Grinols (1976), Sargen (1977), Feder and Just (1977), Feder, Just and Ross (1981), Cline (1983), Schmidt (1984), and Morgan (1986).

⁵ Gray, Merton and Bodie (2006, 2007).

⁶ See Baek, Bandopadhyaya and Chan (2005). Gerlach, Schulz and Wolff (2010) observe that aggregate risk factors drive banking and sovereign market risk spreads in the Euro area; and in a related finding, Sgherri and Zoli (2009) suggest that Euro area sovereign risk premium differentials tend to move together over time and are driven mainly by a common time-varying factor.

⁷ See Longstaff, Pan, Pedersen and Singleton (2007).

⁸ See Oshino and Saruwatari (2005).

relative to tax receipts and the volatility of trade deficits in explaining sovereign risk premiums and spreads⁹.

A number of studies have also attempted to evaluate the effectiveness of published credit ratings in predicting defaults and expected losses, with most concluding that sovereign ratings, especially in emerging markets, provide an improved understanding of country risks for investment analytics¹⁰. Nevertheless, the recent EU debt crisis would appear to contradict such findings by taking place at a time when all the rating agencies and, it would seem, all available models for estimating sovereign risk indicated that Greece and Spain – and others now recognized as high-risk countries – were still classified as an investment grade¹¹. What is more, although almost all of the studies cited above have been fairly optimistic about the ability of their concepts to provide early warnings of major financial problems, their findings have either been ignored or have proven ineffective in forecasting the most economic and financial crises.

In addition to these studies, a handful of researchers have taken a somewhat different “bottom-up” approach by emphasizing the health of the private sectors supporting the sovereigns. For example, a 1998 World Bank study of the 1997 East Asian crisis¹² used the average Z-Score of listed (non-financial) companies to assess

⁹ These include Haugh, Ollivaud and Turner’s (2009) discussion of debt service relative to tax receipts in the Euro area; Hilscher and Nobusch (2010) emphasis on the volatility of terms of trade; and Segoviano, Caceres and Guzzo’s (2010) analysis of debt sustainability and the management of a sovereign’s balance sheet.

¹⁰ For example, Remolona, Scatigna and Wu (2008) reach this conclusion after using sovereign credit ratings and historical default rates provided by rating agencies to construct a measure of ratings implied expected loss.

¹¹ To be fair, S&P in a Reuter’s article dated January 14, 2009 warned Greece, Spain and Ireland that their ratings could be downgraded further as economic conditions deteriorated. At that time, Greece was rated A1 by Moody’s and A- by S&P. Interestingly, it was almost a full year later on December 22, 2009 that Greece was actually downgraded by Moody’s to A2 (still highly rated), followed by further downgrades on April 23, 2010 (to A3) and finally to “junk” status (Ba1) on June 14, 2010. As noted earlier, S&P downgraded Greece to “junk” status about three months earlier.

¹² See Pomerleano (1998), which is based on a longer article by the author (1997). Taking a somewhat similar approach, many policy makers and theorists have recently focused on the so-called “shadow banking system.” For example, Gennaioli, Martin and Rossi (2010) argued that the financial strength of governments depends on private financial markets and its ability to attract foreign capital. They concluded that strong financial institutions not only attract more capital but their presence also helps encourage their governments to repay their debt. Chambers of S&P (1997) also mentions the idea of a “bottom-up” approach but not to the assessment of sovereign risk, but to a corporate issuer located in a particular country. He advocates first an evaluation of an issuer’s underlying creditworthiness to arrive at its credit rating and then considers the economic, business and social environment in which the entity operates. These latter factors, such as the size and growth and the volatility of the economy, exchange rates, inflation, regulatory environment, taxation, infrastructure and labor market conditions are factored in on top of the micro variables to arrive at a final rating of the issuer.

the “financial fragility” of eight Asian countries and, for comparison purposes, three developed countries and Latin America. Surprising many observers, the average Z-Score for South Korea at the end of 1996 suggested that it was the most financially vulnerable Asian country, followed by Thailand, Japan, and Indonesia. As noted earlier, Korea’s sovereign bond rating in 1996 was AA- (S&P). But within a year, Korea’s rating dropped to BB-; and if not for the IMF bailout of \$50 billion, the sovereign would almost certainly have defaulted on its external, non-local currency debt. A traditional macroeconomic measure like GDP growth would not have predicted such trouble since, at the end of 1996, South Korea had been growing at double-digit rates for nearly a decade¹³.

3. The Z-Metrics™ Approach¹⁴

In 2009, we partnered with the RiskMetrics Group with the aim, at least initially, of creating a new and better way of assessing the credit risk of *companies*. The result was our new Z-Metrics approach. This methodology might be called a new generation of the original Z-Score model of 1968. Our objective was to develop up-to-date credit scoring and the probability of default metrics for both large and small, public and private, enterprises on a global basis.

In building our models, we used multivariate logistic regressions and data from a large sample of both public and private U.S. and Canadian non-financial sector companies during the 20-year period 1989–2008¹⁵. We analyzed over 50 fundamental financial statement variables, including measures (with trends as well as point estimates) of solvency, leverage, size, profitability, interest coverage, liquidity, asset quality, investment, dividend payout, and financing results. In addition to such operating (or “fundamental”) variables, we also included equity market price and return variables and their patterns of volatility. Such market

¹³ Afterwards, the World Bank and other economists such as Paul Krugman concluded that that crony capitalism and the associated implicit public guarantees for politically influential enterprises coupled with poor banking regulation were responsible for the crisis. The excesses of corporate leverage and permissive banking were addressed successfully in the case of Korea and its economy was effectively restructured after the bailout.

¹⁴ For more details, see Altman, et al, 2010 “The Z-Metrics™ Methodology for Estimating Company Credit Ratings and Default Risk Probabilities”, RiskMetrics Group, continuously updated, available from <http://riskmetrics.com/Z-Metrics>.

¹⁵ Our first model’s original sample consisted of over 1,000 U.S. or Canadian non-financial firms that suffered a credit event and a control sample of thousands of firms that did not suffer a credit event, roughly a ratio of 1:15. After removing those firms with insufficient data, the credit event sample was reduced to 638 firms for our public firm sample and 802 observations for our private firm sample.

variables have typically been used in the “structural distance-to-default measures” that are at the core of the KMV model¹⁶ now owned by Moody’s.

In addition to these firm-specific, or micro, variables, we also tested a number of macro-economic variables that are often used to estimate sovereign default probabilities, including GDP growth, unemployment, credit spreads, and inflation. Since most companies have a higher probability of default during periods of economic stress – for example, at the end of 2008 – we wanted to use such macro variables to capture the heightened or lower probabilities associated with general economic conditions¹⁷.

The final model, which consists of 13 fundamental, market value, and macroeconomic variables, is used to produce a credit score for each public company. (Plus as discussed later, although our primary emphasis was on applying Z-Metrics to publicly traded companies, we also created a private firm model by using data from public companies and replacing market value with book value of equity.)

The next step was to use a logit specification of the model (described in the Appendix) that we used to convert the credit scores into probabilities of default (PDs) over both one-year and five-year horizons. The one-year model is based on data from financial statements and market data approximately one year prior to the credit event, and the five-year model includes up to five annual financial statements prior to the event.

To test the predictive power of the model and the resulting PDs, we segregated all the companies in our sample into “cohorts” according to whether they experienced “credit events” that included either formal default or bankruptcy (whichever came first). All companies that experienced a credit event within either one year or five years were assigned to the “distressed” or “credit event” group (with all others assigned to the non-distressed group).

Our test results show considerable success in predicting defaults across the entire credit spectrum from the lowest to the highest default risk categories. Where possible, we compared our output with that of publicly available credit ratings and existing models. The so-called “accuracy ratio” measures how well our model predicts which companies do or do not go bankrupt on the basis of data available before bankruptcy. The objective can be framed in two ways: (1) maximizing the correct predictions of defaulting and non-defaulting companies (which statisticians

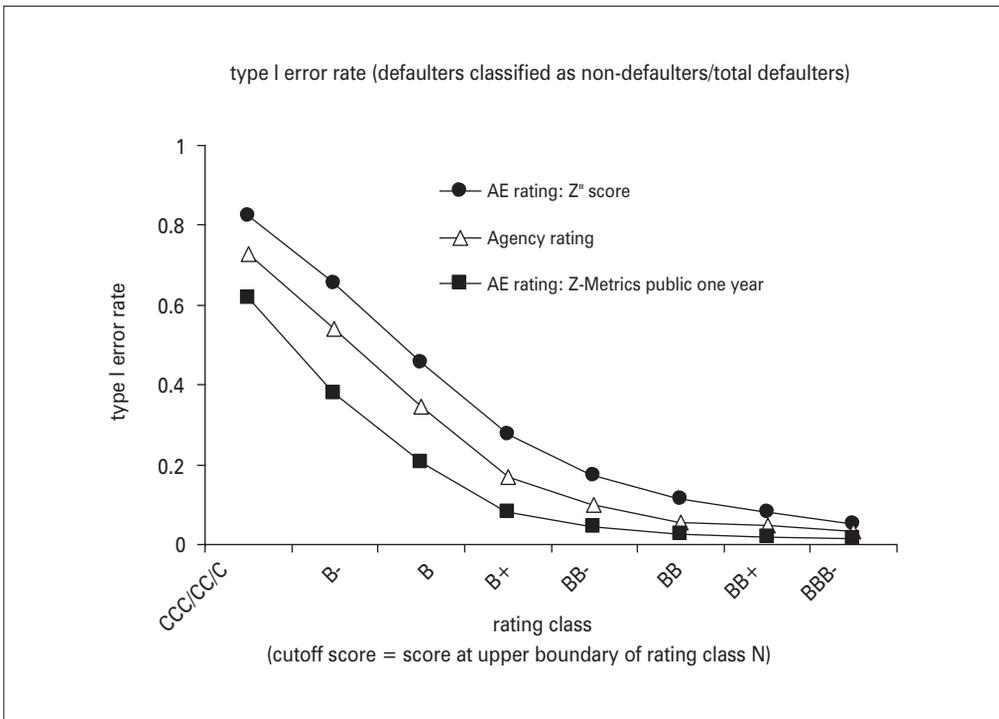
¹⁶ Developed by Crosbie in 1998 and adapted for sovereigns by Gray in 2007.

¹⁷ In all cases, we carefully examined the complete distribution of variable values, especially in the credit-event sample. This enabled us to devise transformations on the variables to either capture the nature of their distributions or to reduce the influence of outliers. These transformations included logarithmic functions, first differences and dummy variables if the trends or levels of the absolute measures were positive/negative.

refer to as Type I accuracy) and (2) minimizing wrong predictions (Type II accuracy).

As can be seen in Figure 3, our results, which include tests on actual defaults during the period 1989–2009, show much higher Type I accuracy levels for the Z-Metrics model than for either the bond rating agencies or established models (including an older version of Z-Scores). At the same time, our tests show equivalent Type II accuracies at all cutoff levels of scores¹⁸.

Figure 3. Type I error for Agency ratings, Z"-score, and Z-Metrics agency equivalent (AE ratings (1989–2008): one year prediction horizon for publicly owned firms



Perhaps the most reliable test of credit scoring models is how well they predict critical events based on samples of companies that were not used to build the model, particularly if the events took place after the period during which the model was built (after 2008, in this case). With that in mind, we tested the

¹⁸ We assessed the stability of the Z-Metrics models by observing the accuracy ratios for our tests in the in-sample and out-of-sample periods and also by observing the size, signs and significance of the coefficients for individual variables. The accuracy ratios were very similar between the two sample periods and the coefficients and significance tests were extremely close.

model against actual bankruptcies occurring in 2009, or what we refer to as our “out-of-sample” data. As with the full test sample results shown in Figure 3, our Z-Metrics results for the “out of sample” bankruptcies of 2009 outperformed the agency ratings and the 1968 Z-score and 1995 Z”-score models using both one-year and five-year horizons.

4. A “Bottom-Up” Approach for Sovereign Risk Assessment

Having established the predictive power of our updated Z-score methodology, our next step was to use that model (which, again, was created using large publicly traded U.S. companies) to evaluate the default risk of European companies. And after assuring ourselves that the model was transferable in that sense, we then attempted to assess the overall creditworthiness of sovereign governments by aggregating our Z-Metrics default probabilities for individual companies and then estimating both a median default probability and credit rating for different countries.

In conducting this experiment, we examined nine key European countries over three time periods, the end of 2008, 2009 and 2010 (Figure 4) and again at the end of 2010 (Figure 5), when the crisis was well known. People clearly recognized the crisis and concern for the viability of the European Union in June 2010, when Greece’s debt was downgraded to non-investment grade and both Spain and Portugal were also downgraded. Credit markets, particularly CDS markets, had already recognized the Greek and Irish problems before June 2010. Market prices during the first half of 2010 reflected high implied probabilities of default for Greece and Ireland, but were considerably less pessimistic in 2009. By contrast, as can be seen in Figure 4, which shows our Z-Metric median PD estimates alongside sovereign CDS spread over both periods¹⁹, our PD estimates were uniformly higher (more risky) in 2009 than early in 2010, even if the world was more focused on Europe’s problems in the latter year. In this sense, our Z metrics PD might be viewed as providing a leading indicator of possible distress. It should be noted that the statistics in Figure 4 report only on the non-financial private sector, while those in Figure 5 include results from our banking credit risk model, as well.

For the first four months of 2010, our Z-Metrics’ five-year PDs for European corporate default risk placed Greece (10.60%) and Portugal (9.36%) in the highest risk categories (ZC-ratings), followed by Italy (7.99%), Ireland (6.45%) and Spain (6.44%), all in the ZC category. Then came Germany and France (both about 5.5%

¹⁹ The median CDS spread is based on the daily observations in the six/four-month periods. The median Z-Metrics PD is based on the median company PDs each day and then we calculated the median for the period. The results are very similar to simply averaging the median PDs as of the beginning and ending of each sample period.

– ZC+), with the UK (3.62%) and the Netherlands (3.33%) at the lowest risk levels (ZB– and ZB). The USA looked comparatively strong, at 3.93% (ZB–).

For the most part, these results are consistent with how traditional analysts now rank sovereign risks. Nevertheless, there were a few surprises. The UK had a fairly healthy private sector, and Germany and France were perhaps not as healthy as one might have thought. The UK’s relatively strong showing might have resulted from the fact that our risk measure at this time did not include financial sector firms, which comprised about 35% of the market values of listed UK corporates and were in poor financial condition. And several very large, healthy multinational entities in the UK index might have skewed results a bit. The CDS/5-year market’s assessment of UK risk was harsher than that of our Z-Metrics index in 2010, with the median of the daily CDS spreads during the first four months implying a 6.52% probability of default, about double our Z-Metrics median level. Greece also had a much higher CDS implied PD at 24.10%, as compared to 10.60% for Z-Metrics. (And, of course, our choice of the *median* Z-Metrics PD is arbitrary, implying as it does, that fully 50% of the listed companies have PDs higher than 10.60%.)

We also observed that several countries had relatively high standard deviations of Z-Metrics PDs, indicating a longer tail of very risky companies. These countries included Ireland, Greece and, surprisingly, Germany, based on 2010 data. So, while almost everyone considers Germany to be the benchmark-low risk country in Europe (for example, its 5-year CDS spread was just 2.67% in 2010, even lower than the Netherlands (2.83%), we are more cautious based on our broad measure of private sector corporate health.

5. 2010 Results

Figure 5 shows the weighted-average median PDs for 11 (including now Sweden and Belgium) European countries and the U.S. as of the end of 2010. Note that we now are able to include PDs for the banking sectors (listed firms only) for these countries, an important addition, especially for countries like Greece, Ireland and the UK. The results show the large difference between Greece (16.45%) and all the rest, but also that the “big-five PIIGS” stand out as the clear higher risk domains. Indeed, we feel that Italy could be the “fulcrum” country to decide the ultimate fate of the Euro (noted in our “Insight” piece in the “Financial Times”, June 21, 2011).

6. CDS Implied PDs

Figure 6 shows the implied PDs for the “Big-Five” European high-risk countries from the start of 2009 to mid-July 2011, just after the European Union’s

comprehensive rescue plan was announced (July 21, 2011) for Greece and a contingent plan for other countries. Please note that while the PDs, based on CDS spreads and assuming a 40% recovery rate, all came down from their highs, all still imply a considerable default risk.

7. 2010 vs. 2009

As noted earlier from Figure 4, our PD estimates for 2009 were uniformly higher (more risky) than those for early 2010. One important reason for the higher PDs in 2009 is the significant impact of the stock market, which is a powerful variable in the Z-Metrics model – and in many other default probability models (notably, Moody’s KMV). Recall that the stock markets were at very low levels at the end of 2008 and into the early months of 2009, while there was a major recovery later in 2009 and in early 2010.

Figure 4. Financial Health of the Corporate, Non-Financial Sector: Selected European Countries and USA in 2008–2010

Z-Metrics PD Estimates: Five-Year Public Model					Five-Year Implied PD from CDS Spread*		
Country	Listed Companies	Y/E 2010 Median PD	Y/E 2009 Median PD	Y/E 2008 Median PD	2010	2009	2008
		(in %)					
Netherlands	85	3.56	3.33	5.62	2.03	2.83	6.06
USA	2226	3.65	3.93	6.97	3.79	3.28	4.47
Sweden	245	3.71	5.31	6.74	2.25	4.60	6.33
Ireland	29	3.72	6.45	7.46	41.44	12.20	17.00
Belgium	69	3.85	5.90	5.89	11.12	4.58	5.53
UK	507	4.28	3.62	5.75	4.73	6.52	8.13
France	351	4.36	5.51	7.22	4.51	3.75	4.05
Germany	348	4.63	5.54	7.34	2.50	2.67	3.66
Italy	174	7.29	7.99	10.51	9.16	8.69	11.20
Spain	91	7.39	6.44	7.39	14.80	9.39	8.07
Portugal	33	10.67	9.36	12.07	41.00	10.90	7.39
Greece	93	15.28	10.60	11.57	70.66	24.10	13.22

* Assuming a 40% recovery rate (R); based on the median CDS spread (s). PD computed as $1 - e^{(-5*s/(1 - R))}$.

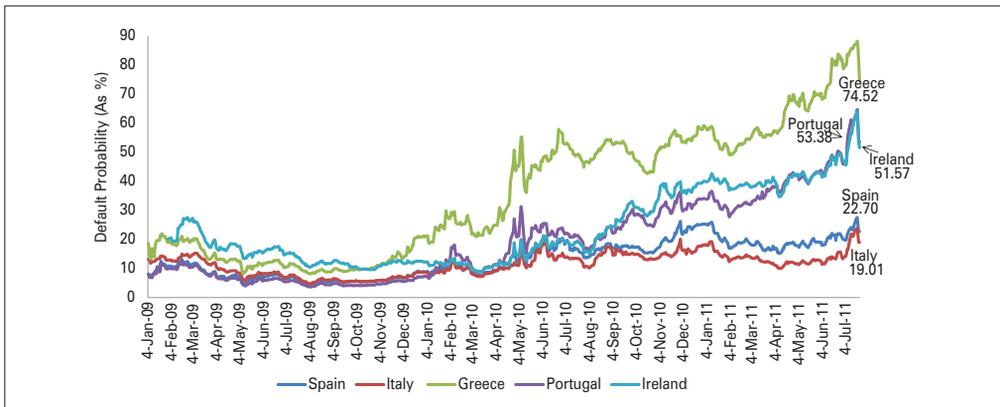
Sources: RiskMetrics Group (MSCI), Markit, Compustat.

Figure 5. Weighted Average Median Five-Year (PD) for Listed Non-Financial* and Banking Firms (Europe and U.S.), 2010**

Country	Non-Financial Firms		Banking Firms		Weighted Average (%)	Rank	CDS Spread PD (%)***	Rank
	PD (%)	Weight	PD (%)	Weight				
Netherlands	3.56	0.977	11.1	0.023	3.73	1	2.03	1
Sweden	3.71	0.984	17.3	0.016	3.93	2	2.25	2
Belgium	3.85	0.972	12.4	0.028	4.21	3	11.12	8
France	4.36	0.986	14.0	0.014	4.49	4	4.51	5
UK	4.28	0.977	15.5	0.023	4.54	5	4.73	6
Germany	4.63	0.983	13.1	0.017	4.77	6	2.50	3
USA	3.65	0.837	13.8	0.163	5.30	7	3.79	4
Spain	7.39	0.948	10.9	0.052	7.57	8	14.80	9
Italy	7.29	0.906	20.0	0.094	8.48	9	9.16	7
Ireland	3.72	0.906	77.6	0.094	10.65	10	41.44	11
Portugal	10.67	0.971	12.1	0.029	10.71	11	41.00	10
Greece	15.28	0.921	30.1	0.079	16.45	12	70.66	12

* Based on the Z-Metrics Probability Model. ** Based on Altman-Rijken Model (Preliminary). *** PD based on the CDS Spread as of 4/26/11.

Figure 6. Five-Year Implied Probabilities of Default (PD)* from Capital Market CDS Spreads, Jan 2009 – Jul 2011**



* Assumes 40% Recovery Rate. PD computed as $1 - e^{-5*s*(1-R)}$. ** On July 19, 2011, PDs for all countries peaked as follows: Greece 88.22, Portugal 64.74, Ireland 64.23, Spain 27.54, and Italy 23.74.

Sources: Bloomberg and NYU Salomon Center.

Figure 7 shows, for each of our nine European countries and the U.S., the percentage increases in median stock market index levels and sovereign PD levels between the first six months of 2009 and the first six months of 2010. As can be seen in the figure, most countries enjoyed increases of greater than 20%. Only Greece had a relatively low increase (5.5%), consistent with its modest improvement in its Z-Metrics PD (-8.4%). Figure 6 shows the percentage improvement (lower risk) in sovereigns' PDs in 2010, which are largely consistent with the increases in stock market index values. Note that Ireland stands out in that while its stock market index value increased by 26.2%, its corporate sector experienced only a modest improvement (-7.4%) in its Z-Metrics' median PD. This may be attributable to the earlier austerity measures taken in Ireland, as compared to those in other distressed European nations. But more likely the most important were changes in the many other variables in the Z-Metrics model that are not affected by stock prices, particularly the fundamental measures of corporate health.

Figure 7. Median Percentage Change in Various Country Stock Market Index Values and Z-Metrics' PDs Between the First Six Months of 2010 vs. 2009

Country	Index	Median Percent	Median Z-Metrics Percent
		Change (2010 vs. 2009)*	Change (2010 vs. 2009)
France	CAC40	24.1	-23.6
Germany	DAX	31.8	-24.5
Greece	ASE	5.5	-8.4
Ireland	ISEQ	26.2	-7.4
Italy	FTSEMIB	18.2	-24.0
Netherlands	AEX	34.4	-25.3
Portugal	PSI-20	17.8	-22.4
Spain	IBEX35	20.9	-12.9
UK	FTSE100	27.8	-37.6
USA	S&P500	31.9	-43.6

* Median of the various trading day stock index values and PDs, first six months of 2009 vs. First six months of 2010.

Sources: Z-Metrics Model calculations from RiskMetrics (MSCI) Group, Bloomberg for stock index values.

8. Comparing PD Results Based on Privately Owned vs. Publicly Owned Firm Models

As shown in Figures 4 and 5, the improvement (reduction) in Z-Metrics PDs for most countries in 2010 – a period in which most EU sovereigns appeared to be getting riskier – looks attributable in large part to the stock market increases in

almost all countries. But to the extent such increases could conceal a deterioration of a sovereign's credit condition, some credit analysts might prefer to have PD estimates that do not make use of stock market data.

With this in mind, we applied our private firm Z-Metrics model to evaluate the same nine European countries and the U.S. The private and public firm models are the same except for the substitution of equity book values (and volatility of book values) for market values. This adjustment is expected to remove the capital market influence from our credit risk measure.

Figure 8. Private Vs. Public Firm Model PDs in 2010 and 2009

Country	No. Listed Companies		Public-Firm Z-Metrics Model			Private-Firm Z-Metrics Model		
	2010	2009	PDs	PDs	Delta*	PDs	PDs	Delta*
			2010	2009		2010	2009	
(in %)								
Netherlands	61	60	3.33	5.62	-2.29	5.25	6.00	-0.75
UK	442	433	3.62	5.75	-2.13	6.48	5.97	+0.49
USA	2226	2171	3.93	6.97	-3.04	4.28	4.80	-0.52
France	297	294	5.51	7.22	-1.71	7.33	7.19	+0.14
Germany	289	286	5.54	7.34	-1.80	6.29	7.56	-1.27
Spain	82	78	6.44	7.39	-0.95	8.06	9.32	-1.26
Ireland	28	26	6.45	7.46	-1.01	6.31	6.36	-0.05
Italy	155	154	7.99	10.51	-2.52	8.14	9.07	-0.89
Portugal	30	30	9.36	12.07	-2.71	8.73	9.62	-0.89
Greece	79	77	10.60	11.57	-0.97	11.03	13.93	-2.90
Average			6.28	8.19	-1.91	7.19	7.98	-0.79

* Negative sign means improved credit risk.

Sources: Figure 4 and Riskmetrics (MSCI).

Figure 8 summarizes the results of our public vs. private firm Z-Metrics models comparative PD (delta) results for 2010 and 2009. For eight of the ten countries, use of the private firm model showed smaller reductions in PDs when moving from 2009 to 2010 than use of the public model. Whereas the overall average improvement in PDs for the public firm model was a drop of 1.91 percentage points, the drop was 0.79% for our private firm model. These results are largely the effect of the positive stock market performance in late 2009 and into 2010. However improvements in general macro conditions, along with their effects on traditional corporate performance measures, also helped improve (reduce) the PDs. Moreover, in two of these eight countries – the UK and

France – not only did the public firm model show an improved (lower) PD, but the private firm model's PD actually got worse (increased) in 2010 (as indicated by the positive delta in the last column of Figure 8).

9. Correlation of Sovereign PDs: Recent Evidence on Z-Metrics vs. Implied CDS PDs

As a final test of the predictive of our approach, we compared our Z-Metrics five-year median PDs for our sample of nine European countries (both on a contemporary basis and for 2009) with the PDs implied by CDS spreads in 2010. The contemporary PD correlation during the first third of 2010 was remarkably high, with an R^2 of 0.82. This was a period when it was becoming quite evident that certain European countries were in serious financial trouble and the likelihood of default was not trivial. But if we go back to the first half of 2009, the correlation drops to an R^2 of 0.36 (although it would be considerably higher, at 0.62, if we excluded the case of Ireland). Ireland's CDS implied PD was considerably higher in 2009 than 2010 (17.0% vs. 12.0%), while the Z-Metrics PD was relatively stable in the two years (7.5% and 6.5% respectively)²⁰. In 2010, whether we calculate the correlation with or without Ireland, the results are essentially the same (0.82 and 0.83).

Given the predictive success of Z-metrics in the tests already described, we were curious to find out whether it could be used to predict capital market (i.e., CDS) prices. So, we regressed our public firm model's 2009 Z-Metrics median, non-financial sector PDs against implied CDS PDs one year later in 2010. Admittedly, this sample was quite small (10 countries) and the analysis is for only a single time-series comparison (2009 vs. 2010). Nevertheless, these two years spanned a crucial and highly visible sovereign debt crisis, whereas the PDs implied by prior years' Z-Metrics and CDS showed remarkably little volatility²¹.

As can be seen in Figure 9, the correlation between our Z-Metrics PDs and those implied by CDS one year later proved to be remarkably strong, with an r of 0.69 and R^2 of 0.48. In sum, the corporate health index for our European countries (plus the U.S.) in 2009 explained roughly half of the variation in the CDS results one year later²².

²⁰ No doubt the CDS market was reacting quite strongly to the severe problems in the Irish banking sector in 2009, while Z-Metrics PDs were not impacted by the banks. This implies a potential strength of the CDS measure, although the lower CDS implied PD in early 2010 was not impressive in predicting the renewed problems of Irish banks and its economy in the fall of 2010.

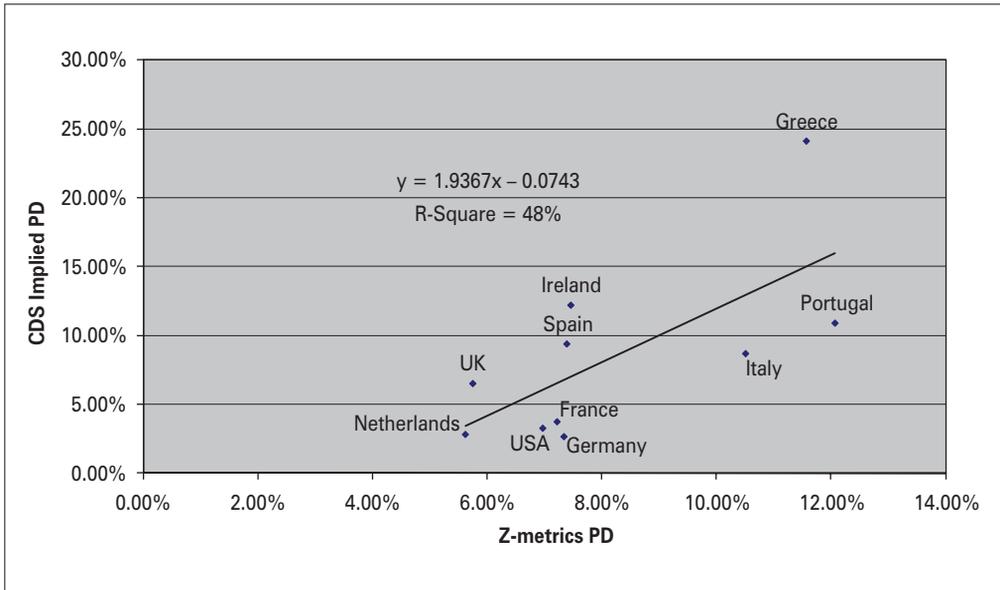
²¹ The last time an entire region and its many countries had a sovereign debt crisis was in Asia in 1997–1998. Unfortunately, CDS prices were not prominent and the CDS market was illiquid at that time.

²² Several other non-linear structures (i.e., power and exponential functions) for our 2009 Z-Metrics vs. 2010 CDS implied PDs showed similar results. In all cases, we are assuming a recovery rate of 40% on defaults in calculation of implied sovereign PDs.

A potential shortcoming of our approach is that we are limited in our private sector corporate health assessments to data from listed, publicly held firms. This is especially true for relatively small countries like Ireland (with just 28 listed companies), Portugal (with 30), Greece (79), Netherlands (61), and Spain (82). Since the private, non-listed segment is much larger in all of the countries, we are not clearly assessing the health of the vast majority of its firms and our sovereign health index measure is incomplete²³.

But if the size of the listed firm population is clearly a limitation in our calculations, there does not seem to be a systematic bias in our results. To be sure, the very small listings in Ireland, Portugal, and Greece appear heavily correlated with their high PDs, but the country with the lowest PD (the Netherlands) also has a very small listed population. Another potentially important factor is that the listed population in countries like the UK and the Netherlands is represented quite heavily by multinational corporations that derive most of their income from outside their borders²⁴.

Figure 9. 2009 Z-metrics PD vs. 2010 CDS Implied PD



²³ We suggest that complete firm financial statement repositories, such as those that usually are available in the sovereign's central bank be used to monitor the performance of the entire private sector.

²⁴ Results showing the percentage of "home-grown" revenues for listed firms across our European country sample were inclusive, however, as to their influence on relative PDs.

10. Conclusion and Implications

As the price for bailing out distressed sovereigns, today's foreign creditors, especially the stronger European nations, are demanding a heavy dose of austerity. Several governments, including those of Greece, Ireland, Spain, Portugal, Italy, and the UK, have already enacted some painful measures. Others, such as France and Hungary, have either resisted austerity measures or faced significant social unrest when austerity measures have been proposed. These measures typically involve substantial cuts in cash benefits paid to public workers, increases in retirement age, and other reduced infrastructure costs, as well as increased taxes for companies and individuals. The objective is to reduce deficits relative to GDP and enhance the sovereigns' ability to repay their foreign debt and balance their budgets.

While recognizing the necessity of requiring difficult changes for governments to qualify for bailouts and subsidies, we caution that such measures should be designed to inflict as little damage as possible on the health and productivity of the private enterprises that ultimately fund the sovereign. The goal should be to enable all private enterprises with clear going concern value to pay their bills, expand (or at least maintain) their workforces, and return value to their shareholders and creditors (while those businesses that show no promise of ever making a profit should be either reorganized or liquidated). For this reason, raising taxes and imposing other burdens on corporate entities is likely to weaken the long-run financial condition of sovereigns.

To better estimate sovereigns' risk of default, we propose that traditional measures of macroeconomic performance be combined with more modern techniques, such as the contingent claims analysis pioneered by Robert Merton and the bottom-up approach presented in these pages. Along with the intuitive appeal of such an approach and our encouraging empirical results, the probabilities of sovereign default provided by aggregating our Z-Metrics across a national economy can be seen, at the very least, as a useful complement to existing methods and market indicators – one that is not subject to government manipulation of publicly released statistics. Using our approach, the credit and regulatory communities could track the performance of publicly held companies and the economies in which they reside – and by making some adjustments, unlisted entities as well. And if sovereigns were also willing to provide independently audited statistics on a regular basis, so much the better.

APPENDIX: Logit Model Estimation of Default Probabilities

We estimated our credit scoring model based on a standard logit-regression functional form whereby:

$$CS_{i,t} = \alpha + \sum B_j X_{i,t} + \varepsilon_{i,t} \quad (1)$$

$CS_{i,t}$ = Z-Metrics credit score of company i at time t

B_j = variable parameters (or weights)

$X_{i,t}$ = set of fundamental, market based and macroeconomic variables for firm i quarter observations

$\varepsilon_{i,t}$ = error terms (assumed to be identically and independently distributed)

$CS_{i,t}$ is transformed into a probability of default by $PD_{i,t} = \frac{1}{1 + \exp(-CS_{i,t})}$

- We compare Z-Metrics results with issuer ratings. To ensure a fair comparison, credit scores are converted to agency equivalent (AE) ratings by ranking credit scores and by matching exactly the actual Agency rating distribution with the AE rating distribution at any point in time.
- We also compare our Z-Metrics results to the well established Altman Z"-score (1995) model²⁵.

²⁵ Altman's original Z-score model (1968) is well-known to practitioners and scholars alike. It was built, however, over 40 years ago and is primarily applicable to publicly-held manufacturing firms. A more generally applicable Z"-score variation was popularized later (Altman, Hartzell and Peck, 1995) as a means to assess the default risk of non-manufacturers as well as manufacturers, and was first applied to emerging market credits. Both models are discussed in Altman and Hotchkiss (2006) and will be compared in several tests to our new Z-Metrics model. Further, the Altman Z-score models do not translate easily into a probability of default rating system, as does the Z-Metrics system. Of course, entities that do not have access to the newer Z-Metrics system can still use the classic Z-score frameworks, although accuracy levels will not be as high and firm PDs not as readily available.

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Methods of Increasing Bank Capital Effectiveness – part 2

1. Introduction

The present study continues the author's deliberations on commercial bank capital management. These deliberations are included in the series of three closely related articles. The first section¹ is devoted to the presentation of the idea and classification of bank capitals. The second section refers to the modern effectiveness measures based on bank capitals. The last, fourth section is devoted to the practical aspects of the considerations presented before and includes the summary of the whole tripartite publication.

One of the basic tools measuring effectiveness is the measure of profitability ratio. The broadly understood profitability determines the relation between effects and outlays; it is said to be a measure of management effectiveness, undertaken actions, conducted activities etc.:

$$\text{Profitability} = \frac{\text{Effect}}{\text{Outlay}}$$

In the world of finance profitability includes the relation between the effect expressed primarily in the form of effect (profit/loss) and outlay expressed by the invested capital or assets: capital profitability (ROC – *Return on Capital*):

$$\text{Capital Profitability} = \frac{\text{Profit}}{\text{Capital}}$$

Limiting the deliberation to the profitability of total capitals, own capitals, third-party capitals and fixed capitals (i.e. typical balance elements) but remembering the discussion from the first section of the present article, such capitals should be mentioned as the capital in the form of total capital

¹ See: T. Cicirko, Methods of increasing bank capital effectiveness – part 1, „Journal of Management and Financial Sciences”, Volume II, SGH, October 2009.

requirement, the capital in the form of own regulatory funds, economic capital or internal capital. Thus, we can speak about profitability with reference to:

a) own capitals (ROE – return on equity):

$$\text{ROE} = \frac{\text{Profit}}{\text{Equity}}$$

or

b) regulatory capitals (total capital requirement) (RORC – return on regulatory capital):

$$\text{RORC} = \frac{\text{Profit}}{\text{Regulatory Capital}}$$

The replacement of RC in the denominator with the internal capital (IC) creates another measure in the following form (*ROIC – return on internal capital*):

$$\text{ROIC} = \frac{\text{Result}}{\text{Internal Capital}}$$

The profitability ratios RORC and ROIC, for the same reasons as ROA, can be calculated based on the gross result:

$$\text{ROIC}_{\text{Gross}} = \frac{\text{Result}}{\text{Internal capital}} \quad \text{ROIC}_{\text{Gross}} = \frac{\text{Result}}{\text{Internal Capital}}$$

From the perspective of available capital effectiveness management, it is interesting to consider a ratio whose denominator is based on own regulatory equity (*RORE – return on regulatory equity*). The ratio calculation formula looks as follows:

$$\text{RORE} = \frac{\text{Result}}{\text{Own regulatory equity}}$$

The combination of this ratio with RORC, on the one hand, informs about the loss opportunities and on the other about the “capital security margin”. The larger the difference between RORC and RORE, the higher is the value of unused capital, which instead of generating profit incurs costs connected with its possession. Furthermore, the higher difference translates into a better solvency ratio.

The controversies concerning the denominator of profitability ratios indicated in the preceding section of the study also refer RORC, ROIC or RORE, but only in the area concerning the moment from which the values used for calculation are derived.

The following relations between ROE, RORC and ROIC² may be inferred:

$$ROE = RORC \times \frac{\text{Regulatory capital}}{\text{Own capital}} \quad ROE = ROIR \times \frac{\text{Internal capital}}{\text{Own capital}}$$

Similar relations may be inferred between ROA, RORC and ROIC:

$$ROA = RORC \times \frac{\text{Regulatory capital}}{\text{Assets}} \quad ROA = ROIR \times \frac{\text{International capital}}{\text{Assets}}$$

The directly proportional relation between ROE/ROA and RORC or ROIC is the reason why the bank, wishing to generate the expected value of own capitals/assets, should implement the policy of maximising the effectiveness of both regulatory and internal capital.

Taking into account the results of the deliberations concerning bank capitals³, their most important types are: own capitals, regulatory capitals in the form of total capital requirements, own regulatory equity, economic capital and internal capital. These capital categories may be used in the RAPM (*Risk Adjusted Performance Measurement*) model, i.e. in the integrated tool of profitability measurement considering the risk value. Unlike the profitability based on the regulatory capital, RAPM allows for a considerably more precise way of the risk capital covering of business transactions. The RAPM model is based on the risk capital called economic or internal capital. For example, the model of the standard calculation of regulatory capital uses the mandatory risk weights⁴, whereas for the purposes of RAPM these weights are set individually, for example, for every customer. Thus, in the regulatory capital model the risk weight for the entities without any awarded rating, it amounts to 100% (irrespective of the fact whether it is a large entity like “PKN Orlen S.A.” or an unknown “Fly-By-Night” firm), whereas in the models based on economic capital, the weights for both entities may be diametrically different.

² Own materials.

³ See: Methods of Increasing Bank Capital Effectiveness – part 1.

⁴ Cf. Ch. Matten Zarządzanie kapitałem bankowym – alokacja kapitału i pomiar wyników (Bank capital management-capital allocation and measurement), Dom Wydawniczy ABC, Warszawa 2000, p. 74.

The broadest concept of RAPM also includes the basic regulatory capital profitability ratio:

1. RORC (*return on regulatory capital*)

$$\text{Regulatory capital profitability} = \frac{\text{Result}}{\text{Regulatory capital}}$$

2. RORAC (*return on risk adjusted capital*):

$$\text{Risk adjusted capital profitability} = \frac{\text{Result}}{\text{Risk adjusted capital (RAC)}}$$

3. RARORC (*risk adjusted return on capital*)

$$\text{Risk adjusted regulatory capital profitability} = \frac{\text{Result} - \text{Risk cost}}{\text{Regulatory capital}}$$

4. RARORAC (*risk adjusted return on risk adjusted capital*)

$$\text{Risk adjusted profitability of risk adjusted capitals} = \frac{\text{Result} - \text{Risk cost}}{\text{Risk adjusted capital (RAC)}}$$

The list of ratios has not been exhausted. The literature includes different acronyms or the same acronyms of different meaning.

Every ratio considers risk. However, the key role in the RAPM concept is played by the measures based on risk adjusted capital. The calculation of the risk value (in other words risk adjusted value) is nothing else but the calculation of capital to cover risk by means of the VaR method. The considerations in the first section⁵ indicate that the economic capital is included in the group of risk adjusted capital. Thus, the profitability ratios based on RAC include profitabilities calculated on the basis of economic capital, e.g. ROEC.

The actual difference between RORAC and RARORC is displayed in the approach to risk. In both measures the initial construction of the RORC ratio is risk adjusted, considered either in the numerator or denominator. The adjustment of the numerator by the risk costs means the reduction of effects by the standard risk costs (expected loss, EL), set as a derivative of historical loan default. The

⁵ See: T. Cicirko: Methods of increasing bank capital effectiveness – part 1, Journal of Management and Financial Sciences, Volume II, SGH, October 2009.

expected loss is hardly identified with pure risk because it constitutes cost (created reserve), and on the scale of the whole bank is calculated in the net profit. The adjustment of the denominator consists in the replacement of statistical risk capital in the form of regulatory capital with the capital indispensable to cover unexpected losses which are not secured by the created reserves. The total measure combining the risk adjustment of the numerator and denominator is the RARORAC ratio.

2. Economic profit

At the end of the 19th century Alfred Marshall formulated and described the idea of the innovation value measurement known at present as the residual income. There are some opinions claiming that the roots of the concept of the residual income date back to a more distant past. It may also be found in the accomplishments of D. Ricardo (mid-19th century) or R. Hamilton (the end of the 18th century)⁶. The works of A. Marshall make profitability measurement precise through the calculation of costs of lost opportunities. He indicated that the accounting profit did not consider the effects of alternative investments being the measure of the cost of lost opportunities. He suggested the replacement of the accounting profit with the residual income, whose general form may be presented as follows:

$$\text{residual income} = \text{profit} - (\text{capital cost} \times \text{capital})$$

The practical application of the idea of residual income took effect in the 1920's by General Motors, by Matsushita Electric (in the 30's) or General Electric (in the 50's)⁷. The development of the concept of residual income is the present measure in the form of economic profit (EP) and economic value added (EVA).

The economic profit is the difference between sales income and total economic costs. The economic costs include explicit (accounting) costs and implicit (invested capital costs). Sales income reduced by accounting costs (including interest of the third-party capital and income tax) create the category of net income, and after the adjustment by the implicit costs the economic profit is obtained⁸. The cost of capital is most often identified with the cost of own capital, i.e. the product of equity and the estimated rate of its interest.

⁶ B. Scarlett, Value Based Management, CIMA 1997, p. 12 and G. C. Biddle, R. M. Bowen, J. S. Wallace, Evidence on EVA, <http://ssrn.com>, p. 2.

⁷ S. D. Young, Some reflections on accounting adjustments and economic value added, „Journal of Financial Statement Analysis”, 1999, Vol. IV, No. 2, p. 7.

⁸ Economic profit is similarly described by J. M. McTaggart, P. W. Kontes, M. C. Mankins, The value imperative. Managing for superior shareholder returns, The Free Press, Nowy Jork 1994.

$$EP = Z_N - (E \times CoE)$$

where:

EP – economic profit,

Z_N – net profit,

E – equity,

CoE – cost of equity.

The calculation formula of economic profit may be modified to the following form:

$$EP = Z_B - (E \times CoE) - T$$

where:

EP – economic profit,

Z_B – gross profit,

E – equity,

CoE – cost of equity,

T – calculated income tax (CIT).

If the gross profit includes the interest paid on the subordinated loans, which belong to the equity, the effect should be raised by their value or adjust the capital costs. The calculation of the net profit is made through on of the following methods:

$$EP = Z_B + O_{PP} - (E \times CoE) - T$$

or

$$EP = Z_B - [(E - PP) \times CoE_{PP}] - T$$

where:

EP – economic profit,

Z_B – gross profit,

O_{PP} – interest on subordinated loans,

E – equity,

CoE – cost of equity,

T – calculated income tax CIT,

PP – subordinated loans value,

CoE_{PP} – the cost of equity adjusted by the cost of subordinated loans.

The economic profit may be calculated at the bank level, which is illustrated by the aforementioned calculation formulae, and at a lower level, e.g. for individual business areas: business lines, organisational entities or even products). In such a case, the information on the level of equity in the given area is required.

$$EP_{BANK} = \sum_{i=1}^n EP_{ODi}$$

$$EP_{ODi} = \sum_{i=1}^n [Z_{BODi} - (E_{ODi} \times CoE) - T_{ODi}]$$

where:

EP_{BANK} – bank economic profit,

EP_{ODi} – economic profit from an “i” area of bank operation,

Z_{BODi} – gross profit from an “i” area of operation,

E_{ODi} – equity allocated in an “i” area of operation,

T_{ODi} – calculated income tax CIT referring to an “i” area of operation.

An alternative solution is to calculate the gross economic profit (EP_{gross}), where tax issues are not considered and the calculations are made exclusively on the basis of gross profit. This simplification is recommendable in particular in the EP calculation for different operation areas due to possible problems and distortions resulting from the allocation of income tax from the bank level to its lower levels.

The calculation of the economic profit considering the risk costs in the form of the so-called standard risk costs (expected loss) is an interesting modification. The net profit includes the risk costs in the form of created reserves. The effect adjustment through the replacement of the created standard reserves with the risk costs (expected losses due to the transaction – EL) allows for the information on the possible risk adjusted possible EP level.

$$EP = Z_B - (E \times CoE) - T + R - K_R$$

where:

EP – economic profit,

Z_B – gross profit,

E – equity,

CoE – cost of equity,

T – calculated income tax CIT,

R – created reserves due to the concluded transactions,

K_R – risk costs due to the concluded transactions.

3. Economic value added

The example of the classical approach to the residual income is the economic profit. However, the modern finance school defines in detail both the return on capital and the capital itself, which as a result contributes to the new measure of the residual income in the form of the economic value added (EVA). At present, it is the most popular measure within the residual income concepts. It allows for the integration of the process of evaluation with the measurement of operation effects, which consequently unifies the decisions made within these two areas. EVA, measuring the invested capital, considers both own and third-party capital. The measurement of the return on capital uses the income before the repayment of interest (on principal) but after tax; this profit is called the net operating profit after tax (NOPAT). The economic profit includes the cost of the third-party capital cost in the form of the component reducing the effect in the course of its calculation. EVA treats this cost as an element of charge for the invested capital. The cost of the third-party capital is not separated but constitutes a component of the weighted average cost of capital (WACC)⁹.

The basic calculation formula EVA is as follows:

$$EVA = NOPAT - (C \times CoC)$$

where:

EVA – economic value added,

NOPAT – net operating profit after tax, i.e. profit before the deduction of costs of the third-party financing capitals but after the deduction of depreciation as well as reduced by tax expressed in terms of cash. This profit category is sensitive only to operating impulses, absolutely insensitive to the impact of factors related to financing¹⁰,

⁹ More on EVA and MVA in: M. Marcinkowska, *Kształtowanie Wartości Firmy (Corporate value creation)*, Wydawnictwo Naukowe PWN, Warsaw 2000; R. Myers, *Metric wars, CFO, The Magazine for Senior Financial Executives*, Vol. 12 iss. 10 October 1996; A. R. Shapiro, *Measuring Innovation: Beyond Revenue From New Products, "Research-Technology Management"* November–December 2006, Industrial Research Institute; Chikashi Tsuji, *Does EVA beat earnings and cash flow in Japan?*, "Applied Financial Economics", Nr 16, Faculty of Business Administration at Ritsumeikan University, Kusatsu-city 2006; E. Knap, *Wykorzystanie MVA i EVA w procesie tworzenia wartości (Application of MVA and EVA in the process of value creation)*, in: *Zarządzanie wartością firmy w dobie kryzysu (Corporate value management in the period of crisis)*, S. Kasiewicz, L. Pawłowicz (ed.), CeDeWu, Warsaw 2003.

¹⁰ A. Cwynar, W. Cwynar, *Zarządzanie wartością spółki kapitałowej – koncepcje, narzędzia, systemy (Capital company value management – concepts, tools systems)*, Fundacja Rozwoju Rachunkowości w Polsce, Warsaw 2002, p. 108.

C – invested capital (own and third-party); it is the sum of equity and all liabilities connected with the of capital providers' requirements concerning the return rate to be obtained. This capital is to be an approximated sum of cash brought into the company so far by investors; therefore its estimates include both equivalents of equity (reserves or research and development expenditure) and debt equivalents (operating leasing), expressing it in the economic accounting value (the so-called adjusted accounting value)¹¹,

CoC – cost of invested capital – e.g. average weighted cost of capital (WACC).

The economic value added is created only when the profitability of the invested capital exceeds the cost of its acquisition (WACC).

In the case of non-financial entities (manufacturing, commercial or service activities) the calculation of the NOPAT value seems to be uncomplicated. The category of the operating profit appearing in the profit and loss account nearly perfectly reflects the result of their statutory activity. It should be emphasised that the operating activity results are not affected by the costs resulting from the sources of asset financing; in other words: NOPAT is indifferent to the structure of the entity financing¹². It should also be indicated that the level of NOPAT should be affected only by the events from within the operating activity.

The NOPAT calculation may be made in two ways: the first one with the net profit as the starting point and the second when we begin the calculation from the income items. Both solutions are connected with the conducting of a thorough analysis of every item in the profit and loss account as well with the selection of the categories which are not connected in the strict sense with the operating activity. The example of these categories may be costs of leasing revealed in the operating area, which should be "shifted" to the capital costs, as in real terms they are costs of financing assets by the "credit in kind." Certain doubts may also arise with reference to the items revealed in incomes or financial costs, e.g. exchange rate differences or hedging instruments operations.

A certain controversy is also caused by the determination of the invested capital, in particular its part in the form the third-party interest bearing capital. And doubts appear in the case of the liabilities which do not have the character of the capital invested from the outside, i.e. the so-called trade liabilities (on

¹¹ A. Cwynar, W. Cwynar, Zarządzanie wartością spółki kapitałowej – koncepcje, narzędzia, systemy (Capital company value management – concepts, tools, systems), Fundacja Rozwoju Rachunkowości w Polsce, Warszawa 2002, p. 106.

¹² The aforementioned indifference does not refer to the issue of the amount of income tax paid because the taxable income is calculated on the basis of all the items which belong to the tax deductible costs, including interest costs.

account of supplies and services, taxes etc.), towards employees and other in-company liabilities. The trade liabilities, whose cost in the form of trade loan is calculable in real terms do not generate interest (financial costs), and possible cost are revealed in the operating activity (including lost prompt payment discount). In the author's opinion the calculation of the component value of EVA requires the application of the operating approach method extorting from NOPAT and invested capital a unanimous qualification of incomes and costs and from the operating effect the economic, not accounting dimension.

A financial entity, i.e. a bank has a different structure of a profit and loss account than non-financial entities. The operating activity result¹³ is an item including an interest capital cost. The aforementioned forms of EVA calculation are not adjusted to the banking sector. Thus, it is a mistake to directly use the result of operating activity to calculate the economic value added. This result should be first properly adjusted in order to obtain the combination of incomes and costs from the operating bank activity.

In this place, it is worth considering the issue of the definition of the bank operating activity. The activity is not conducted by the bank at the customer's account but the bank's own account, referred to as the so-called trade (investment) portfolio. The question arises whether this type of activity should be treated as operating activity. It seems that from the formal perspective it should, as according to the bank statutes, the bank is to conduct the trade activity. Then, the profits and losses generated by the trade portfolio should affect NOPAT. If banks do not conduct any investment activities of these activities are inessential for them, it seems appropriate not to include the effect of these activities in the NOPAT calculation.

The article presents below the author's self-designed proposal of the NOPAT calculation result for the bank possessing, apart from a bank portfolio, also a trade portfolio. The proposal includes two variants¹⁴:

- 1) variant 1 – when the starting point is net profit – see Table 1,
- 2) variant 2 – when the starting point is profit positions – see Table 2.

¹³ In profit and loss accounts there is a term: operating activity result in the reports of non-financial entities there is an item: result from operating activity.

¹⁴ The presented proposal.

Table 1. NOPAT calculation – variant 1

I.	Interest income
II.	Interest costs
III.	Net interest income (I-II)
IV.	Commission and charges income
V.	Commission and charges costs
VI.	Net commission and charges income (IV-V)
VII.	Dividend income
VIII.	Result on financial instruments at fair value
IX.	Trade activity result
X.	Net foreign exchange gains
XI.	Remaining operating income
XII.	Remaining operating costs
XIII.	Deductions for credit and loan value
XIV.	General administrative expenses
XV.	Depreciation
XVI.	Operating activity result (III+VI+VII+VIII+IX+X+XI+XII-XIII-XIV-XV)
XVII.	Profit and loss share of associated and co-subordinated entities
XVIII.	Gross profit (loss) (XVI+XVII)
XIX.	Income tax
XX.	Net profit (loss) (XVIII-XIX)
XXI.	Net profit adjustment (a-b-c+d+e-f+g+h+i+j):
	a. share in profit and loss of associated and co-subordinated entities, remaining compulsory profit reduction (loss rise)
	b. result of extraordinary operations
	c. reserve value difference and result of assets evaluation update
	d. general administrative costs (i.e. operating leasing instalments, depreciation of assets used on account of financial leasing)
	e. remaining operating costs
	f. remaining operating incomes
	g. net foreign exchange gains (i.e. exchange rate difference concerning received credits, loans and other sources of financing)
	h. adjustment by financing costs (e.g. financial leasing instalments)
	i. commission costs (i.e. commission on received credits, loans and other sources of financing)
	j. interest costs (i.e. interest on received credits, loans and other sources of financing)
XXII.	NOPAT (XX-XXI)

Source: own materials.

Table 2. NOPAT calculation – variant 2

I.	Interest income (incl. credits, securities deposits etc.)
II.	Interest costs
III.	Adjustment of interest costs by financing costs (including interest on received credits, interest on subordinated loans, interest/discount on self-issued securities)
IV.	Interest result (I–II+III)
V.	Commission income
VI.	Commission costs
VII.	Commission costs adjustment by financing costs (commission of received credits etc.)
VIII.	Commission result (V–VI+VII)
IX.	Commercial activity result
X.	Net foreign exchange gains
XI.	Bank result (IV+VIII+IX+X)
XII.	General administrative costs
XIII.	Depreciation
XIV.	Legal persons income tax (CIT)
XV.	NOPAT (XI–XII–XIII–XIV)

Source: own materials.

The author claims that when qualifying profits and costs within the operating area, one should be reasonable and consider the compliance between NOPAT and invested capital – the derivatives from the invested capital (i.e. interest) should not affect the level of the net operating profit after tax. Summing up the consideration in this area, it should be stated that it is necessary to analyse the profit and cost of the operating result in order to eliminate possible pollution of the accounting result of operating activity.

The EVA value would be calculated based on the formula:

$$EVA = NOPAT - (C \times CoC),$$

where:

EVA – economic value added,

NOPAT – net operating profit after tax,

C – sum of own and third-party capitals,

CoC – average weighted capital cost.

Due to the complicated and laborious NOPAT process, it is appropriate to retain, within the operational result, the costs derived from financing sources, and to adjust the other EVA element. In other words, C should be replaced with equity value E, CoC with the equity cost CoE. The formula of EVA calculation becomes:

$$EVA = NOPAT^* - (E \times CoE)$$

where:

*NOPAT** – NOPAT including financing cost,

E – equity value,

CoE – cost of equity.

The NOPAT* calculation for the bank possessing a bank and trade portfolio may look in the following way (variant* 1 – when the starting point is profit, is identical as variant 2 when the starting point is income positions – see Table 3):

Table 3. NOPAT calculation – variant* 1 and variant* 2

I.	Interest income
II.	Interest costs
III.	Adjustment of interest costs by financing costs (including interest on received credits, interest on subordinated loans, interest/discount on self-issued securities)
IV.	Interest result (I-II+III)
V.	Commission incomes
VI.	Commission costs
VII.	Commission costs adjustment by financing costs (commission of received credits etc.)
VIII.	Commission result (V-VI+VII)
IX.	Result from commercial activity
X.	Net foreign exchange gain
XI.	Bnak result (IV+VIII+IX+X)
XII.	General administrative costs
XIII.	Depreciation
XIV.	Legal person income tax (CIT)
XV.	NOPAT* (XI-XII-XIII-XIV)

Source: own materials.

4. Profitability measurement concept at the level of transaction, client and product

4.1. Profitability in ex-ante accounts

The operational tool improving the capital effectiveness is the measure of capital profitability calculated at the lowest level, i.e. a single transaction and a single client. Taking into account the deliberations on the allocation of the regulatory capital, at this stage, it should be assumed that the best solution is to treat capital on the bottom-up basis.

The profitability measure should be a multifunctional tool allowing the seller to set the transaction parameters in such a way as to generate the expected return or to answer a question concerning the amount of the margin so that the credit decision could be positive. This means as a consequence that the profitability measurement should be made in ex-ante accounts. In order to achieve this goal, the modified RORC or RORAC indicator may be used. Firstly, the measure based on regulatory capital is presented.

The regulatory capital is in this case arbitrary due to the fact that in the process of the bottom-up allocation the level of transaction of client is ascribed only with the credit risk capital requirement.

The formula of the regulatory profitability calculation is as follows:

$$\text{Business RORC} = \frac{\text{transaction result}}{\text{credit risk capital requirement}}$$

where:

Business RORC – regulatory capital profitability at the transaction level

The calculation of the credit risk capital requirement for a single transaction does not pose any real difficulty. The calculation of the numerator's value in this formula needs discussing. For the purposes of the calculation, BUSINESS RORC in the *ex-ante* account does not possess all the necessary information to calculate the transaction result, on the contrary to the *ex-post* approach. In order to estimate the result of the transaction the method of calculation should be modified (simplified). The transaction incomes should include only two items: interest incomes and commission, and costs should be limited to the expected risk costs. The indicator calculation formula is transformed into the following:

$$\begin{aligned} \text{RARORC}_{\text{BUSINESS}}^{\text{TR}} &= \frac{(P_{\text{Interest}} + P_{\text{Commission}}) - EL}{(Z_{\text{TR}} \times W_R) \times 8\%} \\ RC_{\text{CR}} &= (Z_{\text{TR}} \times W_R) \times 8\% \end{aligned}$$

where:

$RARORC_{EX-ANTE\ BUSINESS}^{TR}$ – profitability adjusted by the capital requirement risk on account of credit risk at the transaction level (*ex-ante*),

$P_{Interest}$ – interest income from the proposed transaction,

$P_{Commission}$ – applied transaction interest incomes adjusted by the effective interest rate (ESP),

EL – expected risk cost, the so-called expected standard risk costs,

Z_{TR} – the value engaged on account of the applied transaction (credit value exposition),

W_R – risk weight appropriate for the applied transaction (also depending on the kind of product and client risk),

RC_{CR} – credit risk regulatory capital = credit risk capital requirement

The standard risk costs (EL – expected loss) is calculated based on the calculation formula below:

$$EL = PD \times LGD \times EAD$$

where:

PD – the probability of default on the applied transaction,

LGD – the value of the lost credit exposition for the applied transaction,

EAD – the expected exposition value at the moment of default on the applied transaction.

Two issues are worth emphasising here. Firstly, the transaction profitability calculation does not include the costs of its servicing, i.e. the so-called operating costs, e.g. sales force remuneration, remuneration related costs, materials used, outsourcing costs, depreciation etc. Secondly, the obtained level of profitability is only a potential value, which may become a real result only when the assumed transaction and client parameters are fulfilled.

The *ex-ante* profitability at the level of transaction is not enough when the client possesses or plans to make use of different bank products. The effects generated by the so-called cross-selling of up-selling should be considered then. The profitability of a single transaction becomes unreliable and it is necessary to calculate the return on a particular client. The client profitability in the *ex-ante* account is calculated based on the following formula:

$$RARORC_{BUSINESS}^{KL} = \frac{WB_{EX-ANTE\ BUSINESS}^{KL} - K_{RR} - EL}{\sum_{i=0}^n [(Z_{TR} \times W_R) \times 8\%]_i}$$

$$WB_{EX-ANTE BUSINESS}^{KL} = \sum_{i=0}^n (P_{Interest} + P_{Commission})_i$$

where:

$RARORC_{EX-ANTE BUSINESS}^{KL}$ – adjusted by the profitability risk requirement on account of credit risk at the level of the client (ex-ante), calculated for n transactions (with consideration to the applied transaction),

$W_{EX-ANTE BUSINESS}^{KL}$ – business result obtained from the client enlarged by the result from the applied transaction,

$P_{Interest}$ – interest incomes with consideration to the applied transaction,

$P_{Commission}$ – commission incomes adjusted by the effective interest rate with consideration to the applied transaction,

K_{RR} – real risk costs, the so-called expected standard risk costs (reserves created on account of the transactions concluded with the client so far),

EL – expected risk costs, the so = called standard risk costs,

Z_{TR} – engaged value on account of the transaction (credit exposition value) with consideration to the applied transaction,

W_R – risk weight appropriate to the transaction (also to the product and client) with consideration to the transaction,

$i = 1, 2, \dots n$ – the number of transactions concluded with the client with consideration to the applied transaction.

The transaction profitability as well as the client profitability, after having been duly modified, can be calculated in a slightly different and shortened form:

$$RARORC_{EX-ANTE BUSINESS}^{TR} = \frac{M_{O,P} - K_{RR} - EL}{(W_R \times 8\%) \times 100\%}$$

where:

$RARORC_{EX-ANTE BUSINESS}^{TR}$ – requirement profitability on account of credit risk at the (ex-ante) transaction level rentowność

$M_{O,P}$ – interest margin [%] enlarged by the commission rate [%] and adjusted by the effective interest rate generated from the transaction,

K_{RR} – real costs of risk [%] (reserves created on account of the transactions concluded so far with the client in relation to the value of engagement on account of these transactions),

EL – expected risk costs [%] (expected loss from the applied transaction referred to the value of this transaction),

W_R – risk weigh appropriate for the transaction (also the product and client) with consideration to the applied transaction.

The tool supporting the seller's decision, allowing for the calculation, based on the aforementioned measures of potential profitability, of the future transaction profitability will not only provide the information on the return on the transaction or client but after the modification of the indicator, it will prompt the decision maker how much the value of incomes (or $M_{O,P}$) amount to, so that the transaction would generate the minimum expected profitability rate (set top-down).

The presented profitability calculation method at the level of transaction is not complicated and can be efficiently implemented into the decision processes in the bank. The only difficulties may be caused by the EL estimation as this parameter is not determined by the seller. As a rule, it is calculated with a econometric (statistical) model complex model supported not only by the parameters from the applied transaction but also with a considerable amount of historical data.

An essential element to form the level of the capital requirement for credit risk is the consideration given to the transaction collateral in calculations. The aforementioned model is a basic tool at the highest level of simplification and it does not include this issue. The inclusion in the capital requirement calculation of the kind and value of security may considerably change the level of transaction profitability and consequently the business decision. It seems extremely important that the business decisions supporting tool should allow for the introduction of information on security and enable the change in security parameters so that the transaction in question could bring the highest benefit to the bank.

The profitability measure built on the economic capital may become a tool supporting the business decision making process. It may be used to measure the profitability of a single transaction or the profitability achieved at the client level. The economic capital profitability in the ex-ante account is calculated based on the following formula:

$$RAROEC_{EX-ANTE BUSINESS}^{TR} = \frac{(P_{Interest} + P_{Commission}) - EL}{EC_{TR}}$$

where:

$RAROEC_{EX-ANTE BUSINESS}^{TR}$ – adjusted by the economic capital profitability risk generated by the applied transaction (ex-ante),

$P_{Interest}$ – interest incomes from the applied transaction,

$P_{Commission}$ – commission incomes adjusted by the effective interest rate from the applied transaction,

EL – expected risk costs, the so-called expected standard risk costs,

EC_{TR} – economic capital value generated by the applied transaction.

Due to the fact that the economic capital calculated at the transactional level, includes primarily the credit risk, similarly to the capital requirement, the real profitability will be based on the single risk covering capital. It should also be mentioned that the practice of the calculation of the economic capital covering credit risk is made at the client level. This means that at the beginning it is necessary to make the calculation of the economic capital covering the credit risk with consideration to the applied transaction. Only then can the allocation into particular client transactions be made, including the applied transaction and the profitability calculated.

The profitability of economic capital to cover the client credit risk in the ex-ante account may be calculated based on the following formula:

$$RAROEC_{EX-ANTE BUSINESS}^{KL} = \frac{WB_{EX-ANTE BUSINESS}^{KL} - K_{RR} - EL}{EC_{KL}}$$

$$WB_{EX-ANTE BUSINESS}^{KL} = \sum_{i=0}^n (P_{Interest} + P_{Commission})_i$$

where:

$RAROEC_{EX-ANTE BUSINESS}^{KL}$ – risk adjusted profitability of economic capital generated by the client (ex-ante) calculated for n transactions (including the applied one),

$WB_{EX-ANTE BUSINESS}^{KL}$ – gross result obtained from the client with consideration to the applied transaction,

$P_{Interest}$ – interest incomes with consideration to the applied transaction,

$P_{Commission}$ – commission incomes adjusted by the effective interest rate with consideration to the applied transaction,

K_{RR} – real costs of risk (reserves created for the transactions concluded with the client so far),

EL – expected risk costs, the so-called expected standard risk costs,

EC_{KL} – the value of the economic capital generated by the client with consideration to the applied transaction.

In conclusion, it should be said that the economic capital calculation models are complex, based on many variables and many data, which presently practically absolutely prevents the calculation of its value directly and ad hoc (e.g. for the purpose of business decisions). Furthermore, the calculation of the return at the transactional level is a secondary step possible after the primary calculation of the profitability on client. On the other hand, the practical measurement of the profitability based on the economic capital to cover the credit risk is possible in the ex-post account.

To conclude these deliberations, the calculation of profitability of individual banking products is also worth mentioning. The profitability calculation at the transactional or client level is appropriate for the corporate bank activity. Sales force have relatively large possibilities of adjusting transaction parameters to the demand of an individual client, e.g. they can set the level of margin, interest, commission etc. In other words, they make a special offer for the client through tailoring it. In the case of retail business the situation is as a rule different: the product is usually standardised. Clients' advisers can hardly change the product parameters, e.g. the level of commission is set top down and depends on the client's own contribution. This means that the seller has a limited room for manoeuvre and is not able to offer anything from outside the set area. It results from the fact that when the product is constructed, its parameters are selected in such a way as to make every transaction generate the assumed minimum rate of return. Thus, in practice it is not necessary to calculate the profitability to the profitability of every applied transaction as it is known in advance. However, the bank management may be interested in the information on the real profitability of the offered products. Therefore, this calculation is made from the historical perspective (ex-post).

4.2. Profitability in the ex-post account

The aforementioned model of profitability analysis at the level of transaction and client may also be used for reporting or informative purposes as well as the calibration of the ex-ante calculation tools. Admittedly, the use of the real figures allows us to obtain the information about the actual effectiveness of the undertaken business activity. In order to achieve this, the financial data used at the moment the application is considered are replaced by the actual information about the client and transaction. The calculations in the ex-post account should be made in monthly cycles in order to make use of the full information on the incomes and costs, i.e. to base on the adjusted result by the internal settlements and real risk costs (for example, considering in calculations the actual, not applied, use of credit by the client).

$$RARORC_{EX-POST\ BUSINESS}^{TR} = \frac{WB_R - K_{RR}}{RC_{TR}}$$

where:

$RARORC_{EX-POST\ BUSINESS}^{TR}$ – real profitability adjusted by the capital requirement risk at the transactional level (ex-post),

WB_R – transaction gross result (without reserves),

K_{RR} – real costs of risk (reserve created for the concluded transaction),

RC_{TR} – real capital requirement generated by the transaction.

The executed gross result on transaction is calculated as a sum of interest incomes and commissions (calculated in time – effective interest rate) adjusted by calculated transaction margins, commissions and charges without including reserve. The result is reduced by the real costs of risk based on the existing transaction and client parameters, e.g. actual involvement, client rating etc.

The denominator of the indicator is the result of the full and complete calculation of the capital requirement generated by the transaction including its all recognised security. The capital requirement should not include only the credit risk requirement. It should be enlarged, for example, by the credit risk requirement (if the client transactions generate such requirements). It should be emphasised that according to the general principles of the profitability calculation, there should be an average of value of the regulatory capital for the given period. This poses a strict demand concerning the effectiveness of the system calculating the capital requirements as they should be calculated at the end of every day. It will allow for the calculation of the average requirement value at the end of the month. The indicated differences between the calculation of profitability in the ex-ante and ex-post account should be considered at the moment of combining and analysing the results of the given transaction.

The aggregated results of the transaction of the given client, standard costs of risk and the regulatory capital are the basis of calculation of the real profitability on the given client:

$$RORC_{EX-POST BUSINESS}^{KL} = \frac{\sum_{i=0}^n (WB_{Ri} - K_{RRi})}{\sum_{i=0}^n RCTRi}$$

where:

$RORC_{EX-POST BUSINESS}^{KL}$ – real profitability of the capital requirement at the client level ex-post),

WB_{Ri} – executed gross result of an “i” transaction of the given client (without the creation of reserves),

K_{RRi} – real costs of risk of an “i” transaction of the given client (reserve created for an ”i” transaction concluded with the given client),

$RCTRi$ – real capital requirement generated by an “i” transaction of a given client.

The calculation of margins, commissions, gross results of standard risk costs etc. at the transaction level with the possibility of aggregation to the client level may constitute the basis for the analysis at different planes. Making use

of the additivity of the numerator and denominator of the presented measures, it is possible to calculate the profitability achieved by individual sellers (client advisers), the profitability of product sales units (branches, regions) or business lines. It is also possible to calculate the profitability of a business line, for example, corporate or retail. The formula of the profitability calculation is as follows:

$$RARORC_{EX-POST\ BUSINESS}^{LB} = \frac{WB_{LB} - K_{RR}}{RC_{LB}}$$

where:

$RARORC_{EX-POST\ BUSINESS}^{LB}$ – real profitability of capital requirement at the business line level (ex-post),

WB_{LB} – executed gross business line result (without reserves), for corporation line $WB_{LB\ CORPO} = \sum_{i=1}^n WB_{KLi}$, where WB_{KLi} gross result executed on an “i” within the corporation business line, for retail line $WB_{LB\ RETAIL} = \sum_{i=1}^n WB_{PRODi}$, where WB_{PRODi} gross result executed on an “i” product of a retail business line,

K_{RR} – business line real costs of risk (created reserves calculated on the basis of the real transaction data),

RC_{LB} – real capital requirement generated by the business line. RC_{LB} should be the sum of regulatory capital on account of the credit, market and operational risk related to the business line.

While considering the calculation in the ex-post account, it is also worth pointing to the possibilities of applying the economic capital to calculate the profitability of individual transactions. The calculation formula $RORC_{BUSINESS}^{TR}$, after replacing the regulatory capital by the economic capital, may become an additional measure of profitability. This measure should also be applied during the decision making process. The difficulty in calculating $ROEC_{BUSINESS}^{TR}$ lies in the practical possibilities of calculation of the economic capital at the level of a single transaction. The models used by banks usually allow for the direct calculation of the economic capital to cover the credit risk with reference to a particular client. The portion of capital with reference to a particular transaction is obtained in an artificial way through its allocation, whose the key is the capital requirement generated by every transaction. Furthermore, economic capital calculation models are limited to the calculations in the ex-post account, which makes it impossible to apply an additional measure while making current business decisions. Due to this, banks are now using economic capital to calculate profitability historically. The formula below shows how to calculate the profitability of economic capital at the client level:

$$ROEC_{EX-POST BUSINESS}^{KL} = \frac{\sum_{i=0}^n (WB_{Ri} - K_{RRi})}{EC_{KL}}$$

where:

$ROEC_{EX-POST BUSINESS}^{KL}$ – real profitability of economic capital at the client level (ex-post),

WB_R – executed gross result on an “i” transaction (without reserves),

K_{RR} – real costs of risk (created reserves calculated based on the real transactional data),

EC_{KL} –real economic capital calculated at the client level.

The transaction allocated economic capital (with reference to a single client) is used to calculate the individual profitability of every transaction according to the formula:

$$ROEC_{EX-POST BUSINESS}^{TR} = \frac{WB_R - K_{RR}}{EC_{TR}}$$

where:

$ROEC_{EX-POST BUSINESS}^{TR}$ – the real profitability of economic capital at the transactional level (ex-post),

K_{RR} – real costs of risk (reserves created on the basis of real transactional data),

EC_{TR} – transaction allocated real economic capital calculated at the client level.

In the ex-post account it is possible to calculate the profitability of products offered to retail customers. The calculations may be made on the basis of the regulatory or economic capital. The calculation formulae are as follows:

$$RORC_{EX-POST BUSINESS}^{PROD} = \frac{(\sum_{i=0}^n WB_{Ri}) - K_{RR}}{RC_{PROD}}$$

where:

$RORC_{EX-POST BUSINESS}^{PROD}$ – real profitability of capital requirement at the product (ex-post),

WB_{Ri} – executed gross result of an “i” client who possesses the product (without reserves),

K_{RR} – real costs of risk of an “i” transaction of the client (reserves created for an “i” transaction concluded with the client),

RC_{PROD} – real capital requirement generated by the product.

$$ROEC_{EX-POST\ BUSINESS}^{PROD} = \frac{(\sum_{i=0}^n WB_{Ri}) - K_{RR}}{EC_{PROD}}$$

where:

$ROEC_{EX-POST\ BUSINESS}^{PROD}$ – real profitability of economic capital at the product level (ex-post),

WB_{Ri} – executed gross result of an "i" client who possesses the product (without reserves),

K_{RR} – real costs of the product risk, (reserves created on the basis of the real transactional data),

EC_{PROD} – real economic capital calculated for the product.

Summing up the deliberations on the measurement of profitability at the lowest levels, it should be pointed to the possibility of application of the indicators in the decision making process. The implementation of measures, especially those in the ex-ante accounts, within the decision making process allows for its improvement on the one hand, and guarantees the pre-assumed results that should be obtained as a result of the decisions made by the sellers. The consideration of the profitability measures in the decision making process brings another advantage in the form of transfer of knowledge of risk and its impact on the results of the central, back office level on the "front line", i.e. sales staff. The sales units staff, apart from orienting their activities on the execution of sales plans, should also pay attention to the effectiveness of the decisions they make. The selection of more effective clients, with the identical transactional price terms, means the selection of the lower risk client, which should translate into the improvement of the bank credit portfolio.

The next section of the article will present a practical aspect of the implementation of instruments of capital effectiveness measurement in a commercial bank. It will also discuss the problem of effective allocation and re-allocation of capital and present the concept of the "capital bank."

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Kenny Crossan
School of Management
Edinburgh Napier University
Thomas Henschel
School of Accounting, Financial Services and Law
Edinburgh Napier University

Corporate Governance: An Holistic Model for SMEs

1. Introduction

The term corporate governance is now firmly part of modern business terminology and is widely used by commentators, businessmen and academics. However the exact meaning of corporate governance is still open to much debate, where on one hand some see it as a proxy for shareholder power, others see it as just a set of basic legal guidelines that large public limited companies have to follow. The average owner of a small firm may feel that neither of these two descriptions of corporate governance suggests a topic that is of interest to them or the operation of their businesses. However, this is due to the focus on ‘corporate’ and not governance within much of the debate in this area; there is no doubt that if we see governance as an holistic concept that is interested in fairness, responsibility, transparency and accountability then the relevance to Small and medium sized firms (SMEs) becomes apparent (Ramaswamy, Ueng and Carl, 2008). Indeed, given the difficult economic climate and the resultant difficulty for SMEs to access finance, you could argue that an interest in governance is not an option but a necessity for a large number of SMEs.

The aim from this review of the governance literature is to demonstrate how we can move from the wider concept of corporate governance to the more narrow focus of governance that is relevant to SMEs, and to demonstrate how this idea of governance can be of practical value to the average decision makers within SMEs.

2. Corporate governance, stakeholder theory and SMEs

The Cadbury Report of 1992 defines Corporate Governance as,

“The systems by which companies are directed and controlled, boards of directors are responsible for the governance of their companies. The Shareholders’

role in governance is to appoint the directors and auditors and to satisfy themselves that an appropriate governance structure is in place in the organisation. The responsibilities of the board include setting the company's strategic aims, providing leadership to put them into effect, supervising the management of the business and reporting to shareholders on their stewardship. The board's actions are subject to laws, regulations and the shareholders' general meeting". (Cadbury, 1992:Para. 2.5)

This represents one of many different definitions of corporate governance. The UK, US and the OECD have all developed codes of best practice that have been based on shareholder theory and the price mechanism. This means that the shareholders are the ultimate owners of the firm, that they bear the risk and in return gain any profits that the firm makes. More recently in his review of corporate governance and the financial crises Walker (2009) states that,

"The role of corporate governance is to protect and advance the interests of shareholders through setting the strategic direction of a company and appointing and monitoring capable management to achieve this" (Walker Report, 2009; p. 23).

However, this narrow focus on boards of directors and shareholders is problematic, as it is only directly applicable to joint stock firms that have a formalised management structure and a separation of ownership from control. Most firms in the UK (and the world) are small firms, over 99.9% of all firms in the UK are classified as SMEs and the idea of a separation of ownership from control is not a relevant issue (Crossan, 2010). Then average SMEs, which may be a family run firm or an owner-managed firm, may not have any separation of ownership control or external shareholders and may not think that such issues are relevant for them. There is a danger in trying to apply the concepts of large firm governance to smaller firms who may not have formal board or management structures, and who may think that there is little to gain from concepts such as governance (Gibson, 2009). However this to some extent more to do with the language used rather than the underlying ideas of good governance, which can benefit all firms.

The Institute of Directors take a more holistic approach to the concept of governance and understand that it is not exclusively to do with the control of management by external shareholders, they state:

"Corporate governance means rigorous supervision of the management of a company; it means ensuring that business is done competently, with integrity and with due regard for the interest of all stakeholders. Good governance is, therefore, a mixture of legislation, non-legislative codes, self regulation and best practice, structure, culture and board competency" (The Institute of Directors, 2010, p. 1).

This view of governance is more influenced by the ideas offered by the stakeholder model (Freeman, 1984; Evan and Freeman, 1988; Blair, 1995). The stakeholder model suggests that firms should aim to maximise stakeholders' wealth, and not just shareholders' wealth. A stakeholder is any group or individual, who can affect or be affected by the actions of the firm. This includes workers, the local community, shareholders, customers, suppliers, lending institutions *etc.* The Executive Power Model (Hutton, 1995; Kay and Silberston, 1995) claimed that the purpose of the firm is the maximisation of corporate wealth as a whole.

Nwanji and Howell (2007) suggest that stakeholder theory is distinct in that it is a theory of management that includes morals and values as an explicit part of organisational management. Philips, explains this relationship between values and management as follows,

“Managing for stakeholders involved attention to more than simply maximising shareholder wealth. Attention to the interests and well-being of those who can assist or hinder the achievements of an organisation's objectives is the central admonition of the theory” (Philips, 2003; p. 16).

Therefore the stakeholder approach to governance may be more relevant for SMEs than the more narrow ideas offered by the shareholder theories, as SMEs may be forced into closer relationships with their stakeholders than is necessarily the case in a larger firm or they may be forced to consider these stakeholders' input more directly than is the case with larger firms. One of the motivations for an SME to have governance structures maybe to demonstrate to third party stakeholder (Lending institutions) that they have an appropriate management and control structure in place.

A set of legal guidelines that determines a minimum standard of corporate governance may well be appropriate for large joint stock firms that sell their shareholder to the general public but how useful this is for SMEs is open to debate. The aim of governance within SMEs is more complex than the control of managerial discretion, and it is important that we consider a more holistic approach to governance for SMEs where governance becomes interlinked with risk management, business planning and the overall strategy of the firm. Contingency theory suggests that firms are heterogeneous and this heterogeneity is likely to be more pronounced in SMEs than in larger firms, as they are less likely to rely on formal management structures that have been influenced by management consultants, business education *etc.* However whilst a set of legal regulations concerning governance may not be a good thing for SMEs an idea of what good governance is and how it can be useful to a small firm may be beneficial for SMEs. The appropriate governance system for any SME is likely to be determined by the context that the firms operate within and therefore the firms governance

arrangements will differ due to their industry norms, ownership type (family or private ownership) relationship with the bank or supplier *etc* (Uhlener et al, 2007). This also links back to a holistic approach to governance within SMEs which is to some extent a function of this heterogeneity and the fact that SMEs are almost forced to think of governance as a stakeholder concept as one of the most important issues for governance in this context is its ability to allow a small firm to present itself in a suitable light to potential customer, supplier and most notably financial services firms, from whom approval may be a necessity of firm survival. A central aim of this study is to explain what good governance practice is and to explain why it is beneficial for SMEs. We also plan to offer, simple and flexible ideas concerning how to implement governance systems into a firms existing management structures.

3. Current literature on Corporate governance in SMEs

A review of the current literature concerning the role of corporate governance in SMEs leads us to one conclusion: there are no substantial findings from the literature (Eesal, 2010). Although there have been some studies proposing a corporate governance model suitable for SMEs at a national or international level, they are limited in both their number and the usefulness of their findings (Brunninge, Nordqvist and Wiklund, 2007). This fact is often explained by corporate governance being an emerging branch of business management theory which has yet developed standards, and this is particularly the case when we consider corporate governance in SMEs and not in general terms (Abor and Adjasi, 2007).

Basel II, the new international equity capital regulations on lending by banks, is the source of much uncertainty for SMEs. As part of the evaluation and rating process borrowers are subject to, Basel II demands that a lending bank makes an assessment as to how any company deals with corporate governance and risk management.

The Basel II regulations do not explicitly demand the establishment of comprehensive and formal corporate governance and risk management systems (Basel Committee on Banking Supervision, 2005). Nevertheless, when rating an SME, the lending bank will assess the management accounting instruments and the abilities of management to operate their company in an efficient manner. As part of this evaluation of the management of a firm, a bank will be looking to ascertain that an appropriate governance system has been implemented and this could also include issues such as succession planning (Geppert and Martens, 2008).

A corporate governance system is, however, necessary for SMEs, not only because it is required by law or by the Basel II regulations, but rather because it is in the interest of the SMEs. The reason is that such enterprises have a high potential to become insolvent and the most frequent causes of insolvency are management errors and weaknesses in the company structure. This is especially true during the first seven years following the establishment of the company (Almus, 2004; Herbane, 2010).

The European Union classifies firms as Micro, small or medium sized depending on the number of employees, annual turnover and balance sheet totals (see table 1).

Table 1. Small and Medium-sized Enterprises: EU Subclasses

Subclass	Number of employees	Annual turnover (million euros)	Balance sheet total (million euros)
Micro firm	< 10	≤ 2	≤ 2
Small firm	< 50	≤ 10	≤ 10
Medium-sized firm	< 250	≤ 50	≤ 43

Source: Commission of the European Communities (2005).

To belong to one of the classes micro, small and medium-sized, a firm must fulfil the following conditions:

- the number of employees lies below the respective threshold in Table 1,
- furthermore, at least one of the thresholds for annual turnover and balance sheet total is met,
- the “legal independence criterion” must be fulfilled. No more than 25 percent of the equity is owned by one or more companies which themselves do not meet the threshold conditions, detailed in table 1.

The above definition has been valid since 2005 and is updated in terms of annual turnover and balance sheet total at longer intervals of time (Commission of the European Communities, 2005).

Internationally there are major differences in the classification systems used to define SMEs. For example, in the United Kingdom a company with fewer than 250 employees is considered to be an SME, however in the USA a firm with less than 500 employees is classified as an SME (Dana, 2006).

In order to ensure comparability with other research results, the EU (SME) classification will be used in this project to classify firms.

The research work carried out to date on corporate governance in SMEs can be grouped into the following main themes: risk management and contingency planning for SMEs, where there has already been a significant amount of research

(Islam et al., 2008). The other area is the attitude of SMEs towards business management techniques (Schachner et al., 2006).

4. Components of a suitable Corporate Governance framework in SMEs

Among the management subsystems that have been discussed most frequently with respect to a connection with corporate governance, business planning comes first (Gleißner et al., 2004). The use of instruments of performance measurement comes second (Wolf, 2003). The literature sources agree that corporate governance is only useful if it is linked with the already existing management subsystems (Wolf, 2003). The linking of the subsystems for a holistic corporate governance model takes on special importance and has so far not been widely investigated by the literature (Münzel and Jenny, 2005).

Figure 1. Holistic Corporate Governance Framework



Schematically, Figure 1 displays the approach to a holistic corporate governance framework, as seen by the authors of this paper. On the topic of a holistic corporate governance model very little of relevance to SMEs is available (Eesel, 2010). The idea is that the governance system of any SME will be shaped by

the interaction of these four key issues: management behaviour, business planning, performance measurement and risk management. The fact that these issues are, to some extent, content driven means that the development of governance systems in SMEs will be an organic process. That is to say that, each SME will develop their own governance systems that will be dependent on the environment in which they operate and their own internal sub systems; there will be many differences between the systems operated by different firms, in contrast with the current standardisation of governance that we see in large firms (specifically PLCs). However, these four key factors will play a part in shaping the governance systems in all SMEs and it is this holistic approach to governance which is the main differentiating factor between large firm governance and governance in the SME sector.

As Mugler (1980), Hollman and Mohammad-Zadeh (1984) and Kirchner (2002) have argued, corporate governance has to be thought of in much broader terms than merely accountability and transparency. SMEs need strong support with the systematic implementation of corporate governance processes since generally they lack the necessary resources and the management knowledge to establish an effective corporate governance system (Kirchner, 2002). The authors describe what the shape of the corporate governance system should be and which tools could be chosen for it. They do not go into any further detail on how the corporate governance process can be integrated into existing management systems.

Recently, as Ossadnik et al. (2004) reveal, SMEs have increasingly become the object of research activities and in particular of empirical investigations. These studies concentrate more closely on business planning and management systems and their assessment in the course of rating in the light of Basel II (Berens et al., 2005; Geppert and Martens, 2008). Flacke and Siemes (2005) also gave some consideration to questions of corporate governance. They come to the conclusion that SMEs simply overestimate their corporate governance and risk management abilities. According to investigations carried out by Herbane (2010), Almus (2004) and Wildemann (2005), the most frequent reason for insolvencies in SMEs is that, owing to a lack of management skills, they did not identify critical company developments early enough. This substantiates the importance that management behaviour, business planning, performance measurement and risk management have for corporate governance; the following subsections of the literature review cover each of these points.

4.1. Management Behaviour

The successful managing of a company presupposes that a business strategy has been established. The first part of this section therefore considers how formally the establishment of a strategy is actually carried out in SMEs and which techniques

are applied to implement it. The section concludes with the investigation of the attitude to risk. In particular it analyses whether there are differences between SMEs and large firms and how the attitude to risk may influence the management of SMEs.

In their longitudinal studies, Frese et al. (2000) and van Gelderen et al. (2000) revealed that the application of strategic planning techniques in the individual phases of a company is not continuous. Companies which have not established a strategy are the least successful, which often results in the company closing down. The companies only react to external influences (“reactive strategy”), and there is no proactive management.

The most successful companies are those that base their planning during the start-up phase in accordance with the “critical point strategy.” This strategy concentrates on one goal at a time, aiming to solve the most difficult problem first, thereby making strategy an iterative process. It is also noticeable that, having survived the founding phase (the time period has not been quantified more closely), the most successful companies are those which then switch from a “critical point strategy” to a “complete planning strategy” (a top-down approach with a long-term planning horizon). Complete planning means producing a comprehensive set of plans which actively structure given situations.

A further aspect which was investigated was just how far the different planning strategies help to deal with uncertainty in the world outside the company (industrial level uncertainty: change, complexity). Complexity is positively associated with the complete planning strategy and negatively with the critical point strategy. Complete planning strategy is negatively influenced by the changeability of the environment.

Fletscher and Harris (2002) confirm the findings of Frese et al. (2000) and van Gelderen et al. (2000). The written description of the company strategy is of the greatest importance for the survivability of the company, particularly in the start-up phase. Other important points are that the board of directors should discuss the strategy with the employees and that progress towards its implementation should be monitored. As Fletscher and Harris (2002) have also observed (with micro-firms and small-firms), directors express the desire for an increased level of specific practical advice on implementing strategic planning to be taught in further training courses for entrepreneurs.

Woods and Joyce (2003) have also established that owner-managers have less strategic planning skills than other managers. It is not that owner-managers view these techniques more sceptically but rather that they simply have less knowledge of the methods. A situation similar to that of strategic management techniques can be observed in the operation of risk analysis techniques and

corporate governance issues, which can be especially seen in companies with up to 50 employees. One explanation is certainly that the other managers were often previously employed in larger companies and so had already come into contact with appropriate techniques. Woods and Joyce (2003) confirm that, as company size increases, the owner-managers begin to take on other managers to provide support for the top management. They also confirm that a greater utilisation of strategic methods could be seen than in the companies surveyed.

Richbell et al. (2006) draw on the results of Woods and Joyce (2003) and confirm that the owner-managers characteristics can have a significant influence on the business planning activities and corporate governance in small firms. In particular, the level of education and previous work experience in a large firm immediately before setting up their firm and running firms in sectors outside their previous experience, have a significant influence on the attitudes on planning activities and corporate governance practices. According to Richbell et al. (2006) there is very limited research into the factors influencing the planning practice of owner-managers, which need further investigation.

As Schachner et al. (2006) note, the literature contains a number of individual (and to some extent contradictory) findings. One reason is that there have been relatively few studies on the phenomenon of owner-managers (Richbell et al., 2006). There remains some debate concerning the extent to which the size of an owner-managed firm is the relevant factor which determines the quality of the management, or if other factors such as the educational background of the owner-manager is the key deciding factor (Schachner et al., 2006).

Management and decision-making are significantly influenced by the way a company deals with uncertainty and risks. In the following section, the literature is critically analysed in order to assess if managers of SMEs have different attitudes towards risk than managers of larger firms.

As McCarthy (2000) and Sparrow and Bentley (2000) note, the literature has mainly investigated financial risks. According to the authors, SMEs have a completely different view of risks to that taken by large companies. While larger companies make much more utilisation of formal methods for the optimisation and management of individual risks, SMEs attempt to make a more comprehensive risk assessment. In contrast to large companies SMEs generally have only one risk strategy, namely that of bearing the risk themselves (risk taking). They only take out standard insurance cover for damage resulting from fire, water, loss in output and interruption to operations. The risks are assessed more in terms of the business sector in which the company is active, *i.e.*, in terms of supplier, customer, technology and the internal business processes and not the individual firm characteristics.

The authors also determined that the subjective view of the respective manager/owner is often a barrier to systematic risk assessment in SMEs. These individuals prefer to view and allow for the specific risks associated with their business sector in a somewhat simplistic manner. Further, a managing director often makes such an overall risk assessment by himself and keeps it to himself, not discussing risk aspects to any great extent with the employees. At the same time the directors interviewed admitted that they lacked knowledge of the methods exercised to identify and assess risks. In the opinion of Sparrow and Bentley (2000), this problem could be overcome by the operation of appropriate training programmes for SMEs. Such programmes should not simply involve adopting the risk management training used for very large companies, however the authors are not specific about how SME programmes should look in practice.

As has already been mentioned in the subsection on management behaviour, owner-managers often have a different attitude towards management techniques, and the same is true for their attitude towards risk.

While the personal link with the company exercises a significant influence, the treatment of risks is independent of gender (Watson and Robinson, 2003). Female controlled firms appear to be no more risky than male controlled ones.

Decisive choices are made in terms of how risks are dealt with as early as the beginning of the life cycle of a company – the start-up phase. Empirical evidence supports the main hypothesis that even very young firms, which proactively apply formal strategic planning methods, will tend to perform better than those following a more visionary or reactive approach to running the business (Smith, 1998; Miller, 2007). The greatest weaknesses, where any were admitted to, lay with access to sources of finance, market share and foresight or forward planning in the business. Smith (1998) therefore infers that most firms in the early stage of their life-cycle are prone to over-exaggerating their own strengths and under-estimating the threats from rival firms and from other factors external to the firm. Further, the small minority of firms which formulate realistic expectations tend to experience enhanced performance. A special finding of the study is that the high performers typically had accurate, up-to-date and detailed financial information. Again, highly performing firms disclosed that they had higher skills than the lower performers in that they were most likely to produce their own accounts without any outside help.

According to a study carried out by van Gelderen et al. (2005) the points for a successful company are set as early as the pre-founding phase. Indeed the critical evaluation with the possible risks during the founding phase is decisive for the subsequent survivability of the company. The involvement of professional consultants or advisors also has a positive influence on subsequent survivability.

The results of the study must be treated with some caution, since it is the first of its kind. As Janney and Dess (2006, p. 396) note, “the involvement in a ‘network’ with other potential founders of companies has also a positive effect on the founder’s ability to assess risks”.

Given the deficits identified in terms of management behaviour, external pressure through Basel II is certainly helpful, as it leads to companies acting in their own interest (even if the formal requirements are to some extent too demanding). Left to themselves, SMEs would experience little improvement in terms of company management (Ossadnik et al., 2004; Berens et al., 2005; Geppert and Martens, 2008).

In summary, one can state that the personal attitudes of the managing director and his knowledge of business management methods have an essential influence on the management system of SMEs. In particular, regarding the use of management techniques and the need for further training, recent literature sources distinguish between owner-managers and other managers. For Scottish SMEs until recently (2011) there have been no studies on this topic. One aim of the present research project is to analyse – with respect to possible differences between the outcomes for owner-managers and for other managers – the handling of business planning systems and of instruments of performance measurement.

Information is needed whether there are characteristic differences between owner-managers and other managers in handling the above systems and instruments. Such differences must also be taken into consideration when regarding the implications for developing corporate governance systems.

Summarising, one can state that the personal attitudes of the managing director and his knowledge of business management methods have an essential influence on the corporate governance structure of SMEs.

Taken together, these points support the following prediction:

H1: Corporate governance sophistication will be higher in Other-managed firms than in owner-managed firms.

4.2. Business Planning

Strategic management requires planning (operationalisation of the strategy). Planning is based on assumptions which in turn are associated with uncertainty. Much of the literature on uncertainty and risk therefore concerns business planning, which is particularly true for the international literature on SMEs.

Perry (2001) discovered that the critical size above which a systematic planning in the form of a master budget begins to make sense is from 5 to 15 employees. Below this level detailed written planning makes little sense, and it

cannot positively influence the potential to insolvency. However, if the company employs more than 15 employees, detailed planning has a clear positive effect on the likelihood of insolvency. Perry (2001) further determined that SMEs are either good planners or they are non-planners; there is no intermediate group between these extremes.

What has to be said in criticism of Perry's study is that one cannot generalise that above a particular size business planning makes sense. The type of company and industrial sector in which it is active certainly exercise a considerable influence. However, there is no information on whether differences between industries have any bearing.

Gibson and Cassar (2002) state that the age and size of the company have a substantial influence on the quality of planning. As size increases, the responsibility for business planning shifts from the company management alone to the lower levels (accounting and controlling functions). The level of training and knowledge also has a positive effect on successful planning (see for example Ekanem, 2010).

In the empirical work on business planning in SMEs the focus of the investigations so far has been on what effect the quality of the business planning has on the financial performance of the company. In this context the investigation often considered how far uncertainty of the external environment influences the attitude to planning. One interesting point here is that the various empirical studies carried out reach very different conclusions.

Thus for example Schwenk and Shrader (1993), Rue and Ibrahim (1998) and Gibson and Cassar (2002) determined that an increase in uncertainty leads to increased business planning, which in turn proves to be helpful for the management of the company. However, the authors themselves note that the exact cause and effect relationships of the effects of uncertainty on the operational and strategic business planning are not easy to explain and that longitudinal studies will have to be carried out to investigate this phenomenon. A one-off postal survey or meta-analysis of studies carried out is not by itself sufficient to reveal the influence of variables such as industry sector, company age etc.

In contrast to that, Matthews and Scott (1995), van Gelderen et al. (2000) and Frese et al. (2000) determined that, as perception of environmental uncertainty increases, strategic and operational planning decrease, which holds for both owner-managed and other SMEs. For the most part, this pattern was consistent regardless of the source of the uncertainty (financial, competitive, governmental). It was not possible to determine whether there are significant differences between industrial sectors, since, as the authors themselves admit, the sample sizes were often relatively small.

As for example Rauch et al. (2000) have shown, the value placed on planning as a tool for managing uncertainty varies with culture and country. The authors investigated the influence of uncertainty on the attitude to planning in a study involving German and Irish SMEs with up to 50 employees. According to Hofstede (2005), there is a high level of uncertainty avoidance in Germany, which makes cultural planning appropriate and successful. Rauch et al. pointed out that planning in small-scale enterprises is related to success only in cultures that value uncertainty avoidance. Uncertainty avoidance is related to planning because planning is perceived to help control future events and thus to reduce the uncertainty of running a business. Since Germany as a whole values planning highly, only business owners and other managers who plan in detail have a good fit with their culture and achieve success. It was found that the quality of business planning is positively related to success in Germany.

Therefore, we hypothesise that:

H2: Business planning formality will be positively related to corporate governance sophistication.

4.3. Performance Measurement

Classic business planning is only oriented towards quantitative measures (financial measures). For long-term development however non-financial measures are also important. But financial measures stand at the end of the business process. A comprehensive performance measurement system should therefore contain not only financial (“lagging”) measures but also non-financial (“leading”) measures. Of the various instruments available to performance measurement which consider both types of measures the Balanced Scorecard (Kaplan and Norton, 1996a and 1996b) has taken on special significance in recent years. Further, the introduction and application of shareholder value and knowledge management for SMEs has also been the subject of intensive discussion in the last few years (Hudson et al., 2001; Hudson Smith and Smith, 2006).

One important task of corporate governance is to identify critical developments early enough so that sufficient time is still available to take countermeasures. It is therefore relevant to study to what extent such instruments of performance measurement can at all improve the management of SMEs and still be of benefit to risk management and corporate governance. After all, as the studies on management behaviour have revealed, many SMEs complain about the inadequate strategic instruments for company management.

As Hudson et al. (2001) have discovered, SMEs have quite a positive view of the newer approaches offered by performance measurement. The surveyed

companies have recognised that the indicators on company management which are strongly financially-oriented are not by themselves sufficient. SMEs also complain that it takes too long to collect the data and that by the time information is available it is often out of date. According to Hudson et al. (2001), it can also be noted that many indicators display no link to company strategy.

Hudson et al. (2001) also state that limited resources represent substantial barriers for the successful implementation of performance measurement systems within SMEs. For this reason they suggest an iterative process be exercised for the implementation of such a system. An iterative approach more closely corresponds to the ad-hoc style of decision-making in SMEs, since results from the introductory process become apparent over the short term and thus changes desired by the entrepreneur can be introduced more easily. Having evaluated 10 performance measurement systems available from the literature, Hudson et al. (2001) determined that the Balanced Scorecard is a very good reflection of what SMEs expect from a tool which may support them in monitoring their performance.

Hudson et al. (2001) view the Balanced Scorecard as an appropriate management system for SMEs and suggest that firms may benefit from the following advantages if they improve the communication within the company:

- more structured evaluation and improved reporting
- the stimulation of thinking on appropriate measures
- the encouragement of team-based processes
- continuous improvement.

Fernandes et al. (2006) recommend that in the development of the BSC in SMEs the number of indicators should be kept well below 20. The reason is that in SMEs the processes are not so complicated and therefore 10 to 15 indicators would be quite sufficient. According to Fernandes et al. (2006), other aspects important to a successful implementation are: support from university academics (since there is a generally sceptical attitude towards consultants and people are scared of their high costs), strong support from the top management and good co-operation within departments

The implementation of a BSC system strongly benefits from and is supported by the existence of ISO 9000 systems, since these techniques already contain a large amount of data important to the BSC. Gumbus and Lussier (2006) point out that those SMEs with as few as five employees can successfully introduce a BSC system and benefit from its application and improve their performance.

None of the empirical studies cited investigated whether the Balanced Scorecard is also an appropriate tool to support the corporate governance processes in small firms.

As Smallman (1999) notes, strategic, operational and legal risks are difficult to manage, since often mathematical or statistical procedures cannot be applied. These risk categories call for knowledge and foresight on the part of the employees. It would therefore appear to be sensible for an SME to organise itself so as to obtain details of this inestimable wealth of knowledge. Such an approach would at the same time support communication of the risk management systems to employees. In Smallman's opinion (1999) such an approach would promote a comprehensive, company-wide risk management.

Smallman (1999) suggests that the BSC can be used as a tool to communicate the firms risk management structures to the employees and that it can also be used to document the knowledge that the employees have concerning risk management. The BSC observes the company from different perspectives by monitoring the critical success factors for each of them. So Smallman's idea (1999) to use the BSC for knowledge management is convincing. The BSC supports a structured assessing of these success factors and in this way a stepwise implementation of a knowledge database.

As Alquier and Tignol (2006) determined, knowledge management can merely be a path-finding route for SMEs to developing a practical corporate governance and risk management system. The construction and application of a knowledge management system can provide the company with a "corporate risk memory tool." Fed with the experience gained from earlier projects, it can be practiced as a good starting point for estimating the risks of new proposals as well as a source of information for new staff having just joined the company.

Based on this discussion, we hypothesise that:

H3: The use of performance measurement tools will be positively related to corporate governance sophistication.

4.4. Risk Management

The literature reveals that risk management is still in an early phase of development and that no standards for SMEs have become established which would describe how a comprehensive risk management should appear (Islam et al., 2008). There is also little in the existing SME literature on actual implementations of risk management methods, and as a result this aspect is now being covered in more depth by current research projects (ICAEW, 2005; O'Hara et al., 2005; Berry et al., 2007).

The research work carried out to date on risk management in SMEs can be grouped into the following main themes: one area is the management of financial risks and the insurance coverage of SMEs, which has already been more heavily

researched (Deakins and Bentley, 1995). The other area is the attitude of SMEs towards risk (Anney and Dess, 2006; Watson and Robinson, 2003; Sparrow and Bentley, 2000; Smallman, 1996).

It is generally accepted that the risk management process basically consists of the following four steps (Vaughan and Vaughan, 2001):

- identification of risks,
- quantification and thus evaluation of risks,
- management and control of risks,
- continued reporting on the development of risks.

As part of the organisation of risk management the company management therefore has to set out the basic strategies for risk management and to nominate the personnel in the company to be responsible for the steps risk identification, evaluation and control.

Smallman (1996) argues that a holistic risk management is characterised by three main aspects.

The first aspect is a continuous monitoring of all sources of risk. Here special attention should also be given to what are termed 'weak signals'. Information on risks should be gathered together from the most diverse sources and in particular from the customer and market perspectives.

The second aspect is the combination of qualitative and quantitative techniques on risk assessment and risk monitoring. Since qualitative (*i.e.* non-financial) risks also play a large role in the assessment of risks, it is not possible to concentrate only on probability theory and actuarial models, qualitative techniques such as scenario planning must be used in conjunction with more traditional methods. More recently the literature on modern performance measurement techniques (such as Balanced Scorecard or shareholder value) emphasises their application for risk management purposes (Scholey, 2006; Calandro and Lane, 2006).

The third aspect that must be considered concerns the organisational learning where one learns from past errors and disasters and where a culture is established in the company allowing for a positive approach to dealing with mistakes and does not punish employees for mistakes. In this way a knowledge management within the company can also be employed for the purposes of risk management. On top of this, one should take into account the company's culture and leadership structure, in particular the management behaviour in SMEs (Janney and Dess, 2006; Richbell et al., 2006).

For a risk management process being able to work it is also essential that there is a holistic integration into the existing business planning and performance measurement systems. Without this integration risk management would only

remain mere “empty talk” and of no value for the firm. The employees would not see its benefit, they would only think of it as an additional workload. If, in contrast to that, risk management were integrated into the standard planning process, the acceptance would increase, leading to a more systematic and comprehensive risk assessment (O’Brien, 2009). Only in this way risk management in SMEs can be established which ensures practicability and low costs.

In summary, we propose:

H4: Risk management sophistication will be positively related to a company’s sustainable development.

5. Conclusion

During this study corporate governance had been introduced and discussed in detail. It has been possible to move the focus of the study from the wider concept of corporate governance, as applicable to all firms and to focus on governance issues that are of particular importance for SMEs. The concept of a holistic approach to SME governance has been introduced, defined and explored in detail during the literature review. The idea of business planning, performance measurement, risk management and management behaviour all influencing and helping to shape the nature of governance in SMEs has been explained. The heterogeneous nature of SMEs means that each firm will formulate governance structures specific to their needs. However, these key determinants (business planning, performance measurement, risk management and management behaviour) will play a key role in shaping the governance structures in all SMEs.

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Monika Czerwonka
Collegium of Management and Finance
Warsaw School of Economics

The concept of socially responsible investing (SRI) in Poland

1. Introduction

SRI has experienced an uneven growth in the world in the last few years (Eurosif 2010, Report on Responsible Investing in the United States 2010). Recent years have seen the development of SRI in the United States, as well as in Europe. Assets under management in Europe rose from 17.6% in 2008 to almost 40% in 2010 (Eurosif, 2010; Asset Management in Europe, 2010), whereas in Poland SRI is still very much a niche market. Therefore, it is necessary to understand the obstacles to the development of Polish SRI, focusing specifically on the Polish demand for SRI from an individual perspective.

This study will first review the Polish situation and will present the development of SRI in Poland. Next it will present the objectives and methodology of the study. The results section will detail the main findings of the study. The final section will provide conclusions and discussions in which the research implications are outlined.

2. Socially responsible investing in Poland

Socially responsible investing is quite a new area of interest of contemporary finance, an alternative way to invest one's assets. SRI apart from financial return considers also environmental or social aspects of investment decisions. Socially responsible investors are interested not only in maximising their financial return in the long run but also in taking into consideration other non-financial issues, so called ESG factors (Environment, Social and Governance) (Eurosif 2010). In other words social investors want to earn money and make a difference in the world while staying true to their beliefs (Logue 2009, p. 8).

There has been quite a lot of research conducted in the field of SRI: in the United States (Kinder et al. 1994; Kinder and Domini, 1997; Louche and Lydenberg, 2006), in Canada (Hudson and Wehrell 2005), in Australia (e.g. Jones et al. 2008; Humphrey and Lee 2011) as well as in Europe (Sparkes 2001;

Sparkes and Cowton, 2004; Solomon et al. 2002; Bengtsson 2008; Lozano et al. 2006) or Japan (Sakuma and Louche 2008). However little attention was devoted to the existence of the SRI concept in emerging economies (Michellotii et al. 2010; Arosio M., 2011), and only one study brings up the existence of the SRI market in Poland (Eurosif 2010).

This situation is not surprising because the Polish SRI market is still in its initial phase. It results from the fact that the Polish capital market is very young (Warsaw Stock Exchange- WSE started in 1991 after the collapse of communism in 1989) and Polish investors still tend to perceive the Stock Exchange exclusively in terms of financial returns. There is still a weak consciousness of social responsibility in both the business community and among individuals. World trends show that aspects of social responsibility are more important for investors, managers, business partners, employees, consumers in developed countries with a high GDP and high social and environmental awareness, than in countries where the basis for business and consumer decisions is still price, quality and in the case of the capital market- rate of return (OECD 2007). Investors in the developing countries lack awareness and understanding of the importance of business ethics and its advantages. Some of these advantages may not be visible to these investors in the short-term e.g. reputation or brand management is not important for them. This is a result of an absence of long-term vision and focus on survival in the short-term (Mahmood 2008).

Although the Polish capital market does not have a long history it is very dynamic in growth. At the present time (04.04.2012), there are 424 listed companies (390 domestic and 39 foreign) on the WSE. The total capitalisation of companies listed on the WSE accounted for 108.6 billion Euro at the end of 2011 which makes the WSE the most important financial centre in East-Central Europe (capitalisation of Wiener Boerse 64.3 billion Euro, Prague Stock Exchange 29.4 billion Euro).

However the SRI market in Poland is slowly acknowledging its importance. In 2010 Eurosif (European Sustainable Investment Forum) for the first time reported about SRI in Poland. According to the report the Polish SRI market amounts to 1 billion Euro, which represents approximately 0.3% of the total financial assets under management in Poland. Compared to the European SRI market which in 2010 amounted to 5 trillion Euro (Eurosif 2010), SRI in Poland still plays a minor role in the whole European SRI market.

The concept of responsible investing started with the development of corporate governance standards (the first best practices were introduced in 2002). The newest 'Best Practices of WSE Listed Companies' were effective in January 2008 and refer to areas where they may have positive impacts on the

market valuation of companies, thus reducing the cost of capital. The main topics addressed in these 'Best Practices' are the transparency of companies, communication between investors and companies, as well as the protection of shareholders' rights.

The first ethical Polish fund – "Etyczny 1" (*ethical 1*) was launched in 2008 by SKOK (mutual fund company). Since then Polish investors have had a chance to locate its assets ethically, in accordance with environmental or social factors. SRI development continued and up until now the Polish SR market offers the following products: SR mutual funds (ecological and ethical), SR Index, pro-ecological structured products such as: bank loans, current bank accounts, bonds.

At the end of 2011 on the Polish capital market operated 50 mutual fund companies which offered 744 mutual funds (or sub-funds). Only 5 of them were Polish SRI funds (ethical and ecological) and several foreign mutual SRI funds. There was also one SRI pension fund which claimed to have an ethical policy. Compared with other European countries, SRI in Poland is still in its early stages of development. The number of SR retail funds in Europe has reached 886 at the end of 2011, with 240 funds in Belgium, or 220 funds in France (Vigeo 2011).

However there has been a positive signal for SRI in Poland, as in 2009 the launch of the first SR index in East-Central Europe- the RESPECT Index has been introduced. It lists now 23 companies from the Warsaw Stock Exchange with the highest 'A' ratings. Since its inception in 2009 the index earned around 120% (YTD), as compared to 25% (YTD) raised by the WIG 20 (the most popular index used as benchmark on the WSE)¹.

Finally, it should be mentioned that in contrast to other European markets, in Poland there does not exist any network promoting SRI (a Social Investment Forum, which is common in Anglo-Saxon countries). However, organisations such as: Forum Odpowiedzialnego Biznesu (*eng. Forum of Responsible Business*) or internet portals such as: "www.odpowiedzialne-inwestowanie.pl" (*eng. responsible-investment*) or www.odpowiedzialni.gpw.pl (social responsibility group on the Warsaw Stock Exchange) have actively contributed to spreading awareness of SRI among investors through specific campaigns, research projects and publications. Moreover in order to promote the idea of SRI or CSR among Polish investors the government has taken some interesting initiatives with the development of a working group on Responsible Investment under the auspice of the Ministry for the Economy.

¹ Information from the Warsaw Stock Exchange on 15.04.2012.

3. The influence of religion on investors' behaviour

Faith has always played an important role in human life. People do have a natural need to seek God. The three biggest monotheistic religions, in the number of believers in the world are: Christianity, Judaism and Islam. All of the three religions have the same golden rule: "One should treat others as one would like others to treat oneself" (Christianity), "You shall not take vengeance or bear a grudge against your kinsfolk" (Judaism) or "None of you [truly] believes until he wishes for his brother what he wishes for himself" (Islam). However different cultures and the history of these religions may affect effective cooperation and are often the cause of conflicts. At the same time we are forced to seek common solutions to global problems connected with globalisation, ecology or poverty. Therefore we should ask ourselves: "Does religion influence the economy or economic behaviour? Can we evaluate the behaviour of contemporary *homo oeconomicus* without taking into consideration his or her morality or religion?"

There has been quite a lot of research on the influence of religion on investment behaviour. Many scholars have studied the role of religion in the broader field of corporate social responsibility (CSR) and business ethics (Brammer et al. 2007; Van Buren 2007; Hui 2008; Ramasamy et al. 2010; Williams and Zinkin 2010).

Agle and van Buren (1999) found a small but positive relationship of a set of religious beliefs and practices to attitudes toward CSR. Weaver and Agle's (2002) analysis indicated that religious self-identity can influence ethical behaviour. Graafland and van der Duijn Schouten (2007) investigated the relationship between eschatological beliefs and the business conduct of executives and provided weak indications that eschatological beliefs influence the executives' socially responsible business conduct.

Some research was also devoted to faith-consistent investing (FCI), which incorporate one's beliefs into business practice. As examples of faith-consistent institutional investors we can mention: Catholic and Islamic SRI funds or different religious institutions such as churches. Faith investors are assumed to be the third largest group of investors in the world (Van Cranenburgh et al. 2010).

Girard and Hassan (2008), Hood et al. (2009) present research, which concentrates on issues related to risks, return and performance integrating religious principles in the investment strategy. Peifer's (2010) analysis of religiously affiliated mutual funds in the USA shows that religious morality can have an especially potent impact on financial behaviour. Ghoual and Karam (2007) investigated the investment goals and constituents of Christian funds, Islamic funds, and socially responsible investment funds. Schwartz et al. (2007)

examined RI from a Jewish perspective and Kreander et al.(2004) studied stock market investment practices of the Church of England and UK Methodists. Tahir, Brimble (2011) found that Islam does influence investment behaviour, however, the degree to which it does this is influenced by the degree of religiosity of the individual.

Therefore we can raise a question: is there a link between religiosity and proneness to SRI?

Already in 1994 Rossouw stated that someone with a Christian understanding of the unconditional value of life, cannot be careless in the workplace about products and quality-standards that pose a threat to the lives of consumers or employees (Rossouw, 1994, p. 564). Also Pope Benedict XVI in his last encyclical “Caritas in Veritate” (2009) said that the great challenge, accentuated by the problems of development in the global era and made even more urgent by the economic and financial crisis, is to demonstrate, in thinking and behaviour (...) that traditional principles of social ethics like transparency, honesty and responsibility cannot be ignored or attenuated. The Pope stressed that efforts are needed not only to create “ethical” sectors or segments of the economy or the world of finance, but to ensure that the whole economy – the whole of finance – is ethical, not merely by virtue of an external label, but by its respect for requirements intrinsic to its very nature. This is what has been taught by the Church’s social teaching, underlining that the economy, in all its branches, constitutes a sector of human activity (Caritas in Veritate, 2009).

It’s also worth noting that religious aspects were initially the first historical factors in the evaluation of socially responsible investments (Kurtz 2008).

That is why the one of the main goals of this study, apart from presenting the SRI market in Poland, was to investigate the influence of religion on individual investors’ behaviour. It has been assumed that the idea of SRI should be more acceptable among faith-based investors in Poland. Therefore the main hypothesis states that religion does influence the willingness towards socially responsible investments.

4. A survey among Polish individual investors

Methodology

The main idea was to carry out the survey among individual Polish investors in order to enquire about their knowledge of socially responsible investing. One thought behind that was that the low level of SRI development in Poland could be caused by the low level of investors’ awareness of the idea of SRI. The other

target was to investigate if there is a correlation between faith and investors' inclination towards SRI or ethical investments.

The survey was conducted using 361 individual Polish investors. It was done with the cooperation of The Association of Individual Investors in Poland through their web site. The form of the survey was a questionnaire which consisted of 14 questions about the awareness, interest and implementation of the SR idea in praxis. Most of those surveyed investors were male (83% of the sample) and young (up to 40 years of age amounted to 77% of the sample). The average amount of capital invested on the WSE balanced between 10 000 to 50 000 zł (where 1 Euro = 4,1 zł). 40% of investors declared themselves as religious, 34% as practicing believers (so called "church goers"), and 24% as atheist or agnostics

Questionnaire

The questionnaire consisted of several questions referring to: awareness of the SRI idea, existing SRI practices and willingness towards SRI. The variables used in questionnaire stem from the literature review of past studies on SRI. They are explained below and are summarised in Table 1.

Table 1. Overview table of the variables

Factors/dimensions	Variables	Literature sources
Opinions about SRI	Awareness of SRI Most important negative and positive screens Future of the SRI market in Poland	Lewis and Mackenzie (2000) Valor and Cuesta (2007) Cranenburgh et al. (2010)
Existing RI practices	SRI tools used by investors	Eurosif (2010), US SIF (2010), Louche et al. (2012)
Behavioral intention	Perceived lower performance Willingness towards SRI Influence of faith on willingness towards SRI	Valor and Cuesta (2007)

Source: own materials based on Louche et al. (2012) and Valor and Cuesta (2007).

Opinions about SRI

One of the main reasons for not investing responsibly in Poland could be the lack of awareness. Questions about general interest in ethical investing and awareness of what SRI is were introduced in the questionnaire as the first. Next, respondents were asked about the most important, in their opinion, negative and positive screens. Here in contrast to Louche et al. (2012), Valor and Cuesta (2007) the questions referred only to the opinion not the existing SRI practices

of respondents. Some questions about the future of the SRI market in Poland were introduced in order to investigate the general attitude of investors and the outlook of the possible development of SRI in Poland.

Questions referring to the most important, in the participants view, positive or negative screens were measured on a scale from 1 to 5, where 1 meant that the screen was not very important, whereas 5 meant the high importance of the screen. The scales were based partly on previous scales found in Valor and Cuesta (2007), Van Cranenburgh et al. (2010) and Lewis and Mackenzie (2000) supplemented by new items and adapted to reflect the particularities of the sample.

Existing RI practices

In this section participants were asked about their current investment practices. In contrast to previous studies (Louche et al. 2012, Valor and Cuesta 2007) only one question to categorise four forms of possible SR strategies/tools used in Poland was raised, referring to: the SR Index, SR mutual funds, best practices reports or other SR strategies/tools.

Behavioural intention

One of the main reasons found in previous studies for not investing ethically was the (perceived) financial loss (Valor and Cuesta 2007). Therefore the respondents were questioned about the extent to which they would be willing to sacrifice financial returns. Participants were questioned about their intention to invest in an SRI mutual fund if the returns of the fund were lower than the benchmark. Finally, the influence of faith on the willingness towards SRI was measured. Fisher's exact test was used to compare the willingness to invest in SRI funds between religious and non-religious investors.

The questionnaire was written in Polish.

3.1. Results

The general awareness of the idea of SRI

Most of the surveyed individual investors in Poland (59%) were aware of the existence of SRI although over 40% admitted not having heard of the subject. The conducted survey shows a moderate level of investors awareness of the SRI idea. Compared with 93% level of SRI awareness among Spanish religious groups and charities (Valor and Cuesta 2007) – not directly connected with the financial market, the results did not seem satisfactory.

The moderate level of SRI awareness among Polish investors might suggest a lack of sufficient information about other than traditional ways to invest one's assets.

Positive and negative screens

On a scale from 1 to 5, where 1 meant that the screen was not very important, whereas 5 meant a high importance of the screen, the most important positive screens pointed out by Polish investors were: the protection of the environment (mean = 3,89), the protection of employees' rights (mean = 3,81), and the safety of products or services (mean = 3,73). These results correspond with the most used positive SRI criteria in Europe, where in first place we can find environmental concerns and employee issues (SRI Compass 2003).

The most serious negative screens pointed out by Polish investors were: the violation of human rights (mean = 4,45), pornography (mean = 3,95) and animal testing (mean = 3,62). The results do not comply with the results of secular RI investors in Europe or the United States where the most important negative screens shifted from focusing highly on tobacco and gambling in 2003 (US SIF 2001) to screening on weapons in 2008 (Eurosif 2008).

Table 2. Most important positive and negative screening strategies pointed by individual investors on a scale 1–5

Positive screens	Mean	Negative screens	Mean
Protection of the environment	3,89	Violation of human rights	4,45
Protection of employees' rights	3,81	Pornography	3,95
Safety of products or services	3,78	Animal testing	3,62
Pro-family policies	3,3	Weapons	3,35
Functioning according to one's religion	2,0	Gambling	3,02
		Tobacco and alcohol	2,52

Source: own materials.

The future of the SRI market in Poland

The results show that the majority of individual investors share a negative view of the future of the SRI market in Poland. 41% of investors attribute this to the low level of SRI awareness among investors, 24% to the low level of demand and 10% to the high cost of implementation of SRI strategies. This negative disposition toward the development of SRI among Polish investors is partly explained by the moderate level of investors consciousness about the SRI idea.

SRI tools used in practice

A majority of individual investors (67%) do not practiced any form of RI. 26% of investors read the best practice reports, 9% have used the SRI Index (Respect) and only 4% have invested in SR mutual funds. 2% of respondents declared to

have used other than listed forms or tools of SRI such as: CSR reports or the FTSE4Good index. These results confirm that the Polish SRI market is still in its initial phase and does not offer sufficient SRI products for investors.

The willingness towards SRI

Finally, participants were questioned about their intention to invest in the SRI mutual fund.

The investors showed a moderate interest in SRI funds. 39% (of the total sample of investors) would invest their money in an SRI fund if they were guaranteed the same rate of profitability as the benchmark. 27% would invest in an SRI fund if its profitability was higher than the benchmark. Only 11% would invest in the fund even if the returns were lower than the benchmark. 4% of respondents were so attracted by the idea of SRI that they would invest in an SR fund without any conditions on returns. The table 3 presents the data.

Table 3. Schedule of responses to the question about the intention to invest in SRI mutual fund among investors

I would invest in an SR mutual fund:	Individual investors (in %)
Without any conditions on returns	4
Even if the returns were lower than the benchmark	11
Only if the returns were at least like the benchmark	39
Only if the returns were higher than the benchmark	27
I would not invest in an SR fund	11
I have no opinion about it	8

Source: own materials.

Influence of faith on the willingness towards SRI among investors in Poland

In order to investigate if faith has an influence on investors decisions Fisher's exact test was used to compare the willingness to invest in SR funds between religious and non-religious investors. According to the collected data, 40% of individual investors in Poland declared themselves as religious, 34% as practicing believers (so called "church goers"), and 24% as atheist or agnostics².

The answers to the question about the intention to invest in an SRI mutual fund (presented in table 3) were grouped in two classes. The first class stood

² These data concerning Polish religiosity is comparable to the research results from the Centre for public Opinion Research in Poland (2005) where 97% of Poles declared themselves as believers (around 95% are baptized in a Catholic Church). However church goers were estimated at around 40% to 58% of population.

for potential involvement in an SRI fund and consisted of three answers (Yes, without any conditions on returns; Yes, even if the returns were lower than benchmark; Yes, if the returns were at least as those of the benchmark). The second class stood for no special interest in SRI investment (the answers: Yes, if the returns were above the benchmark and the answers: No, and No opinion). Participants willing to invest in an SRI fund only if the returns were better than the benchmark, higher than the social responsibility value profit maximisation. It has been therefore assumed that this group of respondents is not interested in SRI investment.

The null hypothesis stated: There is no correlation between faith and the investors disposition towards SRI. The alternative hypothesis stated that such correlation exists. Table 4 presents the correlation between the investors attitude towards religion and proneness towards investing in an SRI fund.

Table 4. Correlation between faith and proneness towards investing in an SRI fund

Attitude towards religion/faith <i>N</i> = 361	The number of investors willing to invest in SRI fund	The number of investors not interested in investing in SRI fund	<i>P</i> -value for Fisher's exact test
Agnostics/atheists	39	41	0,2599
Religious investors	75	57	
Agnostics/atheists	39	41	0,0172
Practicing believers ("church goers")	73	37	

Source: own materials.

Fisher's exact test shows that at level of $\alpha = 0.05$ there are no significant differences in willingness to invest in an SRI fund between agnostics and the group of investors that declared themselves as religious. However the significant differences in willingness to invest in an SRI fund between agnostics and the practicing believers were found (*p*-value for Fisher's exact test = 0,0172). We can also accept an alternative hypothesis about the correlation between faith and the investors disposition towards SRI investments. We can conclude that so called "church goers" are more open to the idea of SRI than the group of agnostics. This could result from the fact that it is important for practicing believers to incorporate their religion into business practice and invest their money according to their conscience. Therefore faith and religiosity seem to play an important role in one's willingness toward SRI.

Conclusion and Discussion

The aim of this article was to study the idea of SRI in Poland. In this process individual investors in Poland were surveyed. The general awareness of the idea of SRI, opinions about SRI and willingness towards ethical investing were measured. Given the growing interest in SRI, especially in emerging economies like Poland, this survey contributes to shedding a light on a research field of major importance.

In the light of the results of the survey, the main findings are presented. Thereafter, some potential directions for further research are provided.

Main findings

The conducted survey shows a moderate level of individual investors' awareness of the SRI idea (59% had heard about SRI). Given the limited knowledge about SRI, it is not surprising that participant investors do not use many SRI tools. A majority of individual investors (67%) do not practice any form of SRI. Similar to the conclusion from studies by Valor and Cuesta (2007) it seems that a vicious circle has been created: financial institutions do not invest in promoting SRI products because there is not enough demand; there is not enough demand for SRI because there is no or scarce information about these products in Poland.

The main reason for not investing ethically in Poland seems to be the low level of SRI awareness and the lack of information about the available offer of SRI products. Contrary to individual investors (Lewis & Mackenzie 2000b), participants of this study do not think that the main constraint for investing ethically is the lack of economic performance of SRI products.

The investors show a moderate interest in SRI funds. 39% would invest their money in an SRI fund if they were guaranteed the same rate of profitability as the benchmark. Only 11% would invest in the fund even if the returns were lower than the benchmark.

Research results confirmed also that faith and religiosity play an important role in one's willingness toward SRI. So called "church goers" are more open to the idea of SRI than the group of agnostics investors. This could result from the fact that it is important for practicing believers to incorporate their religion into business practice and invest their money according to their conscience. This finding coincides with the conclusion of previous studies of individual investors (Peifer, 2010; Louche et.al 2012). Such results suggest that there is a potential for SRI development in Poland due to the high level of religiosity among Poles.

This potential demand for SRI from individual investors should not be dismissed, since it represents an important niche in the financial market in Poland.

Taking into account these problems, the demand for SRI in Poland could be stimulated with the following strategies:

- 1) increasing awareness in society and within financial institutions and fund managers. It is important to increase the number of ethical funds with an ethical policy also for religious investors. Establishing a national SRI forum could also increase awareness of SRI among civil society and consumer groups, national and local governments and the financial industry in order to help the public better understand this kind of investment and the variety of products available;
- 2) increasing supply and commercial efforts from the financial industry. Fund managers should engage in further and better promotion of the products available and create new SRI products. In order to do that those financial institutions should first include their customers' demands when designing ethical products. This implies carrying out market research to detect Polish demands and the SRI investor's profile to satisfy them. Some conclusions about the investors demand can be extracted from this study;
- 3) introducing some SRI regulations to stimulate demand.

Policy makers could introduce more fiscal incentives for SRI development in Poland. However there are some tax allowances such as corporate tax exemption for green and ethical mutual funds in Poland, it seems still to be insufficient to attract enough attention for SRI development.

The majority of countries in Europe have opted to introduce some sort of regulation of SRI to foster its growth. Poland lacks both regulation and private initiatives and needs a clear framework for both investors and managers so that the SRI market can mature.

Direction for further research

This study provides important insights into the development of the SRI market in Poland. Despite growing interest in SRI around the world and the increasing value of assets under management using SRI strategies, little is known about SRI in emerging countries such as Poland. Also, not enough attention is paid to religious investors and their attitude towards SRI. This survey is a major contribution to this under-researched field.

The study presents the actual development of the SRI market and the level of awareness of the idea of responsible investment among individual investors in Poland. The survey provides a first trial of estimation of the SRI market in Poland with potential for further research. Many questions concerning the issue of institutional investors and their engagement in SRI remain open. It would be

also interesting to explore the awareness of socially responsible investing among other social groups such as for example students or clergy.

As has been suggested by Louche et.al (2012) the relationship between religious values and investment strategy needs be better understood. Taking into consideration the size of the sample, the findings of this study should be understood as exploratory and cannot be extrapolated universally. However some conclusions from this survey could serve as a basis for further research.

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Key resources in the hyperarchical organisation

1. Introduction

The sources of definition of a hyperarchical organisation can be found in the paper written by Evans and Wurster published in the Harvard Business Review in 1997¹. A hyperarchical organisation is a new organisational form, whose emergence was prompted by the development of new technology, especially the Web 2.0 network – Internet based on the interactive exchange of ideas, opinions between interconnected entities and the emergence of web communities. For the purpose of this paper, a hyperarchical organisation has been defined as a self-organising community built upon shared goals-ideas-projects, in which each member has unrestricted access to information and is able to communicate with any other community member in real time. A hyperarchical organisation is not restricted by rigid frames or boundaries. It is rather based on the use of the creative potential of its network entities. Furthermore, community members do not have to be formally associated with the organisation. They are linked together via commonly shared values, ideas, projects. Examples of hyperarchical organisations existing in real life comprise open source IT projects and communities gathered around those projects, communities using the wiki mechanism, e.g. Wikipedia or groups carrying out open innovation projects².

In the 90s of 20th century a resources based view of the organisation (RBV) was developed. The root causes of this view can be found in the ideas formulated by Penrose³, Wernerfelt⁴ and Barney⁵. According to a resources based view, an

¹ Evans Ph., Wurster Th. S., Strategy and the New Economics of Information, “Harvard Business Review”, Sep/Oct 1997, Vol. 75, Issue 5, pp. 70–82.

² More information about a hyperarchical organisation, its characteristics, sources of origin can be found in other publications released by the author of this paper, e.g.: Mrówka R., Hyperarchy as a new model of organisation, “Journal of Management and Financial Sciences”, Vol. IV, Issue 6, October 2011, Collegium of Management and Finance, Warsaw School of Economics, pp. 62–72.

³ Penrose E., The theory of the growth of the firm, Oxford University Press, Oxford 1959.

⁴ Wernerfelt B., A resource based view of the firm, “Strategic Management Journal”, Vol. 5, No. 1/1984, pp. 171–180.

⁵ Barney J. B., Firm Resource and Sustained Competitive Advantage, “Journal of Management”, Vol. 17, No. 1/1991, pp. 99–120.

organisation consists of assets (resources) and capabilities⁶. This theory is based on an assumption that competitive advantage is achieved due to optimal selection and allocation of resources on the imperfect market. The resources should be scarce, limited, with no substitutes and appropriately selected so that their usage would be difficult to copy. Most of the profits earned by an organisation can result from the utilisation of those scarce resources (both tangible and intangible) or, as noted by Hamel and Prahalad⁷, due to core competences, built upon available resources and capabilities. Development and utilisation of core competences and key resources related to those competences, which contribute to gaining competitive advantage, should become the major area of activity of an organisation.

The uniqueness of operations carried out by a hyperarchical organisation might indicate that such organisation needs specific resources in order to fulfil its mission and achieve its goals. Management of such resources might be challenging. The author's aim is to indicate the key resources of a hyperarchical organisation and determine how to manage these core resources. The author will focus his considerations on intangible resources in a hyperarchical organisation, especially, on the process of knowledge management.

2. Specificity of human resources management in a hyperarchical organisation

The activities carried out by a hyperarchical organisation, in most cases, result in developing a product, masterpiece, which is distinguished by its intangible and tangible attributes. The basic resources which are vital for a hyperarchical organisation and constitute a prerequisite for the organisation's success are intangible resources, especially knowledge held by its members, necessary for the achievement of predetermined objectives. The key task for a hyperarchical organisation is to attract, use and maintain the knowledge and competences of the people who form a part of the community, in which they exchange their ideas. Human resources management policy applied in a hyperarchical organisation should be however different from policies applied in traditional organisations, due to: the openness of the community, the limited role of rigid hierarchies, the essential issues on which the organisation focuses its attention, often voluntary participation in the community. It seems that a hyperarchical organisation perfectly fits with Perechuda's view, according to which: 'future organisations force dramatic change in the theoretical foundations of human resources management. The classic

⁶ Oblój K., *Strategia organizacji*, PWE, Warszawa, 2007, p. 127.

⁷ Hamel G., Prahalad C. K., *Przewaga konkurencyjna jutra*, Business Press, Warszawa 1999.

increase in turbulences occurring in the environment has a negative impact on the perpetuity of current procedures concerning hunting for, employing, training and dismissal of employees⁸. Additionally, it may be dubious whether members in a hyperarchical organisation can be employed or dismissed since employment and dismissal processes are managed by 3rd parties (owners, managers). In a hyperarchical organisation, however, the member himself decides about his involvement in activities carried out by the organisation, by contributing his time to the organisation. This topic was presented by Shirky in an interesting way. Shirky describes 'cognitive surplus'⁹, that is, the private, free time of people, as a global resource, which has been made available to other people and organisations, which was possible due to: connecting people with each other via networks, unrestricted exchange of information and ideas between community members. It is the free time of experts – a precious resource, which can be obtained and further managed, that hyperarchical organisations endeavour to attract. The free time of experts becomes an element of the hyperarchical organisation's competitive advantage. According to Shirky, due to the scale of this phenomenon, the availability of the free time of specialists, even using this resource to a minimal degree, can lead to spectacular effects. For example, Americans spend c.a. 200 billion hours per annum on watching TV, which is 2000 times more than time spent by all the people involved in creating Wikipedia¹⁰.

It therefore implies that one of the most valuable resources in hyperarchical organisation is the free time of thousands of experts who are involved in the works on specific projects. Undoubtedly, members of a hyperarchical organisation can be regarded as knowledge employees, i.e. people responsible for creation, dissemination and practical usage of knowledge. On the contrary, the feature distinguishing the knowledge of employees is their need to maintain their autonomy, different motivation and a different approach towards tasks carried out¹¹. As Perechuda notices, 'modern organisations (network, virtual, fractal, intelligent, learning and other organisations) cooperate with the knowledge of the employees or knowledge agents, who do not sell their knowledge and intellectual potential but make it accessible to others for a defined period'¹². Perechuda further observes: 'Knowledge agents are like nomads, who wander

⁸ Perechuda K., *Dyfuzja wiedzy w przedsiębiorstwie sieciowym. Wizualizacja i kompozycja*, Wydawnictwo Akademii Ekonomicznej im. Oskara Langego we Wrocławiu, Wrocław 2007, p. 14.

⁹ Shirky C., *Cognitive Surplus: Creativity and Genorosity in a Connected Age*, Penguin Press HC, 2010.

¹⁰ *Ibid.*

¹¹ Davenport Th. H., *Zarządzanie pracownikami wiedzy (Thinking For a Living. How to Get Better Performance and Results from Knowledge Workers)*, Wolters Kluwer Polska, Kraków 2007, p. 33.

¹² Perechuda K., *op. cit.*, p. 141–142.

from one organisation to another, and participate in one or multiple projects at the same time. Maintaining long-term relations with knowledge agents is highly advantageous for the network organisation¹³. Thus, it means that it is highly difficult to obtain the free time of members of hyperarchical organisations for exclusive use. A hyperarchical organisation should focus its efforts to achieve this resource for exclusive use, however, contemporary knowledge employees are distinguishable by their unwillingness to be permanently affiliated with and dependent upon only one organisation. Voluntary members, especially, of a hyperarchical organisation are not bound with the organisation by formal contract.

Such a state of affairs does not guarantee that a hyperarchical organisation will manage to maintain on a continuous basis the same resources, the same employees. This is however a feature typical for a hyperarchical organisation, which results from its flexible boundaries. On the other hand however, there is another analogy to network organisation, which can be applied here. Following Perechuda: 'Innovative potential of network organisation is maintained due to continuous re-configuration of its internal resources, which takes place during parallel implementation of multiple projects and other undertakings'¹⁴. With reference to a hyperarchical organisation one can speak not about the reconfiguration of internal resources but the reconfiguration of both internal and external resources. The flexibility of a hyperarchical organisation, its volatility, possibility of the parallel implementation of multiple projects and achievement of predetermined goals – from the perspective of numerous community members it is possible due to the organisation's openness, flexibility of boundaries and unrestricted flow of resources (both inflow and outflow).

Apart from that, it should be noted that many duties and tasks in hyperarchical organisations, especially those concerning technical activities, can be carried out by members formally employed and receiving remuneration for their work. Such employees can fall under traditional personnel management policy. Such situations occur in many IT open source projects, in which volunteers cooperate with employees on various projects. Such employees receive wages, and are often delegated to the project by organisations interested in the project outcome. Goldman and Gabriel, refer to open source projects, in which Hewlett-Packard and Intel were involved, and the ratio of volunteers to paid employees in open source communities might range between 5:1 and 6:1¹⁵. On the basis of the analysis of selected IT open source communities, Jorgenson evaluated

¹³ Ibid., p. 143.

¹⁴ Ibid., p. 226.

¹⁵ Goldman R., Gabriel R. P., *Innovation Happens Elsewhere. Open Source as Business Strategy*, Elsevier 2005, p. 49.

that paid employees account for 43% of all community members¹⁶. In the case of Wikipedia and its managing organisation – Wikimedia, the number of paid employees amounts to several dozen, which accounts for a negligible per cent of all members involved in the Wikipedia development.

The conclusions that follow the cases described in the preceding paragraphs imply that the number of volunteers out of all members in various hyperarchical organisations can vary significantly. However, even with regard to a paid employee, it cannot be assumed that their involvement in the hyperarchical organisation results only for financial reasons, that this is the only reason for which they entered the organisation. The key issue concerning human resources management in the hyperarchical organisation is the ability to attract new members and retain over a longer time horizon at least a group of members, a core group of key developers, leaders, who are responsible for most of the activities, projects in the pipeline.

3. The importance of knowledge and specificity of managing the knowledge

At this point it should be mentioned that from the perspective of a hyperarchical organisation, these are not community members who are precious but their activities and their knowledge which will become the basis for project realisation or the solving of an intellectual problem. In the light of contemporary network organisations, Perechuda notes that: ‘The basic strategic imperative is the provision of conditions necessary for creating non-public knowledge. Explicit knowledge (borrowed, articulated, codified) is contrary to tacit knowledge. Tacit knowledge is necessary in the process of developing foundations of management. Acceleration in business development can be achieved by an enterprise through developing its own, distinctive skills and competences, which constitute the core of tacit knowledge’¹⁷. It is hard not to agree with the above statement with reference to a hyperarchical organisation, of which the final outcome is an effect of activities carried out by all community members, and results from mutual inspiration and the exploration of people’s potential. The development of unique tacit knowledge, managing and using tacit knowledge is however much more difficult than managing and using explicit knowledge¹⁸. This results from

¹⁶ Jorgensen N., Putting it all in the trunk: incremental software development in the FreeBSD Open Source Project, “Information Systems Journal”, Vol. 11, No. 4, 2001, pp. 321–336.

¹⁷ Perechuda K., *op. cit.*, p. 225.

¹⁸ Nonaka I., Takeuchi H., The Knowledge-Creating Company. How Japanese Companies Create the Dynamics of Innovation, Oxford University Press, New York 1995.

the fact that tacit knowledge is difficult to explore and to articulate. The lack of sharing of tacit knowledge often results from the fact that the community members do not know how to share this knowledge¹⁹. A separate problem is the motivation and perceived need to share tacit knowledge. Many community members esteem their knowledge to such a high degree that they found it to be the source of their position and competitive edge and subsequently share this knowledge reluctantly²⁰. Tacit knowledge can be a source of power, as observed by Perechuda, ‘this applies especially to network organisations, having a heterarchical organisational structure’²¹, thus also hyperarchy, where position is built upon meritocratic principles. This problem can be mitigated by certain systems of the formalised exchange of knowledge, which facilitate the accumulation and codification of this knowledge. Nevertheless, such systems are rarely applied into practice, or they are, on purpose, inappropriately implemented and applied, for example such systems are littered with useless information in order to hide the precious knowledge and keep it for their owners²².

The problems with the development of unique knowledge in the network organisation may result from the fact that each community member has unique knowledge, which is incompatible with the knowledge of other community members. This entails the need for the continuous adaptation of the knowledge held by various community members. The prerequisite for the success in a hyperarchical organisation should comprise the accumulation and usage of unique, diversified knowledge provided by various experts, who are involved in the projects carried out by the organisation. On the other hand, however, the accumulation and usage of unique knowledge evokes multiple problems, enumerated in the preceding paragraphs, which many contemporary knowledge organisations have to face today. Will a hyperarchical organisation be able to overcome these problems?

It seems that many problems concerning knowledge management, as described above, should be solved with the use of the mechanisms which form the hyperarchical organisation. According to Shen, the goal/mission of a hyperarchical organisation is to share the knowledge and cooperation²³. This overall goal enables the working out of specific features of the hyperarchical organisation,

¹⁹ Weber S., Patterns of Governance in Open Source, in: DiBona Ch., Cooper D., Stone M. (ed.), Open Source 2.0. The Continuing Revolution, O’Reilly, 2006, p. 366.

²⁰ Davenport Th. H., *op. cit.*, p. 30.

²¹ Perechuda K., *op. cit.*, p. 225.

²² Weber S., *op. cit.*, p. 366.

²³ Shen X., Developing country perspectives on software: intellectual property and open source – a case study of Microsoft and Linux in China, “International Journal of IT Standards and Standardization Research”, Vol. 3, No. 1, 2005, pp. 21–43.

which comprise: information symmetry, possibility of peer-to-peer communication between community members, and the ability to cooperate in real time²⁴.

A bigger ability of a hyperarchical organisation to share the knowledge is also emphasised by numerous researchers. Donaldson et al notes that organisations based on voluntary work or informal organisations operating outside the formal boundaries of the companies can better support the flow of the knowledge on an individual level, as compared to traditional organisational structures²⁵. According to Kuo-Ming Chu, members of Internet communities are inclined and able to share their knowledge with other community members, because this results from their engagement in the organisation's activities²⁶. Endres et al maintain that tacit knowledge is more willingly shared in open source organisations than in traditional organisations²⁷.

Similar conclusions can be indirectly drawn from the analysis of features which foster knowledge sharing in the organisations. Following the Davenport opinion presented in his monograph on the management of knowledge employees, 'improvement in work based on knowledge should be, if possible, based on participation, i.e. knowledge workers are more willing to accept changes if they participate in the process of developing those changes'²⁸. In a hyperarchical organisation, most initiatives are initiated at the bottom line and result from activities undertaken by various community members. Moreover, Davenport adds that: 'Knowledge workers work the most effectively if they are gathered in a community, thus, managers should take an effort and help members to create a community even if they are scattered all over the world'²⁹. The whole hyperarchical organisation is a community, and its set up does not even require interference of 'managers'. 'Use of new technologies will certainly improve the work based on knowledge, however, the most efficient employees maintain that they receive the most valuable information from other members in the network (...) if the company supports the knowledge workers in the creation of the network with contacts, it can substantially increase their efficiency. The best knowledge

²⁴ Mrówka R., *op. cit.*

²⁵ Donaldson A., Lank E., Maher J., Connecting through communities: how a voluntary organization is influencing healthcare policy and practice, "Journal of Change Management", Vol. 5, No. 1, 2005, pp. 71-85.

²⁶ Kuo-Ming Chu, A study of members' helping behaviors in online community, Internet Research, Vol. 19, Iss: 3, 2009, p. 287.

²⁷ Endres M. L., Endres S. P., Chowdhury S. K., Alam I., Tacit knowledge sharing, self-efficacy theory, and application to the Open Source community, "Journal of Knowledge Management", Vol. 11, Iss: 3, 2007, p. 99.

²⁸ Davenport Th. H., *op. cit.*, p. 77.

²⁹ *Ibid.*, p. 171.

workers maintain more broad contact than average employees'³⁰. Hyperarchical organisations provide their members with both elements described above: new technologies enabling to share, gather, archive, search, complete information resources (e.g. Web sites, blogs, discussion forums, mailing lists, information archives, wiki mechanisms – enabling for the parallel use of the same documents). Nevertheless, above all, hyperarchical organisations are based on a network of contacts, and each community member, due to mechanisms provided by the network, can easily contact any other community member, and has access to a physical work environment which facilitates direct communication.

The importance of the mechanism described above has been emphasised by Lee, who notes that the contact of everybody with everybody with regard to the exchange of individual tacit knowledge (*tacit-to-tacit, person-to-person*) is the most effective way to share the total tacit knowledge³¹. However, as noticed by Bates and Stone, in projects carried out by a community, group communication is dominating³², however, in fact, many mechanisms diffuse one another in group communication: knowledge is gained from the group or the documents obtained by the community, but to a high degree, it results from direct contacts between the community members. However, other community members have access to these documents, thus it is referred to as group communication, which enables them to supplement their knowledge on a continuous basis, and mutually inspire themselves. It should be remarked that Bates and Stone maintain that such group communication is efficient only in smaller groups³³. However, in this aspect, a practical remedy for this problem is the modularity of a hyperarchical organisation, which enables the organisation to be divided into smaller, more efficient communities.

Why should members of hyperarchical organisations be so willing to share their tacit knowledge with other members, if this knowledge might help them to enhance their position in the organisation? To a certain degree, this question has already been answered – this results from the high level of involvement of community members, especially those who work voluntarily on the project. The second reason, perhaps even more important, has been described by Perechuda, who notes that: ‘despite the fact that the knowledge is consolidated into the project, it is not totally transferred and lost but it is multiplied. The knowledge

³⁰ Ibid., p. 137.

³¹ Lee L. L., Knowledge sharing metrics for large organizations, in: Morey D., Maybury M., Thuraisingham B. (ed.), Knowledge Management: Classic and Contemporary Works, MIT Press, Cambridge 2000.

³² Bates J., Stone M., Communicating Many to Many, in: DiBona Ch., Cooper D., Stone M. (ed.), Open Source 2.0. The Continuing Revolution, O'Reilly, 2006, p. 373.

³³ Ibid., p. 373.

is being created during action. (...) This is an interactive process requiring cooperation between employees, agents of knowledge and customers³⁴. Community members, by sharing their tacit knowledge, gain benefits and contribute to the development of this knowledge. The increase in the variety of competences held by other community members (a feature typical for the hyperarchical organisation), leads to more benefits that can be achieved by members who exchange the knowledge, which includes obtaining new tacit knowledge. Perechuda also notes that: 'advanced technological knowledge held by the organisation contributes to the creation of new, better in quality knowledge. This leads to a spiral, circulated increase in knowledge'³⁵. It should be mentioned however that this spiral increase in knowledge concerns both knowledge of the whole hyperarchical organisation, which contributes to its overall success, but also the individual knowledge of each community member involved in the organisation's activities. Sole membership in the hyperarchical organisation can be perceived by its members as beneficial. Due to the fact that the position in the organisation depends on the level of perceived competences, knowledge sharing and raising one's individual competences becomes the most obvious strategy for building and enhancing one's position in a hyperarchical organisation. A hyperarchical organisation becomes, as described by Perechuda, a 'friendly network', that is an organisation, that gives the possibility for the open creation of tacit knowledge, where knowledge sharing becomes spontaneous and where individual projects diffuse through each other and can be carried out thanks to the accumulated knowledge³⁶. Such a friendly network does not create barriers to entry/exit to/from the organisation, and to a high degree it is based on chaotic (at least apparently) processes, which as a result enhance its innovativeness. In such an organisation there are numerous integrators (orchestrators), who hold various key competences.

Summing up the considerations concerning the importance of humans and knowledge in the hyperarchical organisation, it should be noted that, to a high degree, self-regulating mechanisms occur. The key issue is to attract and maintain the appropriate people who hold various, complementary competences and create an appropriate technical infrastructure, which will ensure the possibility to exchange knowledge, ideas, and subsequently its accumulation and archiving within the organisation.

³⁴ Perechuda K., *op. cit.*, p. 143-144.

³⁵ *Ibid.*, p. 226.

³⁶ *Ibid.*, p. 58.

4. Tangible resources in the hyperarchical organisation

The technical infrastructure which facilitates the exchange of information and communication within the hyperarchical organisation constitutes one of the key tangible resources in the organisation³⁷. The appropriate selection of infrastructure can lead to a change in quality and accelerate interactions within the community³⁸. The appropriate infrastructure enabling for the documentation and archiving of the activities carried out by the community secures the organisation, at least partially, in the case of loss of its precious members, thus loss of the knowledge³⁹.

The major pivot in technical infrastructure is the Internet⁴⁰. Technical infrastructure should ensure the community with various possibilities of communication with the use of all accessible solutions offered by the contemporary network, especially the mechanism related to the WEB 2.0 solutions, comprising two side communications, the possibility to edit the same document by two or more persons, exchange of ideas in real time between people scattered in various locations in the world. Typical solutions which are used by hyperarchical organisations comprise: on-line archives of past activities carried out by the community, which are accessible to all members, in the case of IT open source projects, the so called system of version control, used for group work on the source code of the project, mailing lists, discussion forums, web sites comprising the project documentation, useful information for the users, and possible files for download⁴¹. Tools that are of special importance for multiple projects comprise tools enabling for the simultaneous work of many people on the same documents, files, based on the wiki mechanisms⁴². The first wiki was created in 1995 by an IT programmer – Ward Cunningham⁴³. The name of this solution comes from the Hawaiian language and means “fast”. The wiki mechanism allows for parallel work on the same text by many persons editing the text – each person has the right to edit the text. The amendments are visible on the web site immediately after they have been entered. Simultaneously, the previous versions of the text are saved,

³⁷ Butler B., Sproull L., Kiesler S., Kraut R., Community effort in online groups: who does the work and why?, in: Weisband S., Atwater L. (ed.), *Leadership at a Distance*, 2002, date of access 2012-02-08, <http://web.archive.org/web/20040719160444/http://opensource.mit.edu/papers/butler.pdf>

³⁸ Kuo-Ming Chu, *op. cit.*, p. 288.

³⁹ Vujovic S., Ulhoi J. P., Online innovation: the case of open source software development, *European Journal of Innovation Management*, Vol. 11, Iss: 1, 2008, p. 147.

⁴⁰ *Ibid.*, p. 151.

⁴¹ *Ibid.*, p. 151.

⁴² Tay Pei Lyn Grace, Wikis as a knowledge management tool, *Journal of Knowledge Management*, Vol. 13, Iss: 4, 2009, pp. 64–74.

⁴³ Shirky C., *Here Comes Everybody: The Power of Organizing Without Organizations*, Penguin, 2008, p. 111.

which allows for restoring the previous text, if the entered amendments turn out to be inadequate. These tools are crucial for many projects, of which the most important and the biggest so far is Wikipedia. The list of solutions dedicated to specific communities is supplemented with publicly available mechanisms, such as social networks, news websites.

Software mechanisms often require hardware infrastructure, especially internet servers, disc space, etc. In multiple cases, hardware infrastructure is owned by external service providers, however, bigger projects (e.g. Wikipedia) may need such a highly developed hardware infrastructure that their rental becomes non profitable or impossible. Nevertheless, this emphasises the need for gathering funds, at least, by some hyperarchical organisations⁴⁴. A certain solution to this problem can be the possibility to set up a hyperarchical organisation by traditional organisations, which are interested in the outcome of the projects undertaken by hyperarchical organisations. Traditional organisations, participate in the incorporation of the hyperarchical organisation by providing technical infrastructure, paying for activities carried out by their employees assigned to the activities conducted by the organisation or by providing financial contribution as the project sponsors. Examples of such activities comprise activities undertaken by Red Hat, which earned profits on the distribution of the Linux system⁴⁵.

In some hyperarchical organisations the technical infrastructure can be, at least partially, provided by the community members. An example that can be cited here is the SETI@home project, initiated by California University in Berkeley, which is about searching for civilisations living outside Earth by the analysis of radio signals. This analysis is conducted by over 150 000 project members (from various countries all over the world, including Poland), which provide free calculation potential of their computers and as a result generate the calculation potential, which is incomparable with any single computer available in the world⁴⁶.

Financial resources, if needed by the community, are used for the maintenance of technical infrastructure and the carrying out of day-to-day activities (e.g. meetings of the community members), promoting the organisation's activities, but also, as mentioned in preceding paragraphs, remuneration for certain members. The financial resources can come from donations granted by traditional organisations interested in the results of activities carried out by the hyperarchical organisation, but also donations of individual sponsors or members involved in the project work. In relation to this phenomenon, a new definition has

⁴⁴ Goldman R., Gabriel R. P., *op. cit.*, p. 38.

⁴⁵ *Ibid.*, p. 48.

⁴⁶ SETI@home, Wikipedia, date of access 2012-02-10, <http://en.wikipedia.org/wiki/SETI@home>

emerged recently, *crowd-funding*, which means the financing and co-financing of the projects (innovations, artistic projects) by internet communities⁴⁷. There are dedicated internet portals which connect the initiatives with groups of potential sponsors, such as: SellaBand, Trampoline, and Kapipal. A perfect example of such an initiative is the Wikipedia and Wikimedia foundation, which manages Wikipedia. Such internet portals collect donations from sponsors, fans and users themselves⁴⁸.

5. Conclusions

To summarise the analysis presented in this paper, it should be emphasised that the key resource used by a hyperarchical organisation comprises of its members connected via a network and their knowledge, which enables the organisation to achieve its objectives. Tangible resources are necessary in order to obtain the knowledge of the members and they constitute only an auxiliary resource. Nevertheless, they should provide conditions for the unrestricted exchange of ideas and information, which is possible due to the Internet. The Internet connects into networks, people scattered all over the world and those people contribute their precious knowledge and competences to the organisation.

Hyperarchical organisations not so much maintain their own personnel but rather compete in the market to gain the attention of experts and their time, which is a unique resource. The decision about involvement in the activities carried out by the community is made exclusively by the experts, who devote their private, free time, engage in the projects carried out by the organisation, and above all, share their knowledge (which also brings in benefits to the specialists, as they have a possibility to broaden their knowledge). Additionally, the organisation can employ (by a formal agreement) members, who can support voluntary members. Remarkably, those are voluntary members that build up the power of the organisation. The capability to attain and maintain over a long time horizon new voluntary members seems to be the key issue concerning human resources management in a hyperarchical organisation. The fact that people in a hyperarchical organisation are often the free resource does not mean that this

⁴⁷ Ordanini A., Miceli L., Pizzetti M., Parasuraman A., Crowd-funding: transforming customers into investors through innovative service platforms, "Journal of Service Management", Vol. 22, Iss: 4, 2011, pp. 443-470.

⁴⁸ This situation also occurs in Poland, where Wikimedia Foundation is an organization of public use, on which tax payers can allocate 1% of the tax liability. Polish version of Wikipedia is the six largest version among all language versions, with respect to the number of articles (900 thousand – data from April 2012) – http://meta.wikimedia.org/wiki/List_of_Wikipedias, 2012-04-11.

resource is easy to utilise. Difficulty in managing people and their knowledge results in the fact that from the perspective of the resource based view of an organisation, the free and apparently accessible resource, can become the basis of unique competitive advantage of an organisation, in reality it can become a scarce resource⁴⁹.

The hyperarchical organisation becomes a space for the independent development of tacit knowledge, a space where various individual projects penetrate each other. The projects can be carried out due to the knowledge accumulated within an organisation. The organisation does not build barriers to entry/exit to/from the community, and to a high degree, it is based on a chaotic (at least apparently) process, which as a result enhances its innovativeness, although they create a threat for the cohesion of undertaken activities, limit the planning possibilities and directing the activities of such an organisation.

In the light of the above considerations, further research on activities carried out by hyperarchical organisations should focus on the possibilities of directing an organisation's activities and defining the means of managing such an organisation. Furthermore, it seems crucial to take into consideration the possibility of using certain mechanisms, implemented in a hyperarchical organisation, in various business models, including implementing such mechanisms in business models applied in more traditional hierarchical organisations.

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⁴⁹ Müller-Lietzkow J., Free Resources and the resource-based view, in: Dadam P., Reichert M. (ed.), GI Jahrestagung (2), GI, 2004, pp. 493–498.

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Paweł Wieprzowski*
Collegium of Management and Finance
Warsaw School of Economics

The Investment Results of the Chilean Pension Funds¹

1. Introduction

The article conducts the analysis of real and nominal rates of return on the Chilean pension funds in the years 1981–2010. The Chilean pension system was selected for analysis due to its long history. The system started to operate in 1981, which allows for the analysis of investment results in the long run (30 years), which is desirable in the case of pension funds research. Furthermore, at present it is the only country with a considerable number of old age pensioners who are already making use of the funds gathered in private pension funds². An additional argument in favour of the analysis of the Chilean system of pension insurance is the fact that the Polish old pension reform of 1999³ was modelled on it. The present study becomes even more important, in particular, in the context of pension reforms in a number of developed countries troubled with the deficit of their state pension systems⁴.

The analysis of the rates of return on the market of the AFP pension funds (*Administradoras de Fondos de Pensiones*) in Chile includes the years 1981–2010. Such a long period of time is recommendable as a part of the pension funds resources is invested on the securities exchanges, where prices fluctuate depending on the bear or bull markets. Thanks to this, it is possible to focus

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² Yermo J., The Performance of the Funded Pension Systems in Latin America, “World Bank Background Paper For Regional Study On Social Security Reform”, 1.01.2004, p. 17 (http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2004/11/16/000090341_20041116112123/Rendered/PDF/304900JYermo1RegionalAFPPerformance.pdf), downloaded on 14.02.2011.

³ Chłoń A., Góra M., Rutkowski M., Shaping Pension Reform in Poland: Security Through Diversity, “World Bank Social Protection Discussion Paper Series”, No. 9923, August 1999, p. 13.

⁴ Exemplary analysis of pension reforms in a number of European Union countries – cf.: A. G. Grech, Assessing the sustainability of pension reforms in Europe, Centre for Analysis of Social Exclusion, London School of Economics, CASE/140, September 2010.

on a few whole securities exchange cycles, which fully reflect the long-term investment horizon of the people paying pension premiums. It is well justified as the literature is dominated by the opinion that in the long run the rates of return on share instruments are higher than the rates of return on investment in debt (bonds and bills) despite a higher risk expressed by a higher fluctuation of rates of return⁵.

The thesis of the article is the statement that the Chilean AFP were able to achieve relatively high rates of both in real and nominal terms. The results were decisively better than the rates of exchange on potentially alternative investments.

The article is divided into three sections. The first part presents the methodological assumptions of the results analysis of the investment pension funds in Chile. It also indicates the sources of data, the way the research was conducted and a justification of the assumptions.

The second section includes the calculation results of the real and nominal rates of return on the AFP market. These values are respectively compared with the nominal and real rates of return on investment free of risk (interest of bank deposits in the years 1981–2008 and interest on state bonds in the last two years of the examined period). The analysis is extended by the cumulated nominal and real rates of return on pension funds and deposits.

The third section presents the results of the ratio analysis of selected pension funds in the years 2003–2010. In order to verify the thesis concerning the possibility of achieving the above average risk weighted investment results, the following ratios were used: the Sharpe alpha, the Treynor ratio and the Jensen alpha.

2. Research methodology

The analysis of rates of return on pension funds refers to the period from July 1981 to December 2010. Such a long time allowed for the inclusion of a few bull and bear markets, including the decline of 2007–2009. Thus, the results will fully reflect the investments from the perspective of pension fund participants, paying premiums for a number of years.

⁵ International Monetary Fund, Ageing and pension system reform: implications for financial markets and economic policies, September 2005 (<http://www.imf.org/external/np/g10/2005/pdf/092005.pdf>), p. 28, downloaded on 12.12.2010.

Although there are studies questioning a higher rate of return on shares than bonds in a long run, if the resulted are adjusted by the investment risk – cf.: UBS, Q- Series: Pension Fund Asset Allocation, “UBS Investment Research”, September 2003, pp. 13–16.

The analysis of the pension fund market profitability in Chile makes use of the data of the Pension Fund Supervision (*Superintendencia de Administradoras de Fondos de Pensiones* – SAFF). The period 1981–1998 is based on the available literature⁶. The rates of return in the years 1999–2000 are derived from PrimAmerica publications⁷, while the period of 2001–2010 is based on the SAFF website⁸. The rates are real, calculated for 31 December.

The nominal rates are calculated through the adjustment of real rates of return on pension funds in Chile by the Consumer Price Index (CPI). The data on inflation are derived from the World⁹. The CPI value in the years 2009–2010 has been downloaded from the website of the Banco Central de Chile¹⁰.

The alternative investment to premiums transferred to the capital pension system is the concept of investment of these funds into the bank deposits because of a similar desired level of investment risk¹¹. The research does not assume the investment into the state debt securities as an alternative method of low risk investment. It is not possible, as in the case of Chile, the data on the Treasury bonds interest referred to the period after 2002. Other researchers encountered a similar problem in the profitability of Chilean bonds¹². Therefore, the equivalent of a relatively safe investment in treasury securities in the years 1981–2008 assumed in the research is the interest on deposits paid by commercial banks on demand, time or savings deposits¹³. The data have been collected from the World Bank¹⁴. For the period of 2009–2010 there are no data concerning deposits, so their equivalent is the interest of the five-year bonds issued by the Banco Central de Chile. The data have been downloaded from the website of the Banco Central de Chile¹⁵.

The investment results were compared through the cumulated real and nominal rates of return generated by the AFP as well as rates of return on

⁶ Superintendency of Pension Funds Administrators, *The Chilean Pension System* (Third Edition), Superintendency of Pension Funds Administrators, Santiago de Chile, 1999, p. 151.

⁷ PrimAmerica Consultores, *Informe sistema de AFP*, Santiago de Chile, October 2000, p. 51.

⁸ <http://www.safp.cl/573/propertyvalue-1849.html>

⁹ <http://data.worldbank.org/country/chile>

¹⁰ <http://si3.bcentral.cl/Siete/secure/cuadros/arboles.aspx>

¹¹ In both pension fund investments and bank deposits there is a risk of loss: the loss in assets of pension funds or bank bankruptcy and recovery of only part of the deposit due to the state guarantee. Both investments are conservative, and consequently are characterised by a relatively low risk, which enables the comparison.

¹² Yermo J., *The Performance of...*, *op. cit.*, p. 16.

¹³ The world Bank defined the rate of interest on deposits presented in its statistics as follows: Deposit interest rate is the rate paid by commercial or similar banks for demand, time, or savings deposits.

¹⁴ <http://data.worldbank.org/country/chile>

¹⁵ <http://si3.bcentral.cl/Siete/secure/cuadros/arboles.aspx>

deposits in the examined period. The cumulated rates of return were calculated through the addition of unity to the rates of return and multiplying the obtained indices by each other. Thanks to this the cumulated rates of return on pension funds and rates of return on deposits were calculated. The analysis also includes the standard deviation of the examined rates in the years 1981–2010, which is the measure of investment risk¹⁶. Additionally, the calculation of average annual geometric nominal and real rates of return on pension funds and on deposits is presented¹⁷.

The second section of analysis of the capital pension system profitability was a ratio analysis of selected pension funds. The research refers to the period 2003–2010 due to the fact that in September 2002, every pension fund was obliged to introduce the division of their offers into 5 types of funds: very aggressive (type A), aggressive (B), moderate (C), conservative (D) and very conservative (E). The difference between the types resulted from the limitations concerning the maximum and minimum involvement in shares. Table 1 presents the investment limitations of the fund types in Chile.

Table 1. Minimum and maximum involvement in shares (in percentages of assets) of pension funds in Chile with reference to the types

Type A		Type B		Type C		Type D		Type E	
Min	Max								
40	80	25	60	15	40	5	20	-	-

Source: Superintendency of Pension Funds Administrators, The Chilean Pension System (Fourth Edition), Superintendency of Pension Funds Administrators, Santiago de Chile, 2003, p. 1.

The first ratio considered in the analysis is the Sharpe alpha. It allows for determining whether the fund has achieved the above average rate of return with a given investment risk level, which takes effect in the case of the positive value of this ratio¹⁸. The Sharpe alpha value is calculated on the basis of the formula:

$$AS_j = r_j - r_f - \left(\frac{r_m - r_f}{s_m} \right) \cdot s_j,$$

¹⁶ Jajuga K., Jajuga T., *Inwestycje, instrumenty finansowe, aktywa niefinansowe, ryzyko finansowe, inżynieria finansowa* (Investments, financial instruments, non-financial assets, financial risk, financial engineering), Wydawnictwo Naukowe PWN, 3rd revised edition, Warsaw 2006, p. 184.

¹⁷ In order to verify the thesis, geometric averages were used as they better reflect the change in the investment value in during the whole examined period, *Ibid*, p. 175.

¹⁸ Buczek S. B., *Efektywność informacyjna rynków akcji Teoria a rzeczywistość* (Stock market information efficiency. Theory and reality), Oficyna Wydawnicza SGH, Warsaw 2005, p. 168.

where:

r_j – rate of return on fund j ,

r_f – risk free rate of return,

r_m – rate of return on the synthetic index,

s_m – rate of return standard deviation on the synthetic index,

s_j – rate of return standard deviation on fund j .

Another ratio used in the analysis of rates of return on pension funds is the Treynor ratio. It allows for the elimination of the systematic risk connected with the changes in prices on the capital market in the assessment of results achieved by investors. The higher the value of this index, the better the portfolio management. The Treynor ratio value is calculated on the basis of the formula:

$$T_j = \frac{r_j - r_f}{\beta_j},$$

where the value of parameter β_j is determined by means of the formula:

$$\beta_j = \frac{\text{Cov}(r_j, r_m)}{\text{Var}(r_m)}.$$

When the value of coefficient β of a given portfolio is higher than 1, it means that its changes will be higher than 1% and the value of the stock market index will change by 1%. If β is equal to 1, it means that the value of the portfolio will change in the same way (in percentages) as the stock exchange index. If β is lower than 1, the portfolio value percentage changes will be lower than the changes on the stock exchange index.

The third ratio calculated to assess the pension funds investment results is the Jensen alpha. Its positive value indicates the above average rate of return achieved by the fund management¹⁹. It is calculated according to the formula:

$$AJ_j = r_j - r_f - \beta_j \cdot (r_m - r_f).$$

The interest on five year bonds issued by the Central Bank of Chile was considered as a risk free rate of return. In 2009 there were no data available on the issue of treasury bonds so the free risk rate was referred to the interest of euro bonds (US168863AP36) issued in that year by the Central Bank of Chile.

¹⁹ Jajuga K., Jajuga T., *Inwestycje, instrumenty finansowe (Investments, financial instruments..., op. cit., p. 258.*

The interest of treasury bonds in the years 2003–2008 and 2010 was downloaded from the website of the Central Bank of Sweden. The euro bonds interest is derived from the Bloomberg service²⁰.

In order to calculate the Sharpe alpha and the Teynor ratio it was necessary to create a synthetic index of reference to compare the results. In the literature the reference index is usually the stock market index, however, it is best to create a synthetic index whose structure corresponds to the structure of assets of a given fund²¹. Such an index may be created by weighting the rate of exchange on the stock exchange index IGPA (*Índice General de Precios de Acciones*) and bonds issued by the Chilean central bank. The weights of asset types should reflect the structure of investment of a given fund. The literature indicates that the best solution is the assumption of weight for the share part of assets equal to the maximum permissible involvement in shares²². This study has achieved that. The weights for the individual types of funds are shown in Table 12.

Table 2. The weights of shares and bonds in different types of funds in the conducted study

Type A		Type B		Type C		Type D	
Share weight	Bond weight						
80%	20%	60%	40%	40%	60%	20%	80%

Source: own study

The hypothesis of information efficiency of financial markets negates the possibility of achieving the above average rates of return by investors in the long run²³. The verification of the third thesis on the possibility of achieving the above average rate of return with reference to a given level of investment risk will consist in the calculation of the Sharpe alpha, the Treynor ratio and the Jensen alpha for the four types of funds (A, B, C, D): Cuprum, Habitat, Planvital and Provida. The examination covers the period 2003–2010 and considers only those funds which indicated real rates of return in all these years. The value of the conducted analysis results from the full stock exchange cycle (bull market 2003 – July 2007, bear market: August 2007 – February 2009 and bull market: March 2009 – December 2010).

²⁰ www.bloomberg.com

²¹ Buczek S. B., Efektywność informacyjna rynków (Information efficiency of markets..., *op. cit.*, p. 168.

²² *Ibid.*, p. 168.

²³ Fama E. F., Market efficiency, long-term results, and behavioral finance, "Journal of Financial Economics", 1998, No. 49, pp. 288–289 and Sławiński A., Rynki finansowe (Financial markets), PWE, Warsaw 2006, p. 45.

3. Pension funds rates of return (1981–2010)

The problem of the level of rates of return from the Chilean funds has already been discussed in the literature. The calculations did not include the crisis on the financial markets in the years 2007–2009, when these companies' assets declined by several dozen per cent, which affected their average rate of return. For the years 1982–2007 the real rate of return, calculated as a geometric average of the rates of return in the particular years, amounted to 9.5%²⁴. This chapter presents the analysis of rates of return on the Chilean pension funds considering the crisis on the financial markets in 2007–2009 (see Table 3).

Table 3. Real and nominal rates of return on pension funds and rates of return on bank deposits in the years 1981–2010 in Chile

Year	Real rate of return on funds (in percentages)	Nominal rate of return on funds (in percentages)	Real deposit rate (in percentages)	Nominal deposit rate (in percentages)
1981*	6.2	16.2	10.1	20.5
1982	28.5	41.2	35.3	48.7
1983	21.3	54.4	0.5	28.0
1984	3.6	24.2	6.4	27.6
1985	13.4	46.9	2.0	32.1
1986	12.3	35.4	-1.3	19.0
1987	5.4	26.4	4.5	25.3
1988	6.5	22.2	0.4	15.2
1989	6.9	25.1	9.2	27.8
1990	15.6	45.7	11.3	40.3
1991	29.7	58.0	0.4	22.3
1992	3.0	18.9	2.5	18.3
1993	16.2	31.0	4.9	18.2
1994	18.2	31.7	3.3	15.1
1995	-2.5	5.5	5.1	13.7
1996	3.5	11.2	5.7	13.5
1997	4.7	11.1	5.6	12.0
1998	-1.1	3.9	9.3	14.9
1999	16.3	20.1	5.1	8.6
2000	6.5	10.5	5.2	9.2
2001	10.7	14.7	2.5	6.2

²⁴ Antolin P, Pension Fund Performance, "OECD Working Papers on Insurance and Private Pensions", No. 20, August 2008, p. 9.

continued Table 3

Year	Real rate of return on funds (in percentages)	Nominal rate of return on funds (in percentages)	Real deposit rate (in percentages)	Nominal deposit rate (in percentages)
2002	1.7	4.2	1.3	3.8
2003	11.9	15.0	-0.1	2.7
2004	9.1	10.3	0.8	1.9
2005	5.7	9.0	0.8	3.9
2006	17.1	21.1	1.6	5.1
2007	6.5	11.2	1.1	5.6
2008	-21.9	-15.1	-1.1	7.5
2009	27.9	30.0	3.5	5.3
2010	9.9	12.7	2.7	5.3

* for the period July–December 1981.

Source: in relation to the real rate of return on pension funds in the years 1981–2000 (Superintendency of Pension Funds Administrators, *The Chilean Pension*, *op. cit.*, p. 151); data from 1998–2000 on the basis of: PrimAmerica Consultores, *Informe sistema de AFP*, Santiago de Chile, Octubre 2000, p. 51; based on Kołodziejczyk, *Systemy emerytalne...* (Pension systems), *op. cit.*, p. 85); data from 2001–2010 own calculations on the basis of SFP reports from the website of the Superintendencia de Administradoras de Fondos de Pensiones [<http://www.safp.cl/573/propertyvalue-1849.html>]. For the nominal deposit rates and inflation in the years 1981–2008, The World Bank data [<http://data.worldbank.org/country/chile>]. For the nominal rates of the five year bonds and inflation in the years 2009–2010, data Bank of Chile.

The period in which the real rates of return were the highest was the 1980's. The average for the first decade (1981–1990) of the operation of the capital pension system in Chile amounted to 11.7%. It was connected with the favourable period of a quick rate of growth between 1985–1995. As a result of this, the value of assets on the Chilean capital market grew quickly²⁵. An additional factor in favour of achieving high rates of return was the low level of development of the Chilean financial market. As a result of this, a large demand on the part of pension funds made the financial instruments grow fast²⁶.

The rates of return were particularly high in 1982 (the rate at the level of 28.5%) and 1983 (rate of 21.3%). It was connected with high interest rates in the

²⁵ Edwards S., *Chile Radical Change towards a Funded System*, in: Siebert H. ed., *Redesigning Social Security*, Institut für Weltwirtschaft an der Universität Kiel, Mohr Siebeck, Tübingen, 1998, based on Kołodziejczyk K., *Systemy emerytalne w Ameryce Łacińskiej: od repartycji do kapitalizacji* (Pension systems in Latin America: from repartition to capitalization), Wydawnictwo Wyższej Szkoły Bankowej, Poznań 2004, p. 85.

²⁶ Barrientos A., *Pension Reform in Latin America*, Ashgate, Aldershot 1998, p. 119.

Chilean economy paid by the Chilean government and nationalised banks²⁷. Also pension funds managers invested all funds in debt instruments and deposits²⁸.

Another year with such a high rate of return was 1991 (29.7%). In that year the reason for such high profits was the foreign investors' interest in the Chilean companies whose share prices on the stock market doubled during the last 12 months²⁹.

The level of the rates of return on the Chilean funds was favourably affected by the investments in bonds of permanent gain in the period of high interest rates in the years 1985–1991. Another factor, which accounted for about 40% of the rate of return in the years 1985–1991 was the rise in share value of two domestic energy companies³⁰. During the discussed years (1981–1990) the average geometric real rate of return on deposits amounted to 7.4%, which means that it was by 4.3 percentage points lower than the rate of return on pension funds.

It is worth noting that the development of the Chilean economy and the rates of return on the Chilean funds were positively affected favourable tendencies in the world trade in the middle of the 1980's and at the beginning of the 1990's. In the years 1986–1990 the copper prices rose and remained at a relatively high level in the years 1991–1996³¹.

In the following two decades: 1991–2000 and 2001–2010 the average real rates of return rose respectively – 9% and 7.1%. The reduction of the average rates of return took effect despite the increased possibilities of diversification of the fund portfolio of pension funds in the years 1990–2002³². This means that in the future such high rates of return as in the first decade of the operation of the capital system is very unlikely³³. A similar conclusion was presented in the

²⁷ Mittelstaedt H. F., Olsen J. C., *An empirical analysis of the investment performance of the Chilean pension system*, Cambridge University Press, March 2003, p. 8.

²⁸ *Ibid.*, p. 15.

²⁹ *Ibid.*, p. 8.

³⁰ Kołodziejczyk K., *Systemy Emerytalne... (Pension Systems...), op. cit.*, p. 86.

³¹ Łyniewska A., *Dlaczego Wenezuela stała w miejscu, kiedy Chile szybko się rozwijało? (Why was Venezuela motionless, while Chile developed fast?)*, in: L. Balcerowicz, A. Rzońca, *Zagadki wzrostu gospodarczego: Siły napędowe i kryzysy – analiza porównawcza (Mysteries of economic growth: Driving forces and crises – comparative analysis)*, Akademia Oeconomicus, C.H. Beck, Warsaw 2010, p. 211.

³² In 1990 the Chilean pension funds were allowed to invest in foreign company's shares, and in 1993 in infrastructural funds and venture capital, cf. Vittas D., *Pension Funds and Capital Markets, Investment regulation, financial innovation, and governance*, World Bank Note No. 71, February 1996, p. 2.

³³ An additional factor hindering the repetition of such high rates in the future is the process of ageing of societies, in particular the retirement of baby boomers, i.e. people born in between the late 1940's and the early 1960's. The result of this demographic process will be a higher pace of consumption of the cumulated capital in the pension funds than the growth on account of saving by the working age people. The estimates with reference to the German economy indicate the lowering of the rate of domestic savings by about 9.2 percentage points and the a lower rate of

literature on the basis of the analysis of the rate of return of the Chilean funds in the years 1981–2000³⁴. Diamond and Valdes-Prieto³⁵ point to a low probability of the repetition of the AFP investment results from the 1980's and the early 1990's. They suggest that the Chilean pension funds should earn an average real rate of return at the level of 7% in the long run.

Nevertheless, there was a decline in the average real rates of return on deposits. in the years 1991–2000 and 2001–2010. They amounted to 4.7% and 1.3% respectively. This means that in all decades the average real rates of return on pension funds were higher than the average real deposits rates.

Table 4. The comparison of the results of pension funds and bank deposits in the years 1981–2010

Cumulated real rate of return of pension funds (1981 = 1)	14.32
Cumulated nominal rate of return on pension funds (1981 = 1)	283.87
Cumulated real deposit rate (1981 = 1)	3.69
Cumulated nominal deposit rate (1981 = 1)	73.15
The relation of the cumulated nominal rate of return on funds to the cumulated nominal deposit rate	3.88
The relation of the cumulated real rate of return on funds to the cumulated real deposit rate	3.88
Average annual geometric real rate of return on funds (in percentages)	9.44
Average annual geometric nominal rate of return on funds (in percentages)	21.10
Average annual geometric real deposit rate (in %)	4.52
Average annual geometric nominal deposit rate (in %)	15.66
Standard deviation of the real rate of return on pension funds	10.25
Standard deviation of the nominal rate of return on pension funds	16.25
Standard deviation of the real rate of deposit interest	6.68
Standard deviation of the nominal rate of deposit interest	11.64
Relation of geometric real rate of return on pension funds to the standard deviation of real rates of return	0.92
Relation of geometric real rate of deposit interest to the standard deviation of real rates of deposit interest	0.68

Source: own calculations on the basis of the data in Table 2.

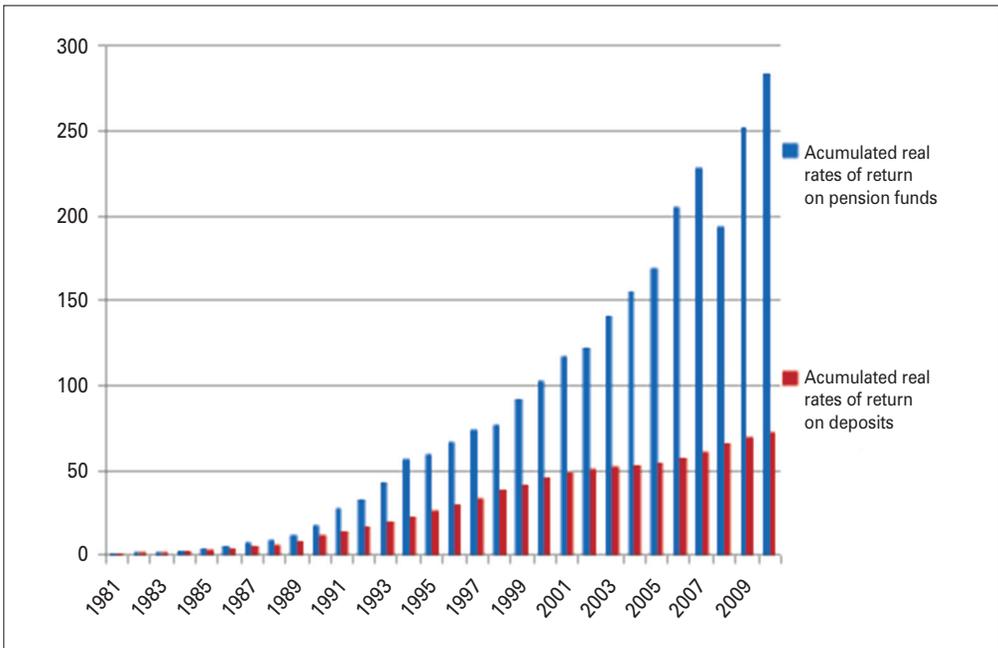
return on capital by 0.7 percentage point in 2050, Boersch – Supan A., Heiss F., Ludwig A., Winter J., Pension reform, capital markets, and the rate of return, “Mannheim Research Institute for the Economics of Aging (MEA) Discussion Paper Series”, No. 02023, May 2002, p. 3.

³⁴ Kołodziejczyk K., Systemy emerytalne... (Pension systems...), *op. cit.*, p. 86.

³⁵ Diamond P., Valdes-Prieto S., Social Security reforms, in: Bosworth B., Dornbusch R., Laban R. (ed.), The Chilean Economy – Policy Lessons and Challenges, Washington DC 1994, The Brookings Institution., p. 300.

As indicated in Table 4, the real cumulated rate of return on pension funds is nearly four times higher than the real and nominal cumulated rates of return on deposits (compare Table 1, Table 2, Figure 1). In the case of comparison of the average geometric real rates of return the difference is double in favour of pension funds.

Figure 1. Cumulated real rates of return on pension funds and deposits in the years 1981–2010 (July 1981 – value = 1)³⁶



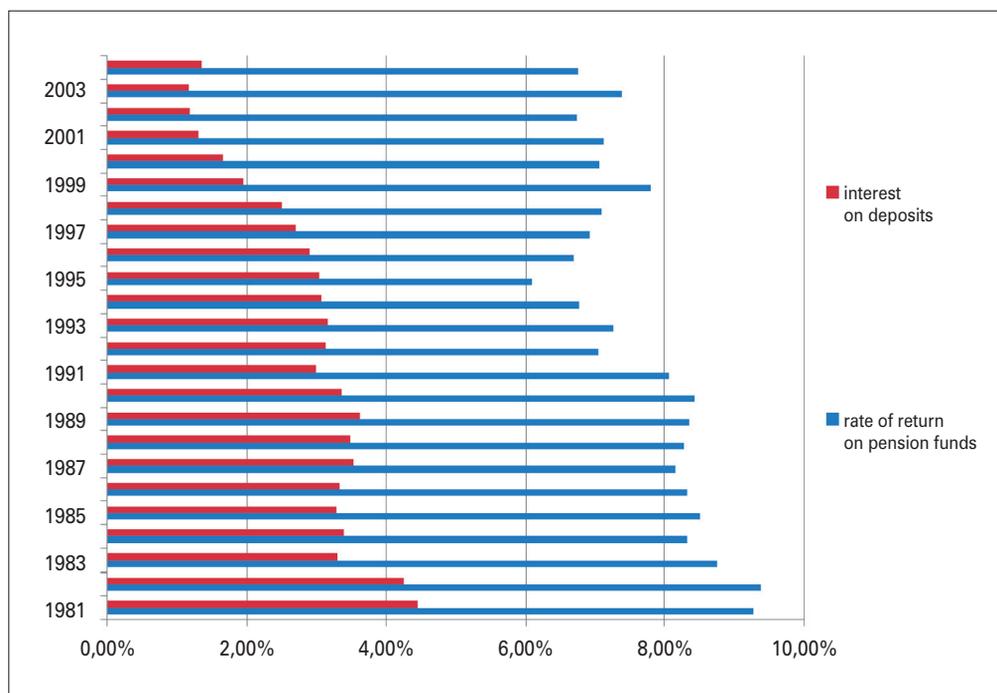
Source: own materials on the basis of data in Table 2.

However, it is worth emphasising that higher rates on pension funds are burdened with a higher variability than in the case of deposits interest. Nevertheless, a relative level of profit to risk (relation of real geometric rate of return on pension funds/deposits to the standard deviation of real rate of return on funds/deposits) were lower in the case of the pension funds market (0.92) than deposits (0.68). This means that, taking into account the criterion of the adjusted risk by the level of investment risk, it is more effective to invest in pension funds as one unit of risk in the case of pension funds corresponded to 0.92 of profit unit, whereas in the case of deposits it was 0.62.

³⁶ Cumulated real rates of return on pension funds and deposits calculated by adding to the annual rates of return of 1 and them to the and multiplying the indices obtained in this way by each other.

It does not mean however, that the fourfold larger cumulated rate of return on the pension funds in Chile referred to every old age pensioner³⁷. The retirement moment and premium transfer period were crucial for the investment result. For example, the survey of the sample of 6,000 pensioners in Chile indicated that people who, having retired, began to transfer premiums at the beginning of the 1980's, achieved the rate of return at the level of 81%, while people receiving pensions from the old system achieved the ratio of 73%. It was, first of all, connected with high real rates of return from the 1980's³⁸.

Figure 2. Average real rates of return for cohorts beginning saving in a given year calculated for December 2010³⁹



Source: own calculations on the basis of the SAFP data.

³⁷ It is necessary to differentiate the rate of return on pension funds, which is a result of investment made by them from the replacement rate, which is the relation of the first gross (net) pension to the last gross (net) pay, depending on the accepted convention. The replacement rate within the pension capital system is also affected by the following factors: the amount of premium transferred, the period on investment in pension funds and the retirement age.

³⁸ Yermo J., *The Performance of the Funded...*, *op. cit.*, p. 17.

³⁹ The analysis ignores the rates of return calculated for cohorts of 2005–2010. It is connected with the fact that they are average rates for only several years, which does not reflect a real, long-term investment horizon of pension funds.

A higher variability of rates of return achieved by pension funds may make the evaluation of the average real rate of return belong to the cohort composed of those beginning to save in a given year. It is connected with the fact that the differences between the rates of return from different cohorts may be substantial (Figure 2). For example, not taking into account the cohorts of 2005–2010, the highest average real rates of return were achieved by the cohorts of 1982 (the highest: 9.38%) and of 1995 (the lowest: 6.09%) amounted to 3.29 percentage points. The difference between the accumulated wealth of a pensioner from 1982 and 1995 cohorts will be larger depending on the length of saving and investing assuming that the calculated average rates of return are retained.

The differentiation of the average rates of return for particular cohorts is also reflected in the level of replacement rates for the pensioners in a given year. The retirement moment is also important. If the customers of pension funds who invest in shares retire after a financial crisis, their replacement rate may be considerably lower than it could be in the situation of retiring before the stock exchange decline.

The exemplary calculations of the replacement rate⁴⁰ in Chile indicate that the difference between the people who paid premiums for 20 years amount to 9.4 percentage points depending on the retirement before the crisis, i.e. before 2008 (the replacement rate of 46.2%) or after 2008 (36.8%). It is worth noting that the longer the period of premium transfer, the smaller the differences. For the pensioners who transferred premiums for 25 years the difference resulting from the retirement before 2008 (replacement rate of 53.9%) and after 2008 (47.8%) would amount to 6.1%. In the case of the transfer period of 30 years the difference would amount to 2.7%. This means that the longer premium period by one third would result in a threefold reduction in the difference in the replacement rates of pensioners who retired before and after the crisis.

4. AFP investment ratios

The research of the above average rate of return was conducted, among others, by Blake and Timmermann⁴¹. They examined the rates of return from over 2300

⁴⁰ It was assumed that the rate of replacement was calculated with reference to a bachelor earning a salary equal to the GDP per capita, which grows in real terms on the average 2% annually. The retirement age is 65, and the time of death amounts to 20 years plus the life expectancy of a person at the age of 20.

Forteza A., Ourens G., How much do Latin American pension programs promise to pay back?, "World Bank Social Protection Working Papers", No. 0927, 2009, p. 23.

⁴¹ Blake D., Timmermann A., The birth and death processes of mutual funds, "European Finance Review", 1998, Vol. 2, pp. 57–77, based on Tonks I., Performance Persistence of Pension-Funds Managers, "Journal of Business", September 2005, Vol. 78, No. 5, p. 1919.

mutual funds in Great Britain in the years 1972–1995. In the examined period, 973 funds stopped operating, with 1402 working on. The conclusion to be drawn from this research is the statistically indicated real rate of return lower than the average rate of return with a given level of risk. A similar conclusion was drawn by Ippolito and Turner⁴², who examined a sample of 1526 pension funds in the USA and proved that, on the average, they achieved a lower rate of return than the S&P 500 index rate of return.

Mixed results with reference to the possibility of achieving above average rates of return were obtained by Coggin, Fabozzi and Rahman⁴³. They analysed the rates of return in 71 pension funds in the USA in the period January 1983 to December 1990. They indicated that the fund which applied the value investing strategy⁴⁴ achieved the rate of return 2.1 percentage points higher than the benchmark, whereas the growth investing funds⁴⁵ achieved profits 0.96 lower than the reference rate.

The possibility of achieving the above average rates of return by the AFP was analysed by Mittelstaedt and Olsen⁴⁶. They indicated that in the initial period of the capital pension system (in the 1980's), pension fund managers continually achieved above average rates of return. The situation began to gradually change in the early 1990's, when the fund managers stopped being able to chronically achieve the above average rates of return, which is shown in Table 5. The value of the Sharpe ratio⁴⁷ was not negative until 1992.

⁴² Ippolito R. A., Turner J. A., Turnover, fees and pension plan performance, "Financial Analysts Journal", 1987, Vol. 43, pp. 16–26, cf.: Tonks I., Performance Persistence of..., *op. cit.*, p. 1919.

⁴³ Coggin T. D., Fabozzi F. J., Rahman S., The investment performance of US equity pension fund managers: An empirical investigation, "Journal of Finance", 1993, Vol. 48, pp. 1039–55, based on Tonks I., Performance Persistence of..., *op. cit.*, p. 1919.

⁴⁴ Value investing – investment strategy consisting in investment in companies which are evaluated with discount, i.e. below their intrinsic value. Such companies are characterised by low price to book value and price to profit ratios or high value of the dividend rate ratio.

⁴⁵ Growth investing – investment strategy assuming the investment in companies of above average growth potential, even though they are already highly evaluated (they have high price to book value and price to profit ratios or low value of the dividend rate ratio).

⁴⁶ Mittelstaedt H. F., Olsen J. C., An empirical analysis..., *op. cit.*

⁴⁷ The Sharpe ratio was calculated in this research according to the formula: $\frac{R_p - R_f}{\sigma_p}$, where: R_p – average real monthly rate of return of fund, R_f – average real rate of return on investment in short-term debt instruments, σ_p – standard deviation of monthly rate of return on fund. The negative value of the ratio means that the fund achieved a rate of return lower than the risk free rate of return. In the case of the positive value of the Sharpe ratio: the higher it is, the higher the rate of return above the risk free rate with a given level of risk was achieved by the fund. In the case of funds with the same rate of return, the fund with a higher value of the Sharpe ratio generates a given profit with a lower level of undertaken risk. This means that this fund is better which has a higher value of the Sharpe ratio as it generates a higher rate of return at a given level of risk.

Table 5. The Sharpe ratio for the AFP market in the years 1982–1997

Year	Number of AFP's	Sharpe ratio	
		average	median
1982	12	0.19	0.21
1983	12	0.89	0.91
1984	12	0.01	0.01
1985	11	0.70	0.70
1986	11	1.02	1.00
1987	12	0.21	0.21
1988	12	0.26	0.26
1989	12	0.15	0.17
1990	13	0.31	0.32
1991	13	0.82	0.80
1992	13	-0.03	-0.04
1993	11	0.46	0.46
1994	18	0.36	0.35
1995	16	-0.32	-0.32
1996	12	-0.21	-0.21
1997	13	-0.07	-0.07

Source: Mittelstaedt H. F., Olsen J. C., An empirical analysis..., *op. cit.*, p. 19.

All the examined type A funds achieved worse results than the synthetic index, with the risk considered. In all the cases, the Sharpe alpha and Jensen alpha ratios were negative. However, it does not mean that the funds did not raise the capital entrusted to them. The results presented in Table 6 indicate that the achieved results are not above average, considering the level of risk.

Table 6. Ratios of selected type A funds in the years 2003–2010

Fund	Sharpe alpha	Treynor ratio	Jensen alpha
Cuprum	-0.2861	0.0988	-0.0162
Habitat	-0.2828	0.1026	-0.0125
Planvital	-0.2840	0.1029	-0.0116
Provida	-0.2867	0.1006	-0.0145

Source: own materials.

In the case of type B funds the interpretation of results is similar to that with reference to type A funds. None of the examined funds achieved above average results (see Table 7). It should be emphasised that the Sharpe and Jensen alphas for type B funds were higher than those ratios for type A funds.

This means that their result was relatively better than type A funds. If, however, systematic risk was eliminated (Treynor ratio), type A funds achieved slightly better results.

Table 7. Ratios of selected type B funds in the years 2003–2010

Fund	Sharpe alpha	Treynor ratio	Jensen alpha
Cuprum	-0.0262	0.0896	-0.0210
Habitat	-0.0205	0.0982	-0.0089
Planvital	-0.0211	0.0987	-0.0064
Provida	-0.0283	0.0888	-0.0201

Source: own materials.

The funds of both type C and D achieved above average rates of return (positive Sharpe and Jensen alphas, see Table 8 and 9). Only in the case of the Provida fund, the interpretation of results may present certain difficulties: the funds of C and D type in this company had a positive Jensen alpha and a negative Sharpe alpha. Nevertheless, the value of the Sharpe ratio was very close to zero. Furthermore, it was the fund managing the largest assets among the examined funds⁴⁸, which may contribute to its relatively worse results⁴⁹. If systematic risk was eliminated, their results would not appear better than those achieved by type A and B funds. It may be concluded though that type C and D funds not only enlarged their customers' capital but also achieved above average rates of return with their risk profile.

Table 8. Ratios of selected type C funds in the years 2003–2010

Fund	Sharpe alpha	Treynor ratio	Jensen alpha
Cuprum	0.0034	0.0887	0.0238
Habitat	0.0076	0.0992	0.0293
Planvital	0.0077	0.1002	0.0289
Provida	-0.0018	0.0855	0.0201

Source: own materials.

⁴⁸ The average structure of assets examined in type C funds in the years 2003–2010 is as follows: Cuprum (23%), Habitat (32%), Planvital (5%) and Provida (40%). The average structure of assets of the examined type D funds in the years 2003–2010 is as follows: Cuprum (22%), Habitat (29%), Planvital (6%) oraz Provida (43%).

⁴⁹ It is easier to achieve better investment results while managing a small fund as the spectrum of potential investments does not involve only the shares of large companies but also small and medium-sized companies. As a consequence, the diversification of assets is better and eventually the achievement of a higher rate of return is more likely, cf.: Buczek S. B., *Efektywność informacyjna rynków... (Informative effectiveness of markets...), op. cit.*, p. 180.

Table 9. Ratios of selected type D funds in the years 2003–2010

Fund	Sharpe alpha	Treynor ratio	Jensen alpha
Cuprum	0.0305	0.0663	0.0156
Habitat	0.0098	0.0838	0.0252
Planvital	0.0002	0.0790	0.0159
Provida	-0.0027	0.0692	0.0118

Source: own materials.

Taking into account the types of funds (A, B, C and D) it may be stated that the more aggressive the fund, the smaller the chance of the fund to achieve the above average rate of return. However, it should be emphasised that this does not mean that the funds which invest aggressively achieve on the average higher rates of return than those more conservative. They may achieve higher nominal rates of return on the pension funds following conservative strategies, but after the adjustment by the level of undertaken risk the rates of return on pension funds of a more aggressive profile prove to be lower than those in the case of rates of return on investment with a lower level of risk.

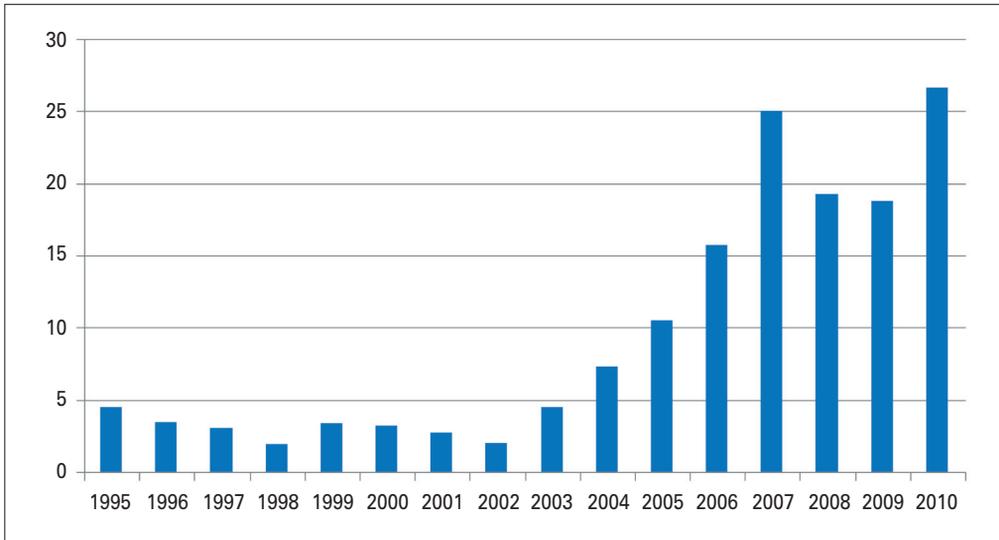
The differences in the possibilities of achieving the above average rates of return in the first and second decade of operation of the pension system in Chile (the 1980's and 90's) and difficulties to generate them in the years 2003–2010 may be connected with two factors. Firstly, the pension funds in the late 1980's acquired shares within the company privatisation programmes. These investments were characterised by a high concentration: 76% of the capital meant to be invested on the stock market was invested in 10 companies, some of which with a high rate of discount⁵⁰.

The second reason which partly explains the lack of possibility of frequent achievement of the above average rates of return by investors in the years 2003–2010, despite successes of this kind in the 1980's and in the early 1990's, is the dynamic development of the Chilean stock market beginning in 2003. As indicated in Figure 3, since 2003 the annual share trading has considerably risen. As a consequence the liquidity of the Chilean stock exchange has grown and it has become more effective from the informative perspective. This, in turn, reduced the probability of the above average rate of return⁵¹.

⁵⁰ Mittelstaedt H. F., Olsen J. C., An empirical analysis..., *op. cit.*, p. 20.

⁵¹ Sławiński A., Rynki finansowe... (Financial markets...), *op. cit.*, p. 49.

Figure 3. Value of the annual share trading on the Santiago Stock Exchange (in billions of Chilean pesos) in the years 1995–2010



Source: World Federation of Exchanges (<http://www.world-exchanges.org/>).

Another question is whether it is possible to retain the above average rates of return on selected pension funds in the future. The research conducted on the market of pension funds in Great Britain indicates that the managers who achieved the above average rates of return were able to repeat their achievements only within one year. It proved impossible⁵² in the period longer than one year. Furthermore, in a number of studies it was shown that those mutual fund managers who achieved results worse than the average rates of return also during the subsequent period did not succeed in generating a rate of return higher than the reference rate⁵³.

On the other hand, Bonilla, Romero-Meza and Gutierrez claim in their work that in the case of the Chilean financial market it is not possible to speak about full effectiveness⁵⁴. They proved that this market is not effective due to

⁵² Tonks I., Performance Persistence of..., *op. cit.*, pp. 1939–1940.

⁵³ Blake D., Timmermann A., The birth and death..., *op. cit.*, Allen D. E., Tan M. L., A test of the persistence in the performance of UK managed funds, "Journal of Business Finance and Accounting", Vol. 26, No. 5–6, June–July 1999, pp. 559–93, Fletcher J., Forbes D., An exploration of the persistence of UK unit trust performance, "Journal of Empirical Finance", 2002, Vol. 9, No. 5, pp. 475–96, Giles T., Wilsdon T., Worboys T., Performance persistence in UK equity funds: An empirical analysis, Report No. D03374-00, London 2002: Charles River Associates, based on Tonks, 2005, Performance Persistence of..., *op. cit.*, p. 1920.

⁵⁴ Bonilla C. A., Romero-Meza R., Gutierrez E., Nonlinear Behavior of the Chilean Capital Markets, Annual American Business Research Conference, 28–29 September 2009, New York, s. 10, downloaded on 27 August 2011, <http://www.wbiconpro.com/8.-Caludio.Chilepdf.pdf>

its weak form efficiency⁵⁵. They observed the ineffectiveness may be used only occasionally, i.e. this market is not effective in the weak-form efficiency in the short run.

The lack of above average rate of return on most of the examined Chilean pension funds is in accordance with the research presented in the literature. Furthermore, earlier research concerning the years 1982–1997 confirmed that the growth in the proportion of shares in the AFP assets (consequently of the risk portfolio measured through the standard deviation of rate of return) reduces the probability of the above average rate of return achieved by the pension fund managers⁵⁶.

5. Summary

The conducted research allows for the statement that pension funds in Chile were able to guarantee a real and nominal appreciation of the capital accumulated by their customers. In the period 1981–2010 the cumulated rate of return on pension funds was nearly four times higher than the cumulated rate of return on deposits in both real and nominal terms.

However, it should be noted that the AFP high rates of return achieved in the 1980's and 90's resulted from the one-time factors (privatisation and highly discounted purchase of state companies' shares, copper bull market, high GDP growth rate and high real coupon rates paid on state debt securities). This means that the average rates of return achieved by pension fund managers should be expected to decline in the long run.

The thesis on the possibility of achieving above average rates of return by pension funds was not confirmed with reference to all types of pension funds. The above average rates of return were achieved by the funds of the C and D type. The worse than average rates of return, with a given level of risk, were achieved by C and D type funds. This means that relatively better results than

⁵⁵ In research of information efficiency of financial markets Fama (cf.: Fama E. F., *Efficient Capital Markets: A Review of Empirical Work*, „Journal of Finance”, 1970, Vol. 25, No. 2, pp. 383–417) he formulated three kinds of efficiency. The first form is a weak-form efficiency, which assumes that on the basis historical data the managers are not able to achieve above average rate of return. In other words, this assumption means that using the technical analysis it is not possible to generate a rate of return higher than the average rate from the whole market. The second kind of efficiency is a semi-strong form efficiency, which negates the possibility of achievement of above average rate of return while using all the publicly available information. The third kind of efficiency is strong form efficiency. If the market is effective in the strong form, even the use of confidential information does not allow for the achievement of above average profit as this information is already reflected in the asset valuation.

⁵⁶ Mittelstaedt H. F., Olsen J. C., *An empirical analysis...*, *op. cit.*, p. 19.

the synthetic indices are achieved by the funds characterised by a higher level of conservatism in the field of investment (a relatively large part of assets invested in low risk instruments, i.e. bonds and deposits). Nevertheless, it was observed that the possibility of achieving above average rates of return systematically declines along with the growth in information efficiency of Chile's financial market.

In conclusion, Chilean pension funds were able to achieve relatively high average rates of return over a long period of time. Some funds also managed to achieve above average rates of return. These successes resulted from the coincidence of favourable factors whose repetition in the future is unlikely. Admittedly, it should be noted that in each of the three analysed decades (1981 – 2010), the AFP average real rates of return were higher than real rates of return on bank deposits.

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Summary

Edward I. Altman, Herbert Rijken

Toward A Bottom-Up Approach to Assessing Sovereign Default Risk: An Update

We propose a totally new approach toward assessing sovereign risk by examining rigorously the health and aggregate default risk of a nation's private corporate sector. Models such as our new Z-Metrics™ approach can be utilized to measure the median probability of default of the non-financial sector cumulatively for five years, both as an absolute measure of corporate risk vulnerability and a relative measure compared to other sovereigns and to the market's assessment via the now liquid credit-default-swap market. Specifically, we measure the default probabilities of listed corporate entities in nine European countries, and the U.S.A., as of 2009 and 2010. These periods coincide with the significant rise in concern with sovereign default risk in the Euro country sphere. We conclude that our corporate health index of the private sector measured at periods prior to the explicit recognition by most credit professionals, not only gave an effective early warning indicator but provided a mostly appropriate hierarchy of relative sovereign risk. Policy officials should, we believe, nurture, not penalize, the tax revenue paying and jobs generating private sector when considering austerity measures of distressed sovereigns.

Tomasz Cicirko

Methods of Increasing Bank Capital Effectiveness – part 2

The present study continues the author's deliberations on commercial bank capital management. These deliberations are included in the series of three closely related articles. The first section¹ is devoted to the presentation of the idea and classification of bank capitals. The second section refers to the modern effectiveness measures based on bank capitals. It presents the proposals of effectiveness measuring tools which can be used individually or may constitute the basis to construct an integrated effectiveness measurement model. The publication presents the model concept. The integrated effectiveness measurement model will allow for the acquisition of information on the profitability at the selected levels of bank organisational structures and will become a tool to steer the capital adequacy level. The concept NOPAT calculation for banking institutions is also presented.

Kenny Crossan and Thomas Henschel

A holistic model of governance for SMEs

The term corporate governance is now firmly part of modern business terminology and is widely used by commentators, businessmen and academics. However the exact

¹ See: T. Cicirko: Methods of increasing bank capital effectiveness – part 1, "Journal of Management and Financial Sciences", Volume II, SGH, October 2009.

meaning of corporate governance is still open to much debate, where on one hand some see it as a proxy for shareholder power, others see it as just a set of basic legal guidelines that large public limited companies have to follow, although not always in a manner that suggests that they actually believe in the value of such rules. However these definitions are not necessarily appropriate when we discuss corporate governance in relation to small and medium sized firms (SMEs). Indeed the idea of governance in SMEs remains an area that has not been widely researched. Many owners of SMEs may question the relevance of corporate governance to their business. However this to some extent is more to do with the language used rather than the underlying ideas of good governance, which can benefit all firms. This is due to the focus on 'corporate' and not governance within much of the debate in this area; there is no doubt that if we see governance as a holistic concept that is interested in fairness, responsibility, transparency and accountability then the relevance of SMEs becomes apparent.

The aim from this review of the governance literature is to demonstrate how we can move from the wider concept of corporate governance to the more narrow focus of governance that is relevant to SMEs, and to demonstrate how this idea of governance can be of practical value to the average decision makers within SMEs. Corporate governance has to be thought of in much broader terms than merely accountability and transparency. SMEs need strong support with the systematic implementation of corporate governance processes since generally they lack the necessary resources and the management knowledge to establish an effective corporate governance system. During this paper we explain how business planning, risk management, performance measurement and management behaviour form the basic building blocks for a governance system that is of practical benefit and use for SMEs. These four key features can be used to build up a heterogeneous governance system that should be useful to the firm in question and allow for better decision making and planning.

The findings from this review of the literature indicate that a corporate governance system is a necessity for SMEs, not only because it is required by law or by the Basel II regulations, but because it is in the interest of the SMEs. The reason is that such enterprises have a high potential to become insolvent and the most frequent causes of insolvency are management errors and weaknesses in the company structure. This is especially true during the first seven years following the establishment of the company. However the likelihood of failure should be reduced if appropriate governance systems are put into practice. The implementation of a well functioning, holistic governance model should allow the decision makers in SMEs to plan more effectively and manage their business in a manner that is more likely to secure the long term future of the firm.

Monika Czerwonka

The concept of socially responsible investing (SRI) in Poland

The concept of socially responsible investing (SRI) is commonly widespread in many European countries as well as in the United States. The socially responsible assets as well as the number of mutual socially responsible funds in the world are increasing (see: Eurosif 2010, Vigeo 2011, Report on Socially Responsible Investing in the United States 2010).

However the idea of SRI in such countries as Poland is still quite new and the market itself has little to offer in the field of socially responsible investment. The main

intention of this research was to explore the possibilities to develop the idea of SRI in business practice in Poland.

Poland is assumed to be a religious country with a high percentage of baptised citizens. Therefore the second goal of the research was to investigate if there is a potential for SRI development in Poland due to its religiosity. With a sample of 361 individual investors this study measures the impact of faith on one's willingness towards SRI. The results show that a practicing believer (so called "church goer") is more prone to invest in SRI funds.

Rafał Mrówka

Key resources in the hyperarchical organisation

This paper presents an analysis of resources used by a hyperarchical organisation – an organisation set up on the basis of a self-organising community clustered around a common goal-idea-project, communicating with its members via the Internet. The author's aim is to outline specific characteristics and the importance of resources used by hyperarchical organisations. The analysis focuses on the significance of members of a hyperarchical organisation and the knowledge, which they provide to the organisation. The author conducts an in-depth analysis of the knowledge management process occurring in a hyperarchical organisation. Furthermore, the author describes the specific nature and significance of human resources in a hyperarchical organisation.

Paweł Wieprzowski

The Investment Results of the Chilean Pension Funds

The article presents an analysis of the Chilean pension funds (AFP) rates of return in the years 1981–2010. The analysis of the Chilean pension system is essential for a few various reasons. It is the oldest capital pension system in the world, the basis on which the Polish pension reform of 1999 was modelled. Furthermore, the 30 year old history presents the AFP investment results in the long run, within a few business cycles, which is typical of pension investments. The research was conducted through the calculation and comparison of real and nominal, average and cumulated rates of return on the AFP and an alternative form of money allocation, i.e. bank deposits. Additionally, the research applied the Sharpe alphas, the Jensen alphas and the Treynor ratio in order to disclose if the pension funds management was able to achieve an above average rate of return taking into account the investment risk.

