Behavioural Finance for Private Banking

Thorsten Hens
and
Kremena Bachmann

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To Britta, Jerome and Annabelle,
as well as to Christoph and Vivien.

Contents

List of Figures

List of Tables

Notation

The following symbols are used in this book.

$ARA(.)$ absolute risk aversion
α^+, λ^+ risk aversion over gains
α^-, λ^- risk aversion over losses
α^i risk aversion parameter of investor i

b^g budget for goal g
β loss aversion

$c = 1, \ldots, C$ consequences
$CARA(.)$ constant absolute risk aversion
CE, X certainty equivalent
$const$ a constant
$\text{cov}_{k,j}$ covariance of the returns of asset $k = 1, \ldots, K$ and $j = 1, \ldots, J$
$CRRA(.)$ constant relative risk aversion

d return
$DARA(.)$ decreasing absolute risk aversion
$DRRA(.)$ decreasing relative risk aversion
δ exponential discount factor
δ^g relative importance of goal g
δ^g weight of goal g
Δx change in the realisations of a random variable x

e return
E_U expected utility

$F(c)$ cumulative distribution function F at some point c

$g = 1, \ldots, G$ investment goals
γ^+ probability weighting factor over gains
γ^- probability weighting factor over losses

h habit formation factor

$i = 1, \ldots, I$ investors
$IARA(.)$ increasing absolute risk aversion

i.i.d. independent and identically distributed
IRRA(.) increasing relative risk aversion

$j = 1, \ldots, J$ mental accounts

$k = 0, 1, \ldots, K$ (risky) assets
K^j subset of assets in mental account j
λ asset allocation
λ_0 portfolio weight of the risk-free asset
λ_k portfolio weight of asset k
λ^{opt} optimal asset allocation
λ_k^T assets weights in the tangent portfolio T
λ_k^g asset weight for asset k serving the goal g
L lottery

m return

μ expected value of a random variable
μ_λ expected return of a portfolio λ

p_i probability for consequence c_i
p_s probability for state s
P^n probability for a sequence of outcomes of order n
$p(.|.)$ conditional probability
$p(. \cap .)$ joint probability of events
PT_v expected prospect value
pt^+ average gain utility
pt^- average loss utility

R, r return
R_f risk-free return
R_s^k return of asset $k = 1, \ldots, K$ in state $s = 1, \ldots, S$
R_s^M return of the market portfolio M in state $s = 1, \ldots, S$
RRA(.) relative risk aversion
RP reference point

$s = 1, \ldots, S$ or $s = u, d$ states of nature
σ^2 variance of asset returns
σ_λ^2 variance of portfolio return λ

$t = 0, \ldots, T$ time period

$u(.)$ utility function; $u^i(.)$ utility of investor i
U^g utility from achieving goal g
$u'(.)$ first derivative of a function
$u''(.)$ second derivative of a function
u return

V mean-variance utility function
$v(.)$ value function; $v^i(.)$ value function of investor i

$w(p)$ probability weighting function
$w^*(p)$ normalized probability weighting function
$w(K^j)$ weight of mental account K^j
$\underline{w}$ minimum wealth or a 'safety first' constraint
w_s^g wealth in state s associated with the goal g
$\widetilde{w}_s^g$ state-dependent exogenous wealth
w_t wealth in period t

«Wir können sie jetzt nicht stören. - Sie sind mitten in der neuen Anlagestrategie!»

We can't bother them now – they are working on a new investment strategy!
Source: Felix Schaad in *Tages-Anzeiger*, 28.05.2004

Preface

Behavioural finance is an interdisciplinary research area that combines psychology and finance. It originated from decision theory – most notably the psychological traps that occur in making decisions under uncertainty. Private banking consists of a collection of services that banks offer on a more personal basis to wealthy investors. In particular, these services include investment advice given by relationship managers helping clients to achieve their financial goals without falling into psychological traps when investing their wealth on financial markets. Hence, behavioural finance is an appropriate framework to give private banking a scientific foundation.

The high wealth of private banking clients makes it possible to give tailor-made advice that best suits the risk ability, risk preference, and risk awareness of the client. Within the bank, the relationship manager has a key role in providing this important service to clients. He needs to have a good knowledge of both the financial markets and the individual client. While traditional finance with its cornerstones of mean-variance analysis, efficient market hypothesis, and derivative pricing has provided good models to understand the market, it is not appropriate for understanding clients. On the one hand, traditional finance has ignored behavioural biases so that the relationship manager is unable to understand many of the reactions his clients show in the course of making investments. On the other hand, traditional finance has focused on a simplified notion of risk – the variance – that is neither appropriate for most private investors nor leads to rational decisions when applied to modern assets like hedge funds or structured products. Hence, in order to provide the best service quality to their clients, most relationship managers need some knowledge of behavioural finance. Without this knowledge, relationship managers who are trained only in traditional finance would be left unprepared for their task to optimally position their clients on the trade-offs financial markets provide.

The purpose of this book is to close this gap by providing advisors of private clients with both the appropriate framework for their task as well as a collection of practical tools to support their work.[1] To achieve this goal we structure the book as follows.

After a brief introduction into the current challenges of the private banking industry, we go extensively into the foundations of behavioural finance: decision theory. Decision theory has three broad paradigms: expected utility theory, prospect theory, and mean-variance analysis. Expected utility theory clarifies which decisions are rational, prospect theory describes which decisions are most often observed, and mean-variance analysis is the best known decision model in practice. As we will show, in special cases like normally distributed returns, the three decision models coincide, but in general they are mutually distinct. In particular, it is possible that prospect theory decisions are rational while mean-variance decisions are irrational; i.e., the naïve classification "behavioural is equal to irrational" and "mean-variance is equal to rational" can be totally wrong.

[1] Please visit our webpage www.bfpb.ch to download the Excel tools created for this book.

Chapter 3 goes through the many psychological traps (behavioural biases) that are commonly observed along a typical decision-making process. In particular, we show how these biases differ across different cultures, which is of vital importance to any bank offering private banking services worldwide. Chapter 4 then shows how to integrate the insights achieved thus far into an important tool of highly practical relevance: a risk profiler. A risk profiler is a well-designed questionnaire that assesses the client's risk ability, risk preferences, and his risk awareness. Besides choosing the most appropriate questions, behavioural finance helps to evaluate the answers in a consistent way. In many countries, risk profilers are required by law. We see this regulatory requirement as a chance for any bank to improve the quality of its advisory process.

In Chapter 5 we analyze the colourful world of structured products, a business of increasing importance to many banks. We show how to evaluate structured products both from an expected utility theory perspective and from a prospect theory point of view. Moreover, we explain how to design structured, tailor-made products for private clients. After this, in Chapter 6, we go into the dynamics of investing. We show which investor will rebalance his portfolio during the course of investments and which one will take his profits or increase risks. Moreover, we give a foundation for common investment advice like the age rule, according to which the share of risky assets ought to increase with the investment horizon. In the following chapter we look at the life cycle investment problem. Besides the time horizon effect, the flow of exogenous income and the consumption needs influence the asset allocation over the life cycle. In particular, we study behavioural effects such as habit formation and hyperbolic discounting and how they influence clients' investing decisions.

The final chapter, Chapter 8, wraps up the main contents of the book in the form of the practical problem of wealth management. We show how a typical advisory process should be structured to make the best use of the services the bank can offer. Such a process needs to integrate personal asset-liability management, life cycle aspects, a risk profiler, a strategy implementation, and a well-suited documentation. In particular, we highlight the relevance of framing effects in documentation and the importance of mental accounting in advising clients how to invest their wealth optimally.

The style of the book is mixed. Besides intuitive written explanations, examples, and case studies, we also deepen the understanding by using some mathematics. Case studies and mathematics are highlighted in boxes. One can also understand the book on a more general level without going into these boxes. We hope that, in this way, this book is appropriate for a broader audience. Certainly the book is suitable for master classes both at business schools and universities in the primary studies, but it is also suitable for executive master programmes.[2] Independent of organized courses, our book can be used as self-study material to obtain a Behavioural Finance Upgrade for anyone trained in traditional finance.

Even though by now there are quite a few good books on behavioural finance – such as the two brilliant books by Hersh Shefrin, and also the two excellent books by James Montier in this series – our book is unique since it focuses more on client advisory than on asset pricing. This focus makes use of our comparative advantage of being in one of the world's first-class centres for private banking. Indeed, our book benefitted a lot from projects we have done for the former Bank Leu, Credit Suisse (CS), Union Bank of Switzerland (UBS), and Zürcher Kantonalbank (ZKB), to name just a few.

[2] Indeed, the content has been taught for many years at the Norwegian Business School (NHH) in Bergen, at the University of Zurich (UZH), and also at executive programmes of the Swiss Training Centre for Investment Professionals (AZEK), the Swiss Banking School (SBS), and now the Swiss Finance Institute (SFI).

Naturally, our book has some overlaps with other books on behavioural finance but the core ideas are based on our own research done in NCCR-Finrisk and the Research Priority Program Finance (RPPF) at the University of Zurich. We are indebted to our collaborators in these projects: foremost, Enrico De Giorgi, Marc Oliver Rieger, János Mayer, and Mei Wang. Moreover, we would like to thank the above-mentioned research networks, in particular their directors, Rajna Gibson and Marc Chesney, for intellectual as well as financial support. The generous support from NCCR-Finrisk was not obvious, given the focus of that network, which is more on traditional finance. We are grateful to the International Scientific Council of NCCR-Finrisk and to the Director of NCCR-Finrisk, Rajna Gibson, for their tolerance. Last but not least, we would like to express our gratitude to many people who provided advice and comments during the development of this book. Without the help of the editors of Wiley Finance, most notably Peter Baker and Aimée Dibbens, we would not have finalized this book. Moreover, the book benefitted greatly from comments from Peter Wüthrich, Doris Schönemann, Mila Winter, Christoph Bachmann, Nilüfer Caliskan, Martine Baumgartner, Martin Vlcek, Andreas Kamm, Philippe Martin, Richard Meier, Alfons Cortes, Thierry Bonnas and Amelie Brune. Finally, without the feedback from many students at the Norwegian business school (NHH), University of Zurich (UZH), Swiss Training Centre for Investment Professionals (AZEK), and Swiss Finance Institute (SFI), the book would not have reached its current level of pedagogical excellence.

Last but not least, we are indebted to our families, as writing a book puts an extra burden on our close relatives – a burden that is heavily under-weighted. Hence having written this book reveals that we are ourselves of the behavioural type described in our book – not always totally rational and also motivated by things other than money.

1 Introduction

In this chapter we summarize the current challenges in private banking and explain why wealth managers need behavioural finance. The concepts and insights suggesting how to transfer the research results into practical solutions are discussed in great detail in the rest of the book.

1.1 THE PRIVATE BANKING BUSINESS

Private banking offers exclusive wealth-related services to high net worth individuals.[1] The term "private" refers to the more personalized and exclusive nature of the offer as compared to the mass-market services accessible for other individuals such as retail clients and also as compared to services offered to institutional clients.

Private banking services can be offered by any financial intermediary whose main activity is the supply of exclusive financial and advisory services to wealthy private clients. Such financial intermediaries call themselves either "private banks" or they have a separate "private banking" or "wealth management" department serving the needs of wealthy private clients.

Case Study 1.1: Swiss private banking

Many financial institutes all over the world provide private banking services, but Swiss financial intermediaries have an indisputable leading position. Private banking has been a Swiss competence for more than 300 years. Today, almost one third of the international assets under management are with Swiss private banks, which makes the country the principle platform for private banking.[2] With 9 % of global assets under management, Switzerland is also the third largest wealth management centre in the world behind the US and the UK.[3]

Several factors contribute to Switzerland's emergence as a leader in private banking. The country is famous not only for its neutrality and economic stability, but also for its liberal capital markets. In particular, private banking in Switzerland has a long tradition of confidentiality related to the Swiss banker's professional duty of client privacy.[4] Its outstanding reputation is also supported by the tradition of high-end services and committed staff. In Switzerland, a "private banker" is not simply an expert in a private

[1] Although high net worth is not defined, it generally refers to individuals with net worth greater than $1 million.
[2] See www.swissprivatebankers.com.
[3] See www.swissprivatebankers.com.
[4] The Swiss banker's professional duty of client confidentiality is rooted in Article 47 of the Federal Law on Banks and Savings Banks, which came into force on 8 November 1934.

Case Study 1.1: (Continued)

bank or in a wealth management department of a universal bank. The term refers to a specific definition in the Swiss Banking Law. In the words of Alfred E. Sarasin,

> "A private banker is an entrepreneur in the privately-owned banking sector who conducts his business using his own assets, assuming unlimited liability with his entire fortune and exercising his independent power of decision."

The Swiss banking sector plays also a very important role for the Swiss economy. At the end of 2005, banking balance sheet assets totalled 2.8 trillion Swiss francs, corresponding to six times the GDP of the country[5] and wealth management alone accounts for more than half of the banks' value–added.[6]

The long tradition in private banking has an important role for the success of Swiss private banks. In a recent study Cocca and Geiger (2007) compare different private banks in Switzerland and 10 other countries.[7] They find that Swiss banks surpass foreign competitors in Switzerland in profitability (compare return-on-equity ratios, ROE) as well as in operational efficiency (compare cost/income ratios in Figure 1.1).

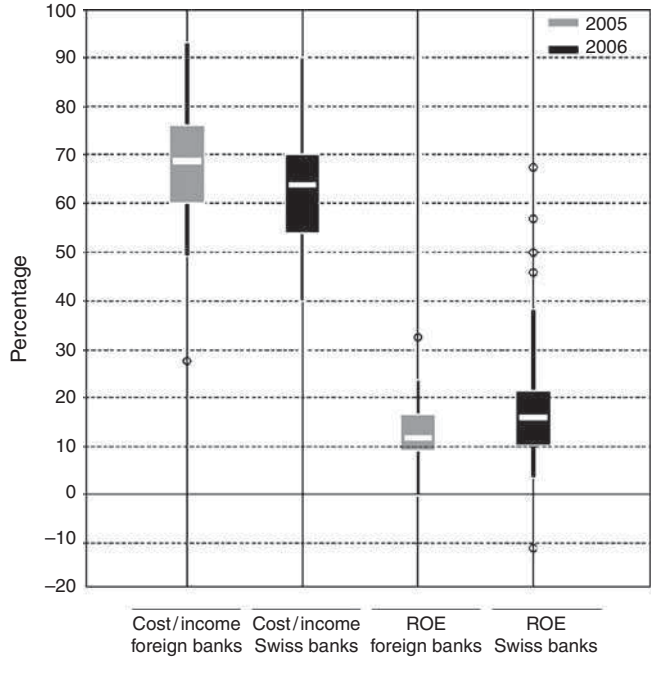

Figure 1.1 Efficiency and profitability of local and foreign banks in Switzerland

[5] See www.snb.ch.
[6] See www.swissprivatebankers.com.
[7] "The International Private Banking Study 2007" by Cocca, T.D. and H. Geiger is available at www.isb.uzh.ch.