



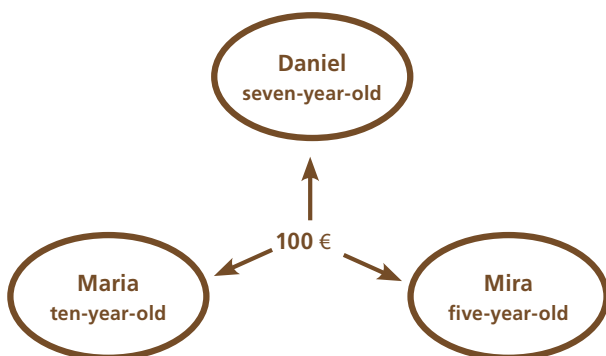
The Mystery of Investing: Befriending the Dilemma

What are my return expectations and how much risk am I willing to take to achieve them? This question is as old as investing itself. And we all know: Clarifying this question is at the beginning of every successful investment relationship. What we are hardly aware of: By clarifying this question the dilemma is only beginning. A different attitude and a different way of thinking provide new insights into this dilemma and how to cope with it – an approach which borrows from modern physics and psychology. Solutions are being developed which show how a stable and coherent relationship between the client and her investment advisor leads to joint investment success – how the dilemma of risk and return can initiate a fruitful dialog.

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Three friends looking for fairness

Mary is proud and happy. She got a 100 euro bill at the beginning of her fifth primary school year. She wants to share it fairly with her closest friends. Everyone should get the same. Already mathematically this is a big challenge.



But Mary tackles the task bravely and with great sense of responsibility for her age. She considers a rule: $100:3 = 33.33$. And who gets the residual cent?

But is this fair when all three kids get the same amount? Daniel, as a seven-year-old, already pays the full entry price for the zoo, Mira, however, gets in for half price. Hence, Mira can get twice as much with the same amount!

Mary remembers that her grandmother always says: With you the money is in good hands. You save or invest in your education! Now, Mary considers whether a larger share for her would be fair and in good hands.

Daniel, like Mary, is a very socially-minded child. He likes to share – also money. He would keep only a small portion for himself. The rest he would like to share with two kids from the neighborhood. But would they even accept his money?

Which is the fairest solution?

Daniel, Mary and Mira go around in circles. No solution appears to be really fair – a dilemma.

They put the money in a corner, call a few kids to play and have a fun afternoon.

And at the end, Mary takes the money and brings it to her mother: „Please look after it well until I’m grown-up, then I will know what is fair.“

About little and large investors, about investment advisors and (other) physicists

With a small sigh, dear reader, you may follow this little story and think to yourself: Mary's optimism is indeed encouraging - but will *grown-up* Mary really know what is fair?

Let us take Mary's place and embark on a small learning journey. Why is a fair distribution so difficult? Mary gives her mother the money for safekeeping. The problem of fair distribution of money among Mary's friends has now turned for her mother into the problem of the *right* distribution of 100 euros in the various forms of savings. And here, too, a distribution problem arises: Mary's mother does not know the distribution of the investment returns of the various forms of savings. What the chances are, to return more or less than 100 euros to Mary when she is grown-up. In order to make it possible for Mary to then resolve her original distribution problem.

That every distribution – be it a distribution among friends, be it a probability distribution or be it any other kind of distribution – is a fundamental dilemma, which presents us with imponderable alternatives, is at the center of this essay.

There are different ways to describe a dilemma. Most approaches start with describing a conflict of objectives, the existence of which is immediately evident to us. Here, however, we want to follow a slightly different path. A path that modern physics showed us for the strange world of the tiniest particles. We invite you to explore with us the world of quantum phenomena in order to fathom this dilemma.

Surprisingly, quantum phenomena also occur in our daily lives. With every small event we stumble upon these, without being aware of it. We would like to try to introduce you to this world. Don't worry you don't need to be a physicist to understand this, just to be open to a different, unusual kind of thinking.

Let us briefly outline the basic idea of this essay: Risk and return are complementary. Risk and return are terms from the world of investors. Ask an investment advisor – let us call her Alice – and she will try to explain it to you: „When an investor comes to me, it is important that I explain to her these two basic concepts. Most customers have pretty clear ideas of how much yield – or return – they want to achieve with their savings: 5% per year, for example. But they worry little about which risks they have to take in order to realize such a target return. I must first make this clear: Risk and return are very closely related. If I want more return I have to be able to take more risks. However, which kind of risk leads to the desired return is, initially, completely unclear. And, in order to gain a common understanding of risk, I must check with the client: Which investment shall be classified as risk-free? Most clients consider government bonds from the state to

which they pay their taxes risk-free. For some clients even government bonds are associated with high risks. With such customers I must then agree on a different risk-free anchor – for example cash. Once this anchor is agreed upon (for example German government bonds) then I can try, together with the customer, to find out what risks means to her. She can invest her money, without any risk, for the next year at 1% yield into German government bonds. If she wants more than 1% then she must take a certain, not precisely calculable, risk. If she wants, for example, 2% then she must go for a riskier investment strategy. In this case, after one year, her net wealth may have increased by 3% or, if the risk has had a negative effect, may even have decreased. There is a certain risk, but it is very hard to calculate.“

You may object: „Dear Alice, what you tell me here perhaps applies to small customers. But for large clients, for those with heaps of money, this does not apply, does it? Those clients can achieve much more return even without taking on more risks. Or at least they can calculate exactly the extra risk?“

Alice answers: „Once a new client who was really rich and who had very high demands came to me.“

„Now this gets exciting! How much money did this client have?“

„She had very much. Enough to be able to build many castles if she had wanted to.“

„And what kind of demands did this super rich client have?“

„She wanted to achieve more than 10% return per year, while limiting the volatility risk to 10% per year.“

„Now you caught me out: What do you mean by volatility risk?“

„I'm sorry! Of course I should have explained it before: Volatility risk is a statistical measure. Imagine the client keeping accounts of her annual returns, sometimes with higher returns and sometimes with lower ones. Then, volatility risk is the average range of fluctuations of these returns.“

„Oh, now I understand! But what did you do with your most demanding client? I imagine that her target of minimum 10% return on investment for maximum 10% risk was a huge challenge for you!“

„Indeed, it was an enormous challenge. But we tried it. After five years it turned out that we could in fact keep the volatility risk just below 10% per annum. However, the return target of 10% per year was too ambitious, even though we had worked together with the world's best investment professionals.“

„You could control the risk for your client but not the return?“

„That’s right. This was a lesson for me. I gave the customer two alternatives: Either we target an average return – for example 10% per year – but then we must be free to choose how much risk we want to take each year to achieve this. Or we aim for a given risk – for example, a volatility of 10% – but then we must live with the resulting return. We will no longer target both at the same time!“

„And your demanding client accepted this?“

„She did so quickly, due to the experience we had.“

„Which alternative did she choose?“

„She chose a specified risk target (10% annual volatility) and since then she’s been extremely satisfied with her mandate.“

„It is kind of strange“, you may answer, “that risk and return targets cannot be defined at the same time. After all, both are necessary in order to achieve an investment result?“

„Exactly, for an investment result, both are necessary: a risk taken and a return achieved. But, with the exception of our risk-free investment, we cannot define both targets in advance. Either we target a given return level, then we must reconsider every year, maybe even every day, what kind of risk we want to take for this. The risk is then undefined. Or we target a predefined risk level. Then we have to be satisfied with the return which can be achieved with this risk. The return becomes uncertain.“

Situations like these, as your fictional dialog with the investment advisor Alice shows, occur more frequently in our everyday lives than we think. **Very often two things which together form an entity cannot be precisely determined at the same time.** Yet another example from economics shall illustrate that the previously described situation is not at all extraordinary: A fisherwomen thinks about selling her catch on the market. She can either fix the price. In this case she doesn’t know how much of her fish will remain unsold at market close. Or she can insist upon selling the whole catch. Then she doesn’t know what price she will get for it. Here too: Two things – price and quantity – which together form a single entity – an exchange of goods for money – cannot be exactly determined at the same time.

Such uncertainty relations, as we see between risk and return, or between price and quantity, are also considered in modern physics. Physicists often deal with so-called complementary quantities, such as position and momentum of a particle, and also realize that these cannot be determined the same time.

Even if you are not an expert, and perhaps never have been interested in physics, a brief look at findings of this discipline can be well worth your while. If we apply these findings to the financial market we can better understand the uncertainties which we, as investors, face. Let us therefore turn to fundamental physics in order to return from there with a clearer view of our situation as investors.

Modern quantum physics often has to deal with complementary quantities. Imagine, for this purpose, a small particle in motion. In order for the particle to achieve an action, it passes through a distance driven by momentum. Complementary in this case firstly means: The action of the particle can be seen as the distance it passes through together with the momentum it has. The *complementary* quantities distance and momentum, in this sense, make up the complete action of the particle. This is almost self-explanatory and not very surprising. Only with the special insight of Werner Heisenberg, one of the most famous physicists of the 20th century, does the term *complementary* become surprising to us. Heisenberg would say: **We cannot precisely measure complementary quantities at the same time.** If we want to accurately measure the distance of an action the momentum becomes quite fussy. And vice versa: If we want to accurately measure the momentum of the action of such a small particle we lose knowledge of its location. Therefore, if we want to measure both, distance and momentum, some degree of uncertainty is inevitable. We only know *more or less* where the particle in action is and *more or less* what momentum it has. There is even a formula exactly bounding this necessary measure of uncertainty: the Heisenberg uncertainty principle.

$$\Delta x \times \Delta p \geq h$$

The uncertainty about the distance (Δx) and the momentum (Δp) of an action cannot be eliminated because of this very same uncertainty principle.

Now, Heisenberg would continue: We know exactly why this uncertainty occurs. Physical particles perform actions only in whole quanta, i.e. in packages of small action jumps. There is a minimal quantum of action (Planck’s constant) which cannot be divided further. These jumps generate the gaps in the observation which are responsible for the uncertainty in the measured physical quantities.

Ergo: Uncertainty is a fundamental part when measuring complementary quantities.

This is the way modern physics views complementary quantities. But let us come back to investing and to our fictional dialog with the investment expert Alice. Alice comes to the conclusion, together with you, that in investing a phenome-

non similar to that in quantum physics can be observed. Risk and return are the ingredients which are necessary in order to achieve an investment result. Yet somehow it seems that we are strangely challenged with our investments, that there is a dilemma attached to it. We can never control both quantities exactly at the same time – not even if we work with the best experts in the world.

If we wish to control a particular risk then we are completely uncertain about the return we can achieve with it. If, on the other hand, we want more certainty about the return to be achieved we become less certain about the risk we have to take for it. Certainty about risk and return seem to exclude one another.

How is it possible that investing exhibits such an amazing quantum phenomenon?

As we will see, we, very naturally, use for this purpose an uncertainty relation in the risk and return assessment which, time and again, presents us with a dilemma. We cannot resolve this dilemma. But as investors we can learn to cope with it in a fruitful way.

The dilemma of risk and return in the investment relationship

Imagine a typical investor. Let us call her Beatrice. Beatrice might be the mother of Mary. (Mary asked her mother to look after her savings until she is grown-up – and knows how to share fairly.) Beatrice is a customer of our investment advisor Alice. She has agreed with Alice on an investment objective and an appropriate investment strategy for her own assets and also for the savings of her daughter. She wants to generate 5% return per year in the long term. The investment strategy foresees that Alice and Beatrice meet annually in order to make potential adjustments in the portfolio of investments. Alice and Beatrice have agreed to adhere to the following rule: During the year the portfolio is not changed. The investment result is evaluated at the end of the year. The portfolio remains unchanged for the next year if the previous annual return lies within the range of +5% /-5%. We write:

$$\Delta_{return} = 10\%$$

In case the annual return lies outside this range of 0% to 10% Beatrice changes, together with Alice, the portfolio composition in an effort to bring the investment return back to the desired range.

After the first year, Beatrice is already very curious to meet Alice to discuss her annual result. She asks herself: How will it have turned out?

Beatrice begins to muse: This year's investment performance is important for me, but actually not only this one. I worry also about all future years. How often will the results, which I'll achieve with Alice, lie within the agreed target range? How will my investment results be distributed within the target range? Beatrice has to smile as she imagines herself a grey statistician, measuring meticulously the frequency of investment results on the target range. In a few years, Beatrice thinks again with a serious expression, most years' results should be between 0% and 10%. That should be possible. Alice was so optimistic in this respect last year. But what is the situation today? After only one year?

This question brings a smile to Beatrice's face once more, as she must think again of the grey-haired statistician: In a successful year the frequency of the investment results on the target range is as follows – if I can even talk about a frequency, as it involves only one result:

$$frequency^1 = \frac{1 \text{ investment result}}{10\%}$$

In case the result falls into this target range, the conversation will be easy, Beatrice thinks. She will be satisfied and expects Alice to propose only small adjustments to the portfolio, to which, Beatrice already knows now, that she will agree.

But what if the investment objective is not achieved this year?, she continues asking herself, if the investment outcome is outside of the target range of 0% to 10%?

If it were more than 10%, Beatrice begins to dream, I could live with it. Sure, I have to ask Alice whether we haven't taken too much risk and just have been lucky. Whether we were too speculative and now need to take the opportunity to align the portfolio more conservatively. But Beatrice would not more than gently remind Alice not to be so speculative in future. The strategy was indeed very successful.

But what if the investment result turns out to be negative?, Beatrice frowns, then something must be done in any case! Either Alice explains to me why this happened and shows me credibly how we can get out of the situation, or I will have to find another investment advisor.

For Beatrice there is no doubt: In this case I must take drastic action. Otherwise Alice feels that no rules apply to dealing with my money!

After a while doubts slip in her mind: Who can say in advance that I'm better off with another investment advisor?

¹ Mathematically interested readers may find the term *frequency* for this quantity somewhat misleading. Notions like *event density* or *result density* would be more precise expressions for this quantity.

Beatrice tries to suppress this question. Again, she imagines quite rationally and objectively the situation when the target is not met. Now, she no longer smiles at the imagination of her as a statistician. Beatrice cannot be satisfied with the investment result in either case: not if it is too high and not if it is too low, because the target was missed in both cases. In other words: The frequency of results on the target range is equal to zero:

$$frequency = 0$$

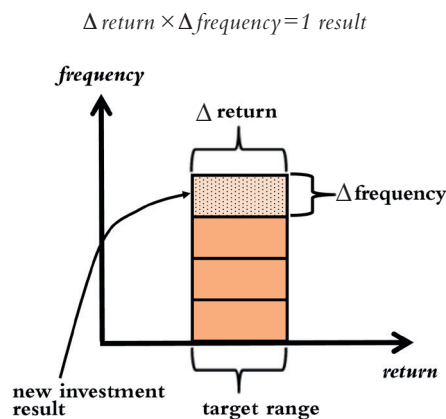
Beatrice remembers the successful case. There, the frequency on the target range was:

$$frequency = \frac{1 \text{ result}}{10\%} = \frac{1 \text{ result}}{\Delta \text{ return}}$$

Now she compares success and failure. She ends up with the following range of frequency on the target range of returns:

$$\Delta frequency = \frac{1 \text{ result}}{\Delta \text{ return}} - 0 = \frac{1 \text{ result}}{\Delta \text{ return}}$$

Or, written differently:



This is the basic dilemma which Beatrice faces at her annual evaluation: The uncertainty about the return of the investment strategy if successful, times the uncertainty about the success of the investment strategy (expressed in the uncertainty of the frequency of investment results on the target range) is equal to one unit of a single investment result. (Investment results are always indecomposable, irreducible units. There are no half or quarter results.)

Beatrice tries again to envision this strange dilemma. It is like bewitched, she thinks, if I impose narrow return guidelines it is because I want certainty in the yield. But then the uncertainty about the frequency of success is high. So I have uncertainty about the risk. And, on the other hand, if I impose very broad return guidelines, then I have high uncertainty in yield. For this I get a certainty in the frequency of success. Hence, certainty about risk. In short: **If I want certainty about return I get uncertainty about risk. If I**

get certainty about risk I have to deal with uncertainty about return. No matter how I look at it, I always have a drawback. Did Alice inform me about this adequately? Wouldn't I have chosen a different investment objective in that case? And anyway: How did I come to my investment objectives? Do I know my expectations well enough?

While Beatrice still daydreams, Alice, her investment advisor, is also preparing for their annual meeting. Alice realizes that this year's investment result is negative. She thinks to herself: Beatrice wants 5%. But she should know that certain variations can occur. Alice checks up the advisory agreement and there she sees Beatrice expects fluctuations between 0% and 10% in return. Is the investment result outside, the portfolio should be reviewed and adjusted. We are now in negative territory, so outside this range. Alice thinks: In order to achieve the long-term target of 5% in average, we should now increase the risk, thus sell less risky investments and buy those with higher risk. But the riskier assets are those which have fallen the most this past year. Will Beatrice not be afraid they could fall further next year? Will she be willing to buy them now? Alice once again checks the advisory agreement she made last year with Beatrice. It says that the client would be ready to do so. So, no problem!

Nevertheless, Alice has a *queasy feeling* before the annual meeting with Beatrice. Will she stick to this agreement? Or will she even withdraw her mandate?

Alice prepares for the meeting with Beatrice by going through all the possibilities in her mind how they could deal with the mandate. If Beatrice can live with the fact that this year's target has been missed then Alice will propose the more aggressive portfolio for next year, which Beatrice hopefully will be ready to implement. But if Beatrice is dissatisfied with the negative outcome, and not ready to take higher risks, then there would be another possibility. They could change the investment objective and adjust the mandate. The target range could be widened for example to the range between -5% and 15%. At the end of the next year, the uncertainty about the success of the investment strategy would then be

$$\Delta \text{ return} = 20\%$$

This larger uncertainty of success would then compensate for a lower range of the possible frequency on the target range. The uncertainty in the frequency on the target range would scale back from

$$\Delta \text{ frequency} = \frac{1 \text{ result}}{10\%}$$

to a new lower bandwidth of

$$\Delta \text{ frequency} = \frac{1 \text{ result}}{20\%}$$

Alice tries to formulate in her mind how she can explain this fact to Beatrice even more clearly: Look Beatrice! If we allow for a higher uncertainty in the return then we obtain a lower uncertainty in the frequency of investment results which we observe every year on our target range. Over the years, we can keep count of these frequencies, so that we get a distribution of annual results.

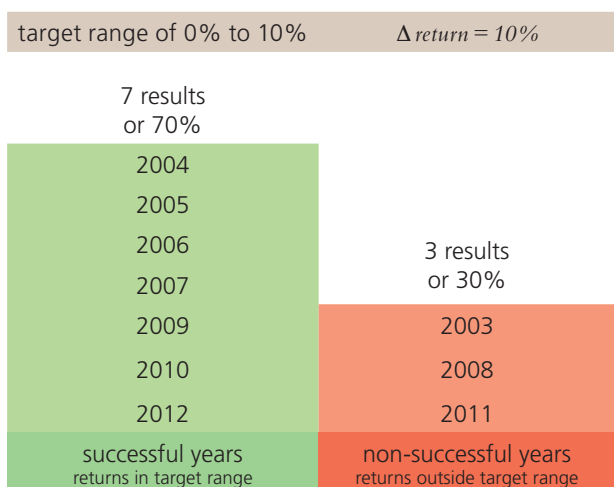
Alice imagines how she can illustrate to Beatrice the distribution of returns of her annual investment results on a sheet of paper.

year	annual return
2003	12.4%
2004	4.1%
2005	5.2%
2006	5.1%
2007	3.8%
2008	- 9.7%
2009	9.7%
2010	1.2%
2011	- 4.3%
2012	7.5%

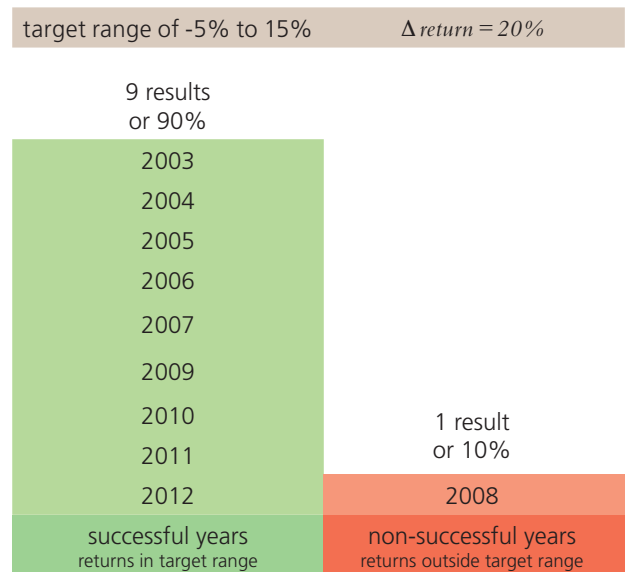
We can then distinguish between successful and unsuccessful years. The more we know about this distribution the less uncertainty about the risk we have. If we want to know very well the risk we are taking, then we must keep the uncertainty about the frequencies as small as possible – and, with it, the uncertainty about the distribution of the annual returns.

Alice imagines how she draws two different distributions on a piece of paper and points out the difference to Beatrice.

Distribution 1:



Distribution 2:



The uncertainty is small in the case where the target range is very wide. For this, too, Alice imagines a small drawing that she wants to show Beatrice. If we modify our agreement and double the width of the target range to -5% to 15% then the uncertainty about the success frequency will be halved for the next year. Thus, the uncertainty about our risk gets smaller. In this sense, in any new investment year, uncertainty about the risk times uncertainty about the return is constant.

$$\Delta return \cdot \Delta risk = 1 \text{ result}^2$$

Alice hopes to be able to clarify this fact, with the help of illustrative documents, to Beatrice during their upcoming meeting.

But something else remains a burning issue for Alice. Many changes to the advisory agreement have a negative impact, in the long term, on both uncertainties. If, for example, the target range of successful annual returns is changed to one half, from 10% to 5%, then this uncertainty of successful annual returns remains as low only in the case that it is not increased in later years. What sounds so simple has enormous consequences if you look at both target uncertainties together.

The product of both uncertainties becomes larger, the more often the advisory agreement is changed. The equal sign (=) becomes a greater-than sign (>). Both uncertainties, taken together, increase with the number of times the agreed objectives are changed:

$$\Delta return \times \Delta risk > 1 \text{ result}$$

² A mathematically precise version of this uncertainty relation could be formulated in [2]. This is a very general relationship of uncertainty between the variance of the event density and the variance of the position of a single statistical event.

Alice thinks that it could be difficult to convince Beatrice not to change the advisory agreement, especially in the years in which the result has fallen below the target range. Alice therefore tries to come up with additional arguments how she could persuade Beatrice, knowing how difficult this is.

With a sigh she says to herself: Indeed the dilemma of risk and return cannot be put out of force.

Risk and return are complementary.

Let us summarize. Or, to put in in more precise terms, let us add together, all the individual steps Beatrice and Alice take together to a single whole – to a complete advisory relationship. Let us string together all the steps, that Beatrice and Alice take. From the first investment made, to the first annual assessment meeting, to the second one, to the third, to the fourth and so on. Until Beatrice wants her money back in order to return it, for example, to Mary who is now grown-up. Or until the advisory relationship is dissolved. What is the uncertainty for the entire advisory relationship?

If Beatrice and Alice want to ensure a specific average annual yield in the long term, a yield which is higher than the risk-free interest rate, then they want certainty for the long-term return. If this return is far above the risk-free interest rate then the uncertainty about the risk is virtually unlimited. The uncertainty of being forced to make high adjustments to the portfolio each year is high. If a year is negative the risk must be increased in the next year in order to compensate for the loss. With the risk that in the year after next year the risk has to be increased further, etc.

If Beatrice and Alice, however, want certainty about the risk of their investment portfolio then they have to be satisfied with what the market is delivering in the long term for this risk. The uncertainty about the average annual yield is very high.

If Beatrice and Alice, again seen differently, compromise and want to limit both uncertainties of return and risk together then they must be prepared to allow a degree of uncertainty in both quantities. This double uncertainty is typically recorded within an agreement in the form of a range in the return to be achieved and a range of acceptable risk. But this double uncertainty easily leads to difficulties of interpretation. Too often, our own expectations repress our consciousness of the dilemma of risk and return and get in conflict with the actual results. Such difficulties of interpretation should be resolved as rarely as possible by changing the advisory agreement. Any modification of the advisory agreement increases the joint uncertainty of risk and return over the term of the entire advisory relationship.

Because certainty about risk and return are mutually exclusive. Risk and return are complementary.

How to decide in the dilemma of uncertainty? Thinking in relationships and clarifying roles

Now, how can advisor and client get out of this quandary and into a stable and profitable business relationship? Dear reader, deciding begins where calculating ends. As you have already read, the dilemma when making decisions under risk is always accompanied by mixed feelings. With the help of psychology, as the science of human thinking, feeling and acting, we want to raise some thoughts which can help Alice and Beatrice find a solution.

A look at the dilemma from a financial-psychological perspective

Investing requires many decisions from the clients. We have learned: Every new decision on the strategic level, which should achieve more certainty for risk or return, includes a new source of uncertainty. This also means: Every change of the investment strategy and every change of the investment advisor has the effect that the reliability of the achievement of objectives is diminished. Conversely, the chances for a good pattern recognition increase with the frequency of interaction. In other words: *The longer advisor and client can work together with the same strategy, with regard to risk and return, the more successful they will be.*

Thus, they should aim to select a robust investment strategy and, similarly, to build a robust relationship between client and advisor.

During an investment advisory relationship both parties see each other infrequently. The low frequency of interaction increases the relevance of the approach to each interaction in the process. This includes the careful selection of the advisor, the optimal use of the time between the annual meetings and the professional structure of the strategy meeting.

In this context we see: The human factor plays an important role in the success. Let us look closely at the roles of both players – client and advisor – using the example of Beatrice and Alice under these perspectives.

The customer – Beatrice

Beatrice has an amount of money that she wants to invest well for her daughter Mary for many years. She wants to make a right decision. For this process, she slips – at first unconsciously – into the role of a financial decision maker. She has to make a lot of different decisions which she has not been familiar with to date.

Particularly new: She will be consciously taking a risk with money. In her previous life, Beatrice has tried to avoid risks – she thinks. What do we know about Beatrice: She married well and has two children. Well, in this case, means that her husband earns a good salary. She, also, has a permanent position she enjoys.

As observer we perceive: Without being aware of it, Beatrice has already taken many risks in her life: She fell in love, she married, and became pregnant: **Beatrice has already taken social, financial and physical risks so far.**

Probably, when making these decisions she has never asked herself: How much risk am I willing to take? How risk-seeking am I? And does the risk I take actually suit me and my attitude towards risk? Another exciting question Beatrice is now confronted with: Do I actually perceive the risk in a situation? Thus, Beatrice has taken the most important (financial) decisions without knowing the risks, and therefore the consequences, of her decisions. And up until now, everything has gone well.

So far she has not consciously perceived the financial consequences and risks of her previous decisions, such as for example the marriage to Marco. Probably she would also find it strange to speak about her marriage as a financial risk with profit opportunities. (This, however, is exactly the material situation in an ordinary marriage which provides an equal distribution of surplus.)

In investing everything is different. Here she sees the consequences – if she wants, even daily – in numbers in her depository account. The role as financial decision maker cannot easily be given up again. Now it's getting serious. For Beatrice it is therefore worth her while to have a better understanding of the role. She wants and has to grow into the role, because Mary entrusted her with an amount of money that should grow well for many years.

She compares this challenge with her role as mother. There, too, she was nearly overwhelmed at the beginning. But over time she gained experience and learned. And now she thinks: The same will happen in her role as financial decision maker.

Yes, the responsibility is big, the consequences of a decision unclear, and mistakes are easily made at every turn. No wonder that very few people like to engage in this role consciously. But you cannot not-decide. Anyone who starts to have more money than she currently needs, is in the role. You have to decide, time and again. Even sticking with an existing investment strategy is a decision. Whether a decision is effective in the long run depends as much on the answer as on the question: Am I aware of the risk I take, or do I decide unconsciously? And am I able to correctly process the information necessary for this?

For example: In investment we see short-term consequences, which are usually irrelevant to the longer-term result. This means that we must learn to distinguish what information is important and what we can ignore. For this, we need our consciousness.

Being conscious pays off

The quality of the process and the success of decisions increase if we make financial decisions consciously. But what should we focus our attention on? From psychology and brain research we know: All decisions people make are composed of three elements: rationality, intuition and emotions. If the components are known to us, and if we are trained to play with reason, intuition and feelings, then our decisions get better with time. But as with any new skill: Beginnings are difficult. And yet, this is not strictly true. There are also initial successes that can make us careless. Therefore, errors at the beginning of the learning curve are really good. They wake us up and show us what is missing.

But what is an erroneous investment decision? If Beatrice sets rules for their decisions, it would be a mistake not to comply with these rules. Why is it a mistake? Investment decisions need rules. The most important rules we learned already: How much risk for how much return? What range of returns for what range of risk is acceptable? Without these two rules the result of our decisions cannot be evaluated. On the one hand, rules provide guidance for buying and selling, on the other hand they restrict us emotionally. One person may feel this restriction more, another less. Investment rules give many a feeling of lack of freedom.

Where is the personal challenge for Beatrice? Let us imagine: Beatrice wants to invest her money in order to allow herself or her daughter (later) to freely decide on how to live their lives. Then rules can lead her to an inner conflict. The unconscious inner conflict can raise unpleasant feelings. But, most probably, Beatrice does not yet recognize this issue.

Beatrice wants to get rid of this uncomfortable feeling. Let us suppose she follows her desire for freedom and breaks the rule, and the value of her portfolios increases. A fatal learning effect: She experiences how a random event coincides with an emotionally motivated decision from another context – freedom instead of rules. The experience gives her a pleasant feeling and she learns: I do not need the rules! She only perceives the short-term consequences. For her it looks as if breaking the rules was *right*.

What she fails to recognize: She missed the opportunity to arrive at a higher frequency of decisions and results as the basis for the evaluation of their rules. This is an essential factor for good decisions.

If Beatrice thinks about it she would have to admit that she, **in order to get rid of her unpleasant feelings, switched off her reasoning.** A typical error in financial decisions.

Beatrice feels, without any doubt: Financial decisions are not child's play. The responsibility for our financial decisions is large. She wants to grow the 100 euros of her daughter

and add each month an additional 100 euros, until the start of university. She reaches an important turning point. She wants to share the responsibility. She cannot talk with her husband about the decision. So, she looks for an advisor. She realizes: Now she must consider very carefully with whom, and to what extent, she would like to share responsibility for her money decisions and outcomes in the future.

Immediately a further risk joins: the social risk, the risk of engaging with another person. We deliberately do not say “to rely on”. “To engage with” very accurately goes to the heart of what happens in a client-advisor relationship. Beatrice’s social risk-tolerance and her assessment of the risk associated with another person are important at the selection of her investment advisor.

Thus, as an investor, Beatrice comes across the subject *risk-tolerance* at two levels: As a financial decision maker who seeks investment advice she needs to know well both her *financial risk-tolerance* and her *social risk-tolerance*. Only then can she believe that both her investments and her investment advisor *suit* her. Nevertheless, a residual risk still remains. A healthy degree of trust is an important component of good decision making.

We summarize: Beatrice has to make decisions. She should make them consciously. In order to do this she doesn’t need knowledge about the markets – her advisor Alice is supposed to assume this task – she only needs the necessary understanding of risk and return. Beatrice will learn: She has to be able to consciously bear uncertainty. And she needs to know what is important to her with respect to her financial advisor and the advisory process. Ideally, she does not only know what she wants, but also what she can expect from an advisor. At least she should bring questions about these issues to their first meeting.

Thus equipped, she bears responsibility from the outset for her actions, laying a sound foundation for the relationship with her financial advisor.

The advisor - Alice

In her office, Alice receives the new client with great pleasure. She knows her from the tennis club and has played against her a couple of times. She knows that Beatrice is looking for an advisor. Following, Alice invited Beatrice to an initial conversation. Alice prepares carefully. When a new client comes she asks a few key questions in order to be able to better assess her needs. Alice is experienced and has learned that an important criterion for success for her advice is to know her customers financial personality well. Alice knows that physical risk-tolerance on the tennis court and the financial risk-tolerance are like two pairs of shoes. Previously she relied on her intuition. And not infrequently she made a mistake in her first assessment. As a consequence, sometimes customers weren’t satisfied with the results. They

could rationalize what risk was about, however, when the risk occurred they could not emotionally cope with it. Customers often saw the solution to this in a change to the investment objectives of their strategy. This in turn generated difficulties in measuring investment success. Consequently came distrust in the advisor, in the markets and distrust in, and uncertainty about, themselves. A huge effort was needed to rebuild trust. Often unsuccessfully.

A financial advisor also has limits

At some point, Alice recognized her limits. As a financial advisor she knows well her way around numbers, data, facts. As a human being she is open and communicative and works easily with new customers. However, she does not have the required financial-psychological knowledge and observation capacity to accurately assess, within a single short conversation, her prospective customer’s financial personality as necessary for a professional recommendation. She needs to know exactly what her customers individually understand as risk. The risk of viewing her customers through the prism of her own risk-tolerance is large for her and of course for her business.

Determining the emotional comfort zone of the customer

The solution was not easy to find. She had high standards because the approach needed to be professionally safe for both the customer and herself. *Objective, reliable* and *safe* were her most important criteria. But, after some searching, Alice found what she wanted. She now uses an objective instrument for assessing the financial risk-tolerance of her customers. She will ask Beatrice to complete the questionnaire. The result is reliable, and, in combination with the discussion about the evaluation, it makes both of them feel more comfortable to find both the right level of risk and feasible return expectations. In addition, Alice can show her client how the risk and the return of the investment strategy which matches her risk profile relate to each other. It allows Alice a mental leap into the future, based on past experience. It’s like a test drive in a prospective new car. Beatrice can be given a feel for the risk that she will take on. Thus Alice can detail the ranges for both risk and return so that in the future Beatrice is kept mostly within her emotional comfort zone. Properly framing investment expectations is the best prerequisite to sticking with an investment strategy.

Responsibility must be properly distributed

With this approach, Alice mitigates the dilemma between risk and return. And the sharing of responsibility between her and her customer is made easier. Beatrice will have an opportunity to engage actively in the decision making process from the outset. This helps her more readily accept her role as financial decision maker. In this way, she gains certainty and confidence in the process. It also has a positive effect on her decision to have chosen Alice as her advisor.

Alice knows that with this approach she will massively reduce customer calls in the markets' next downturn. This even takes the edge off her own anxieties. Previously, she lost much time on her own internal dialog in preparation for the next call. For days, she was busy with thoughts like: What will the customer think if I didn't *deliver* the numbers I promised her? This no longer happens to her.

Coaching as a catalyst

Alice uses a trick from coaching in her advisory process: By means of powerful questions (a questionnaire) she gets her customer to think. This helps, on several levels, to reduce the dilemma between certainty and yield:

- a) The customer gains orientation in her role: What does a financial decision maker do, what does she have to *know*, what does she need to *do* and what not?
- b) A sense of security and certainty on the inside (in the client and in the relationship between the two) is created. This allows a degree of uncertainty in the outside (return-risk-ranges).
- c) The questionnaire and the advisory material include scenarios which Alice uses to discuss results outside of the target range. Hence, she and her client avoid negative feelings in preparation for the next annual assessment meeting. There are no surprises.
- d) Quickly Alice builds a solid trusting relationship with her client, which allows both to contribute effectively to decisions.

Since applying this approach she receives all important information from her clients.

Coaching in the context of financial advice – or cooperation with a coach?

But what does Alice do if Beatrice's risk-taking, amount of money, target and required risk/return-profile do not match?

For Beatrice the question arises: What if I want to deliberately take more risk than my personal setting (financial risk-tolerance) allows?

Alice thinks about what could help Beatrice answer this question. She could tell her about other clients who have made this decision. She could advise her for purely rational, financial reasons to do so. But all of this – Alice knows – would not permanently help Beatrice with her fears and conflicts. Beatrice may be induced to make a decision she may not stick to in the long term. Beatrice does not need information from the outside. She needs stimulating, well thought through questions which enable her to activate her own resources from within. Beatrice wonders: Where does my fear come from and what do I need to do to overcome it?

She also thinks: If I took risk in other situations – even risk of death – why not now take a risk where perhaps a few thousand euros are at stake? What is so different in this case?

Alice decides to recommend Beatrice to call her cooperation partner Francis. Beatrice takes her decision very seriously and she is willing to ask him whether he can make time for her in the next few weeks. He is a financial coach and specialized in these questions. He knows how to help people resolve their conflicts regarding money and risk. This is not Alice's core competency and she knows that advisory clients make decisions much more easily and clearly after financial coaching. The risk of not meeting – with a technically correct recommendation – the emotional needs of the customer is simply too big. She focuses rather on what she does best. Therefore, Alice knows that coaching from Francis is the ideal complement to her specialist skills as a financial advisor.

The financial coach takes over

Francis does not know much about numbers, data, facts, and cannot assign ranges of risks to return targets. But he knows the importance of different facets of the personality and identity of a human in terms of decisions about money and risk better than anyone else. He is happy to work with Beatrice. After having defined the objectives for the coaching he asks Beatrice just a few key questions: "What does certainty mean to you? What is the symbolic role of money in your life? How would your life change if, at once, you would take more financial risk?" Beatrice associates money with independence and freedom. She learned from her mother never to be dependent, neither on money nor on a man with money. To take more risk would now mean to make herself dependent on certain rules and a financial advisor. She realizes: It is actually not an option to avoid dependency. The recommendation of her mother was a dead end. Beatrice, of course, sees that she is actually very dependent. She has an income. However, she doesn't have her own assets, her husband earns the money. Beatrice feels how seriously she must take her own money issues to deal with them successfully.

The coaching with Francis is progressing. In the course of the second interview Beatrice consciously decides to take more risk with her own money. She now wants to take full responsibility for her money and the risk. So she will be able to be a better role model for her daughter. In the third interview, she recognizes the resources that will help her gain more self-confidence in her financial decisions. Beatrice reminds herself that she was an excellent student in school. In mathematics, she was always among the best. Not the specific expertise, but the feeling of being able to understand difficult aspects of financial decisions, motivates her to be particularly attentive in conversation with Alice. She now looks forward to the exchange and the information her advisor shares with her.

Back to advice for Alice

Alice is amazed about what emerged from Francis's coaching of her customer, in such a short time. Alice now has a good impression of Beatrice's characteristic traits. She knows that in order to achieve her own personal goals she must be ready to take a meaningful degree of risk. This makes Alice feel good, too. Her client will now take the necessary risk in order to achieve a good yield over the next years.

The relationship between Alice and Beatrice obtains a new quality through the intervention of Francis. Beatrice feels how much her advisor Alice focuses on her well-being. She likes that Alice knows her limits. This increases her confidence and also gives her the confidence to cope through volatile times. She feels that she has found in Alice a good partner for her *financial life*.

Advise and coaching – an ideal pairing

Coaching and advising are, as roles, in their essence incompatible – and yet perfect complements. The advisor bases herself on the safety of her knowledge, the coach on professional ignorance. The coach enters new territory with her questions, time and again. This combination is ideal for supporting clients when making decisions under uncertainty.

The advisor asks questions that help her to be able to give good recommendations. She is on safe ground based on facts, circumstances and observable behavior.

The coach asks questions that activate the thought process of the client in order to gain knowledge (about herself), which she can use to solve her dilemma (low risk-tolerance/high required risk). The coach operates primarily at the level of mental attitudes, feelings and deeper-lying identity. Together they strengthen the client. She will develop a good self-perception, more willingness to accept responsibility and decision-making capacity in the long term.

Befriending the uncertainty in life

Dear reader, maybe you are already slightly affected by the dilemma that risk and return poses to us, and stimulated to think.

These three findings have directed our writing:

Insight 1 – factual:

There is uncertainty not only in the return I can achieve but also in the risk I want to take for it. There is always a residual risk which I cannot calculate. This uncertainty in the risk, this incalculable risk, can be reduced, but only at the cost of the return uncertainty increasing.

Our encounter with risk undermines our human belief in the predictability of all things which are important to us.

Insight 2 – something personal:

My financial decisions are influenced by my personal associations with money. If I associate money with safety then I decide differently than if I connect it to freedom. If I am not aware of my relationship to money my financial decisions will have unintended consequences. I take risks that I didn't want to, or avoid those which would suit me. A financial coach can help me consciously clarify my relationship to money, harmonize risk and return expectations. Then I can view the residual uncertainties as positive opportunities to consciously design my life.

*With risk we give life – in the uncertainty
we feel human.*

Insight 3 – my personal relationship with my advisor

A stable relationship, which is built on trust, is not only essential for my mental well-being, but also for my investment success. Frequent changes of the advisor agreement increase the joint uncertainty of risk and return.

And at this point, dear reader, when it comes to your relationship with your advisor, a last glance at the findings, which physicists gained from the world of smallest particles, can help us. Uncertainty is fundamental. Complementary variables such as distance and momentum cannot be determined precisely at the same time. The Heisenberg uncertainty principle expresses a lower limit for the joint uncertainty of two complementary quantities. Physicists have given such conditions, which achieve this lower bound of uncertainty, a specific name: These are *coherent states*. Coherent states are rare in nature. They tend to fall apart, to be de-coherent. Just as in the physics of the smallest particles, the same is true also with this third point which, dear reader, is so important to you. Also in the relationship between you (the customer) and your advisor, there is the possibility to reach a coherent state minimizing the joint uncertainty of risk and return.

What does psychology say about it? The coherent state is supported and maintained by developed trust. Little children have no choice, they just need to trust completely. The trust in a grown relationship – such as between client and advisor – is based on a certain ambiguity: On one hand there is an agreement and rules, and at the same time there is the awareness that people can also violate or break agreements. In permanently stable relationships both partners have succeeded to trust and to maintain a healthy distrust in the form of vigilance. This includes to remind oneself, time and again, of the basics of the promise, and also to constructively deal with breaches of trust.

If there is no mutual clarity between the range for return expectation and the boundaries of risk-taking then the supposedly stable contractual relationship between customer and advisor falls apart. The agreements are changed, the

relationship becomes de-coherent and the result is an increased joint uncertainty of risk and return, which diminishes the long-term investment success.

Beatrice has an important reason to build and maintain a coherent relationship with her advisor: She promised her daughter Mary to look after her money well. Only as she got used to the challenge she realized: To invest money *right* for years is almost more difficult than to distribute it *fairly* once.

Beatrice has used the task Mary has given her to learn something new. Without the trust of her daughter she would never have exposed herself to the risk. And she thinks about Mary's future: What will Mary learn during her childhood? Will she know as a grown-up what is fair? How one can share fairly? And with a smile on her face, she asks herself finally: Don't we all have to learn the same thing managing uncertainty? Over and over again?

She looks out of the window watching the children play and she is grateful and touched at the same time.

Risk and return are complementary in every distribution problem – this concerns us all, children and adults.

The exciting thing indeed, dear reader, what we have learned on this little journey of the mind, is our relationship to ourselves and to uncertainty. That we cannot escape this uncertainty. That we cannot replace it by certainty, but only transform it from one form to another. And that we, if we do not act wisely, can only increase this uncertainty. Our desire to avoid uncertainty leads to a larger (complementary) uncertainty elsewhere.

We cannot escape the uncertainty. But we can help to actively shape it. We can, as the philosopher Natalie Knapp puts it, befriend the uncertainty. [1]

¹We would like to thank Dr Natalie Knapp, Prof Dr Thomas Breuer, Helena von Versen, Marcel Everding and Renate Hammerl for their valuable comments, remarks and suggestions for improvements of the text. A special thanks goes to Dr Marie-Christine Mikl and Paul Resnik who were very helpful for the English translation.

[1] N. Knapp, «Kompass neues Denken. Wie wir uns in einer unübersichtlichen Welt orientieren können », Reinbek, Hamburg: Rowohlt Taschenbuch Verlag, 2013.

[2] M. Pirovino, «Uncertainty relations of events: Position and event density are complementary in case of normal distributions», Short Research Note No.1-2013, Opiro Finance Partners Ltd., Triesen (FL), published under: www.opiro.li/science.html