

Expert know-how for Credit Suisse investment clients

# Global Investor Focus

## Sources of happiness

**Chasing happiness** A philosopher's perspective

**Measuring happiness** The economics of feeling good

**Trends** How to invest in happiness



### How happy are you?

Attempts at solving this conundrum have fuelled more than 2000 years of debate among the world's top thinkers. While consensus continues to be elusive, some modern-day experts suggest that personal satisfaction is the key to happiness.

Ed Diener, professor of psychology at the University of Illinois, has been studying happiness, or what he terms "subjective well-being," for more than 30 years. "Subjective well-being is the scientific name for how people evaluate their lives," explains Diener. "It is an umbrella term that includes the various types of evaluation of one's life that one might make – it can include self-esteem, joy, feelings of fulfilment, and more. The key is that the individual is making the evaluation of life – not experts, philosophers, or others. Thus, the individual is the expert, who must ask: 'Is my life going well, according to the standards that I choose to use?'"

So, how does one determine his or her current subjective well-being? One key factor is to determine how satisfied one is with life, from a cognitive, rather than emotionally driven level. The Satisfaction With Life Scale (SWLS), developed by Ed Diener and colleagues in 1985, is a five-item tool designed to measure life satisfaction as a whole. "Life satisfaction refers to a cognitive evaluation or judgment of one's life. For example, 'Is my life overall going well?' People use information to make conscious judgments when they report satisfaction, whereas moods and emotions occur as ongoing reactions to current events," says Diener. "The scale does not assess satisfaction within life domains such as health or finances, but enables subjects to integrate and weigh these domains in whatever way they choose."

Global Investor Focus asked five people of varied ages and backgrounds to complete the SWLS and to answer eight of our own questions about happiness. How satisfied are you with your own life? We invite you to take the SWLS to find out. →



Meyliana Ng  
→→



Jim Rogers  
→→



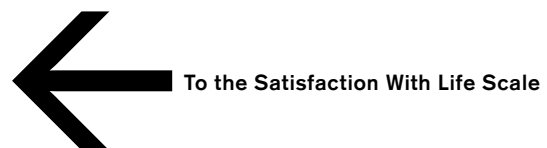
Burkhard P. Varnholt  
→→→



Sister Christine  
→→→



Gonzalo Arregui  
→→→→



# How happy are you?



The Golden Laughing Buddha is the ultimate symbol of happiness and wealth.





Photo page 5/Cover: Thomas Eugster

What does a good life consist of and where can we find our personal sources of contentment and satisfaction?

Numerous specialists have given an answer to these questions in the current issue of Global Investor Focus and the results are really surprising. You will discover, for example, that satisfaction is something that can be measured. In a global comparison involving 80 countries, Denmark came out on top, followed by Switzerland and Austria. There are many paths leading to satisfaction. We have invited people from all walks of life to share their thoughts with us on the subject.

The quality of our social life is certainly important as a source of satisfaction. Harmonious, nurturing relationships with family and friends give us strength. Two other important pillars of a balanced life are having work you are passionate about and fulfilling recreational and leisure activities. It is up to each of us to find the right balance between these two spheres of life. Clearly, the more financial freedom you have, the more liberty you will enjoy to pursue a life of your own design. This independence is yet another source of satisfaction.

A basic element within happiness is personal health, which obviously becomes more important when illness or health problems are an issue. Today's immense store of knowledge and the fast pace of medical advancement are keeping us healthy longer, and thanks in part to groundbreaking technologies, medical science has also made it possible to detect and treat diseases at an earlier stage.

The desire to enjoy life is growing. Sectors that can make a sound contribution to a good life offer correspondingly good growth potential. Our analysts spotlight several of these promising fields in this issue of Global Investor Focus; they include medical technology, pharmaceuticals, food, real estate, tourism and technology. Investing in companies active in these sectors should bring good returns. At the same time, they represent an investment in your sense of well-being and satisfaction. ■

I wish you much pleasure in reading our publication.

Urs Dickenmann, Head Private Banking Switzerland



# Meyliana Ng

Age 34, Nationality Indonesian

Meyliana Ng was born in Sumatra to Chinese immigrants and now works as an accountant in Switzerland. Having a lot of unfulfilled wishes, and at the same time knowing that she has already achieved some of her dreams is part of her happiness today.

**Overall life satisfaction in points 24\***

What was your life's goal as a child, and are you satisfied with the direction your life has taken?

I wanted to become a doctor and live in a foreign country, but soon discovered this profession was not for me because I can't stand the sight of blood. I did make it to a foreign country though. I've spent eight years in Europe and am about to move to America, which is another big dream of mine.

What are you most happy about right now in your life?

That my German husband and his family get along so well with my parents, brothers and sisters despite the differences in mentality.

What was the happiest moment in your life? There have been far too many to pick just one. Professional success is particularly satisfying when I see how proud my husband and my family are of me.

What would you change in your life if you could?

I'd like to have my parents closer to home. Since that's not possible, I'd like to at least celebrate Chinese New Year with them again. However, January and February are the two most hectic months in my field of work so that might not be possible for a while.

What do you consider a luxury? Good food, exactly like it is at home in Indonesia. Sometimes I call up my mom just to ask her about some recipe – but it rarely tastes as good as her cooking.

What influence does money have on your sense of satisfaction? Money isn't everything, but it helps.

What is your idea of an ideal world? Inner and outer harmony.

What influence does everyday life have on how you feel? I feel very good at the end of the day when I manage to balance my professional and personal life.

\*Explanation see cover inside

Interview: Zoe Arnold; photo: Thomas Eugster



# Jim Rogers

Age 64, Nationality American

In the 1970s, Jim Rogers made what he describes as “more money than I knew existed in the world,” managing the Quantum Fund. The commodities guru has since written three books, and is the founder of the Rogers International Commodities Index.

**Overall life satisfaction in points 26\***

What was your life's dream as a child, and are you satisfied with the direction your life has taken?

I wanted to retire by 40 and see the world. To my astonishment and amazement, I was able to retire at 37, and I went around the world twice – once on a motorcycle and once in a car. To top it off, both trips made it into the Guinness Book of World Records.

What makes you happiest at this stage of your life?

I never had a child until I was 60, as I thought children were a waste of time. When my daughter was born on May 30, 2003, I discovered I had been dead wrong. She is a pure joy for me 24/7. I cannot get enough of her. I urge everyone who reads this to get home and get on with it if they have not yet had children.

What was the happiest moment of your life?

There have been many since my little girl came into the world. I have experienced emotions and a depth of feeling that I did not know I could experience.

What would you change in your life if you could?

Where I live. I might change this. We are actively exploring moving from New York to Asia. Most likely to China, as I believe it will be the world's next great nation.

What is luxury for you? Having nothing at all to do, and just being able to sit and read whatever I wish.

What role does money play in your happiness?

It gives me the freedom to do as I please.

What is your vision of a perfect world? No need for passports, visas, or border crossings.

How does everyday life influence your happiness?

Enormously since my little girl came along.

I would rather play with her than doing anything else I can imagine.

\*Explanation see cover inside

Interview: Michèle Bodmer; photo: Thomas Eugster



# Burkhard P. Varnholt

Age 37, Nationality German

As Credit Suisse Head of Financial Products, Burkhard P. Varnholt works and lives in Zurich. The busy father of two boys, ages 1 and 3, is also the founder of the Kids of Africa orphanage in Uganda, where 10 percent of the population are orphaned and 50 percent of the population are under 15 years old. Since its inception in 2003, Kids of Africa ([www.kids-of-africa.com](http://www.kids-of-africa.com)) has grown into a small village with a dozen employees and about 30 children between 4 months and 4 years.

**Overall life satisfaction in points 35\***

What was your life's dream as a child, and are you satisfied with the direction your life has taken?

As a child I always wanted to have an impact in a field, which I enjoy. Today, I enjoy what I do more than I could have hoped. My work is fun for me. I am thrilled every time I can have an impact or assist in a deal, big or small. I am very passionate and happy, and grateful about the direction my life has taken.

What makes you happiest at this stage of your life? There are so many things that come to my mind! I have a wonderful family and enjoy every single moment with them. I love my work, and it makes me very happy. I also find inspiration in traveling, particularly to Uganda, where I have many close friends.

What was the happiest moment of your life?

That's easy: When, on a romantic mid-summer night in Lugano, my girlfriend agreed to marry me!

What would you change in your life if you could?

Nothing. Why take changes?

What is luxury for you? Quality time with my family or friends; traveling and meeting interesting people; a good book; good music and art. Any combination of these.

What role does money play in your happiness?

Obviously, money doesn't buy happiness. But, I know that a lack of money can, and does cause unhappiness.

What is your vision of a perfect world? I don't have one. The world will never be perfect, and I am skeptical of most utopian visions of a perfect world or society. I believe that everybody can try to make this world a better place in many different ways.

How does everyday life influence your happiness?

There are happy days and there are rainy days. Isn't that true for everybody?

\*Explanation see cover inside

Interview: Michèle Bodmer; photo: Thomas Eugster





# Sister Christine

Age 65, Nationality Irish

Sister Christine lives on a council estate under the shadow of the Canary Wharf towers in the London Docklands. She works tirelessly in promoting two grass roots organizations, "Neighbours in Poplar," a charity aiding the elderly and disabled, and "SPLASH," a community charity dedicated to social education, youthwork, and employment schemes. Her efforts are concentrated in the socially challenged and deprived areas surrounding the estate. She hopes to build a healthy community in which everyone has a place, is valued and feels safe.

**Overall life satisfaction in points 31\***

What was your life's dream as a child, and are you satisfied with the direction your life has taken?

I was going to be a singer, an air hostess, and an architect. You could say I've done a bit of architecture on the community in which I live. It hasn't gone the way I expected – it has gone better.

What makes you happiest at this stage of your life?

The simple things are enough to make me happy – like someone saying thank you and feeling that I've made a difference.

What was the happiest moment of your life? There have been many, and most have taken place outside of the church, like watching the crashing of the waves from the Atlantic Ocean on the beautiful west coast of Ireland.

What would you change in your life if you could?

I would like to have been more assertive, and to have learned to play chess to be a better strategic thinker. This might have helped me to deal better with the authorities in order to get things the young people in this estate need. There are things outside of me I would change, such as the cavalier way in which many people who have authority treat others.

What is luxury for you? I have made a vow of poverty and deliberately live simply.

What role does money play in your happiness?

Much of my happiness has to do with my role in the community. Money has a role in allowing good things to happen without having to scrimp to make a positive difference.

What is your vision of a perfect world? People living in harmony and giving each other the benefit of the doubt. In my area, it means encouraging other community members to work towards common goals.

How does everyday life influence your happiness?

My saving grace is my humor. I think that there is an element of comedy in so many human situations and, of course, there is always the inimical East End sense of fun and humor!

\*Explanation see cover inside

Interview: Giles Keating and Michèle Bodmer; photo: Thomas Eugster

# Gonzalo Arregui

Age 21, Nationality Argentinean

Gonzalo Arregui is confident that he will someday leave his architectural fingerprint on the sprawling metropolis of Buenos Aires. He is studying architecture in Buenos Aires and works part-time at a local architecture office. Gonzalo lives quite a distance from the capital in a quiet and peaceful suburb, and he is happy to still be living with his parents and siblings.

**Overall life satisfaction in points 27\***

What was your life's dream as a child, and are you satisfied with the direction your life has taken?

I always wanted to lead a quiet life and that childhood dream has, to a large extent, been fulfilled. When I was younger, I had a different dream job in mind – I wanted to become a doctor. But, now I'm glad that dream didn't come true.

What makes you happiest at this stage of your life?

Being surrounded by a happy environment, which means my family. We get along very well. And having good friends.

What was the happiest moment of your life? My own happiness often depends on the happiness of others, for example, when I see how my physically disabled brother overcomes the challenges that each day brings.

What would you change in your life if you could?

Maybe I would undo certain situations in the past, for example the fatal sports accident of my best friend. On the other hand those are tests that must be overcome.

What is luxury for you? Considering the difficult situation Argentina is in right now, just having a home and a job and being able to study, and being healthy, is a luxury in itself. And, having a car.

What role does money play in your happiness? Money is important, but I definitely wouldn't sacrifice my leisure time or jeopardize my friendships for more luxury.

What is your vision of a perfect world? One in which all people can live a life in dignity. Today in Argentina that, unfortunately, is not possible.

How does everyday life influence your happiness?

I'm glad that I can study and that I have a job. And that's important because I spend a lot of time doing those two things.

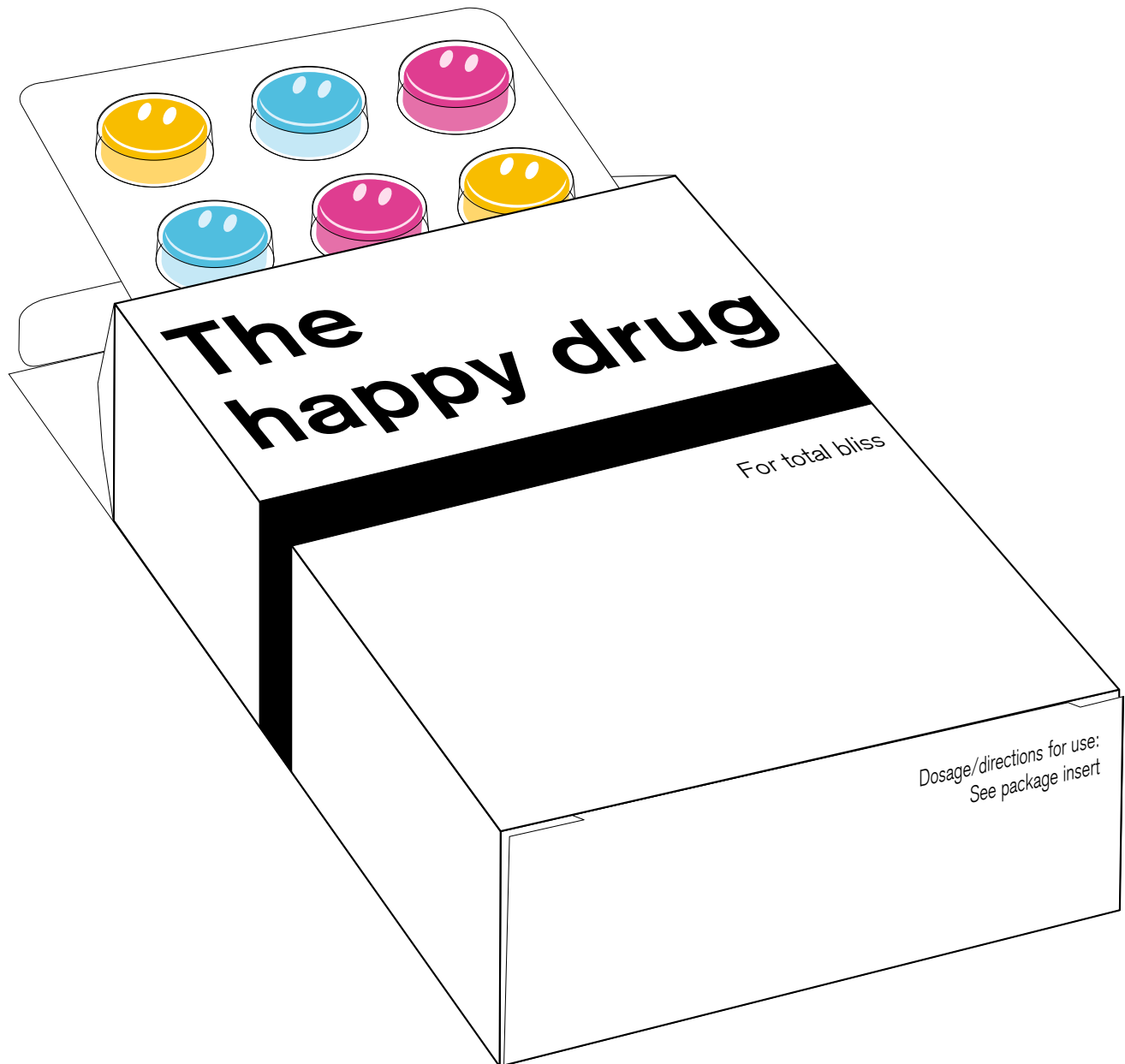
\*Explanation see cover inside

Interview: Andreas Thomann; photo: Thomas Eugster



# Contents

		<b>Is feeling good always what motivates us?</b>
<b>Sources of happiness</b>	12	Happiness is elusive. Philosopher Stephen Law attempts to get to the core of the question “What is happiness?”
		<b>Happiness can be measured</b>
	18	Economist Bruno S. Frey is convinced that measuring happiness has led to new visions in economics. He shares his insights.
		<b>Unearthing the roots of happiness</b>
Roundtable	23	Two leading economists, an endocrinologist, a humanitarian, and a top CEO discuss the many possible factors of happiness.
		<b>Medical breakthroughs optimize health and happiness</b>
	34	Today’s medical breakthroughs can significantly contribute to happiness by helping people stay healthy or overcome illness.
		<b>Trends and investments</b>
Investments	38	Beyond the consumerist model of happiness. A look at trends and investment opportunities.
		<b>Services</b>
	54	Authors
	56	Disclaimer
		Imprint
		Glossary/Links



**Utilitarianism**, in its simplest form, says that the right thing to do in any given situation is to act to produce the happiest outcome – the happiest outcome being that which involves the most pleasure and the least pain. One glaring problem with the simpler forms of utilitarianism is that they seem prone to an obvious sort of counter-example. What if we could make everyone feel wonderfully happy by constantly injecting them with a happy drug? Would that be the right thing to do, morally speaking? (See page 14, “The happy drug”)

# Is feeling good always what motivates us?

Happiness is elusive — something we work hard to achieve, yet rarely seem to find. As T.S. Elliot reminds us, the harder we strive to attain happiness, the more quickly it seems to recede over the horizon.

**Stephen Law**, Lecturer in Philosophy at Heythrop College, University of London

“We see them everywhere, those trying desperately for happiness: pitifully chasing clouds of butterflies, laughing too loud, drinking too much, buying too much, working too hard; hating themselves.”  
T.S. Elliot

Perhaps one reason happiness is hard to achieve is that it's not entirely clear what we're after. So let's begin by asking: what is happiness? Nowadays we tend to think of happiness as a transitory feeling. Take the social scientist Richard Layard – he defines happiness as “feeling good.”<sup>1</sup> But this is not the only possible conception of happiness. In fact, happiness as Layard defines it is a comparatively modern notion. The ancients viewed happiness very differently. According to Aristotle [384–322 BC], for example, happiness, or eudaimonia, is not a feeling. Rather, it's a feature of a complete life. It's also a moral feature. A happy individual is one who has lived a life of virtue and good character.

“The Good of man is the active exercise of his soul's faculties in conformity with excellence or virtue. (...) Moreover this activity must occupy a complete lifetime; for one swallow does not make spring, nor does one fine day; and similarly one day or a brief period of happiness does not make a man supremely blessed and happy.”  
Aristotle

To modern ears, this can sound odd, as we no longer associate happiness with morality in the way the ancients did. Aristotle believed that a virtuous individual would thereby be a happy individual. The link between virtue and happiness was partially severed by the Christian church, particularly during its more ascetic periods. A virtuous life may eventually bring the reward of happiness, it was thought. But, in the next life. Some Christians have supposed that the more one suffers now, the better. Not only have they shunned worldly pleasures and preached abstinence, they have even, like St. Jerome, embraced self-flagellation or, like Origen, self-mutilation. Today, we tend to be much more relaxed about seeking happiness in this life. The link with morality found in Aristotle's *Nicomachean Ethics* has almost entirely been lost, and the suggestion that the best way to achieve happiness is to live a virtuous life is rarely, if ever, made.

## Is feeling good always what motivates us?

Let's now turn to a rather different question: is happiness our ultimate aim in life? Many assume it is. The only reason we do anything, they say, is to make ourselves feel better, to maximize our own happiness. Richard Layard, for example, claims that “From the



Photo: Thomas Eugster

**Stephen Law** is lecturer in Philosophy at Heythrop College, University of London, and editor of the Royal Institute of Philosophy's new journal "THINK: Philosophy for Everyone." → see full biography, page 54

various possibilities open to us, we choose whichever combination of activities will make us feel best." <sup>2</sup> This is the view of the psychological hedonist. This explanation of why we do what we do is open to a well-known objection. Achieving a feeling of happiness and contentment is not always what motivates us. Suppose, for example, that, after seeing the suffering of starving children on TV, you decide to give generously to charity. Surely you're acting to increase the happiness of others, not yourself? "Not so" comes the reply. "The real reason you give to charity was to make yourself feel better — to salve your own conscience and make yourself feel noble. So, your motive for acting was to make yourself feel good."

As an explanation for why anyone ever acts charitably, this won't do. In the film "Total Recall", scientists of the future figure out how to implant false memories. For example, people choose to have "memories" of a fabulous holiday implanted, and so get to have all the good feelings that go with them, without having to pay for the expensive vacation. Suppose a similar, risk-free memory implant is offered to you. You can give generously to charity, or else you can have a memory implant of having given generously to charity and keep the cash. With the second option you get to enjoy feeling good about having been generous, and also get to feel good about spending the cash. Would you accept the offer? Of course not. No doubt you would still want to really give to charity. Yet, if making yourself feel good were all you were after, the memory implant would be the obvious choice. True, acting to help others does often make us feel happier. It doesn't follow that making ourselves feel happier is our reason for doing it. In many cases, it clearly isn't.

### **Is maximizing happiness always morally the right thing to do?**

Now to another question concerning happiness: Is maximizing happiness always morally the right thing to do? Jeremy Bentham (1748 – 1832), the father of utilitarianism, famously declared: "The greatest happiness of the greatest number is the foundation of morals and legislation." Utilitarianism, in its simplest form, says that the right thing to do in any given situation is to act to produce the happiest outcome – the happiest outcome being that which involves the most pleasure and the least pain. Bentham himself developed a "felicific calculus" into which factors such as intensity and duration of pains and pleasures could be fed to calculate the right course of action. Here's a simple example of such a utilitarian calculation – should I steal that child's sweets? Doing so might give me the pleasure of eating them, but it would deprive the child of the same pleasure and cause her considerable unhappiness to boot. So, the right thing to do on this simple utilitarian calculation is not to steal the sweets.

### **The happy drug**

One glaring problem with the simpler forms of utilitarianism is that they seem prone to an obvious sort of counter-example. What if we could make everyone feel wonderfully happy by constantly injecting them with a happy drug? Would that be the right thing to do, morally speaking? No. Turning everyone into blissed-out dopeheads would be wrong. Making people "feel good" may be of some moral importance, but it's not of overriding importance.

### **Higher and lower pleasures**

One way in which a utilitarian might respond to this sort of counter-example is to distinguish between higher and lower pleasures.

J.S. Mill (1806–1873) does precisely this. An intense, drug-induced reverie may be agreeable, but it produces a pleasure of a very shallow sort compared with, say, the pleasures of the intellect – which, according to Mill, include the appreciation of poetry and philosophical debate. Doping people up to the eyeballs may induce a kind of pleasure, but it deprives them of the opportunity to enjoy higher, more important pleasures. Which is why it would be the wrong thing to do. This distinction between higher and lower pleasures may get the utilitarian off the hook so far as the happy-drug objection goes, but it strikes many as objectionably elitist and paternalistic. Is the pleasure of engaging in philosophical debate or listening to Mozart really superior to that of filling ones belly with chocolate ice cream? Aren't such distinctions mere snobbery?

Mill thought not. He argues that only those who have experienced both the higher and lower pleasures are in any position to judge which are best, and those who have had the luxury of experiencing both tend to prefer the higher. But is this true? Actually, many of those in a position to enjoy both kinds of pleasure like to be seen to enjoy the higher while secretly overindulging their taste for the lower.

#### **Transplant case**

Another classic counter-example to utilitarianism is the transplant case. Suppose you're the doctor in charge of six patients. The first has a minor medical condition easily cured. The others have failing organs and will soon die without transplants. No replacement organs are available, but then you discover your first patient can provide perfect donor organs for the rest. So, you can murder the first patient to save the rest. Or you can cure the first and watch five die. What is the right thing to do?

A simple utilitarian calculation suggests you should kill the first patient to save the rest. After all, that will result in five happy patients and only one set of grieving relatives rather than one happy patient and five sets of grieving relatives. Yet the killing of one patient to save the rest strikes most of us very wrong indeed. What this case brings out, it's suggested, is that the right course of action is not always to maximize happiness. Indeed, it's said that such cases demonstrate that human beings have certain fundamental rights, including a right to life, and that these rights ought not to be trampled, whatever the consequences for happiness.

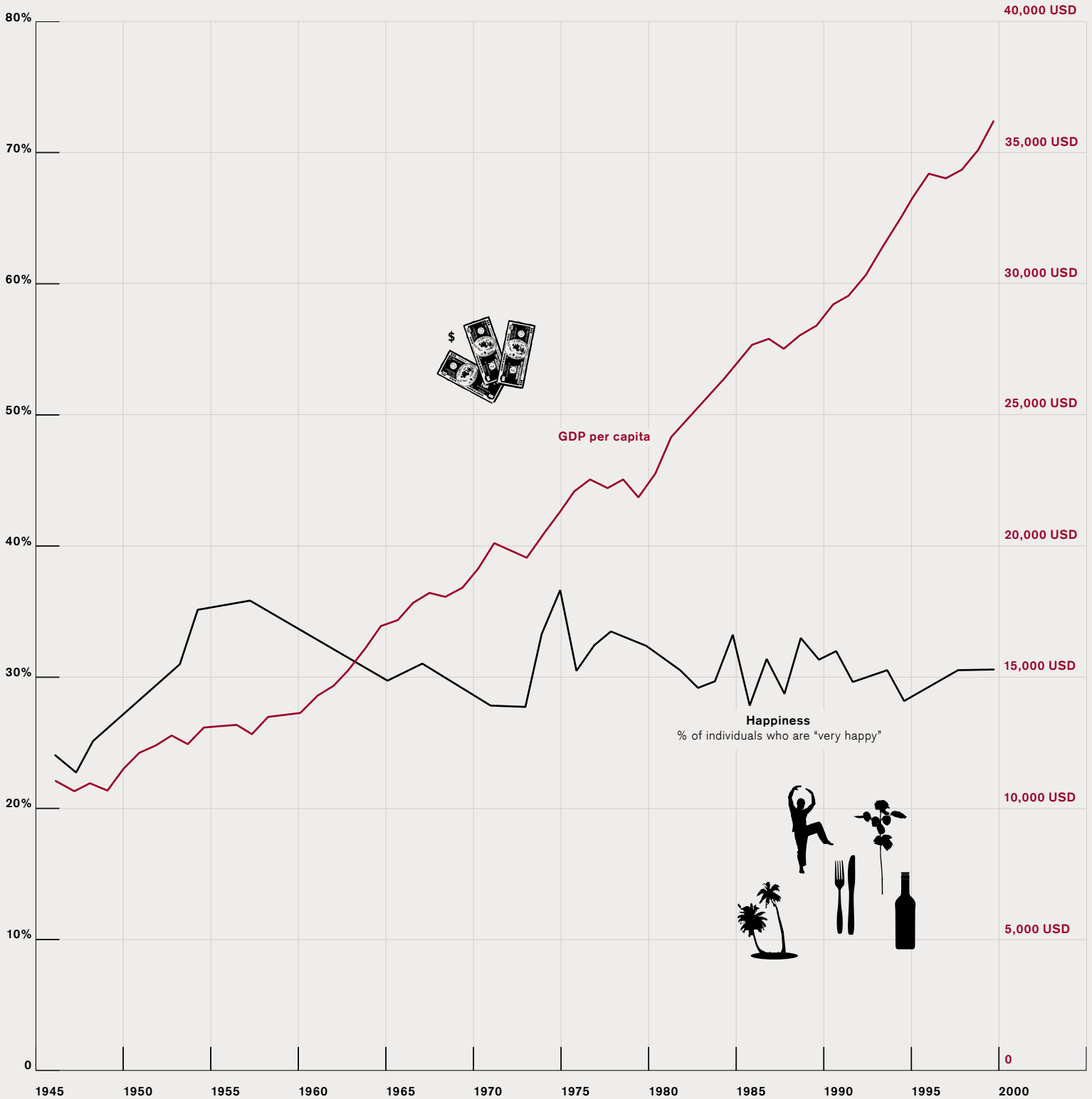
#### **Nozick's experience machine**

Here's one last apparent counter-example to utilitarianism from the contemporary philosopher Robert Nozick. Suppose a machine is built that can replicate any experience. Plug yourself in and it will stimulate your brain in just the way it would be stimulated if you were, say, climbing Mount Everest or walking on the moon. The experiences this machine generates are indistinguishable from those you would have if you were experiencing the real thing.

For those who want to experience exotic and intense pleasures, this machine offers a fantastic opportunity. It can even induce higher pleasures – the pleasure gained from engaging in a philosophical debate or listening to a Beethoven symphony need be no less intense for being experienced within a virtual world. Many would be keen to try out this machine, but what of the offer permanently to immerse yourself in such a pleasure-inducing world? Most of us would refuse. Someone who has climbed Everest in virtual reality has not really climbed Everest. And, someone who has enjoyed a month-long affair with the computer-generated Lara

**Is happiness just about feeling good, or is there more to it than that?**

**Is increasing happiness always morally the right thing to do?**



Source: Credit Suisse, Note: Data from the book titled "Happiness: Lessons from a new science" by Richard Layard

**Money can't buy happiness:** Americans haven't become happier even though income has risen significantly in the United States. In fact, satisfaction and happiness have not changed much since the 1950s. Is gross domestic product an accurate measure of how well we are doing as a society? Not according to psychologist Paul Wachtel, who argues: "Consumption is a treadmill, with everyone judging their status by who is ahead and who is behind."



Croft has not really made any sort of meaningful connection with another human being.

The truth is we don't just want to "feel happy." Most of us also want to lead lives that are authentic. Someone who (like Truman in *The Truman Show*) has unwittingly lived out their whole life within a meticulously controlled environment might subjectively feel content and fulfilled, but were they to be told on their deathbed that it had all been a carefully staged illusion – that there had been no real relationships; that their "achievements" had all been carefully managed – then they might well feel that theirs was, after all, a life sadly wasted. Again, it seems that feeling good is not, ultimately, what's most important to most of us. Nor, it seems, is arranging things to maximize the feeling of happiness always morally the right thing to do. Secretly plugging everyone into a deceptive, Matrix-like pleasure-inducing virtual world would surely be very wrong indeed.

### **The consumerist model of happiness**

To finish, let's take a brief look at the link between happiness and consumerism. We have seen how our modern conception of happiness has taken a subjective turn. By focusing increasingly on feeling good, it has also become increasingly consumerist. Often as not, the way in which we seek to feel good is by acquiring more stuff. Westerners have become significantly wealthier over the last 50 years. We own more color TVs, microwaves, cars, etc. than ever before. And yet, they do not appear to be appreciably happier. The proportion of Americans describing themselves as "very happy" has remained about one-third since the 1950s, despite their increasing affluence. Why is this? The psychologist Paul Wachtel believes the explanation lies in a feature of human psychology known as adaptation. We have simply become accustomed to rising levels of affluence. In fact, when affluence continues to increase, but not quite so sharply, people end up less happy and perceive themselves to be poorer than they were before.

"In judging how well off we are economically ... we assimilate new input to our 'adaptation level.' For many Americans, having one or several color TV sets, two or more cars ... these and others features of their lives are experienced as the 'neutral point.' They do not excite us or arouse much feeling. Only a departure from that level is really noticed."<sup>3</sup>

The endless spiral of material acquisition cannot make us more content. Like a drug addict, we simply become accustomed to whatever we're getting, cease to derive much pleasure from it, and start demanding even more. As a result, explains the philosopher Peter Singer:

"Once we have satisfied our basic needs, there is no level of material comfort at which we are likely to find significantly greater long-term fulfilment than at any other level."<sup>4</sup>

And, of course, if the resources on which we're drawing are finite, ever-rising levels of consumption are impossible to maintain. Singer argues that we need fundamentally to rethink our attitudes to contentment and reject this consumerist model of happiness that is dragging us all to our doom. He may be right.

### **Conclusions**

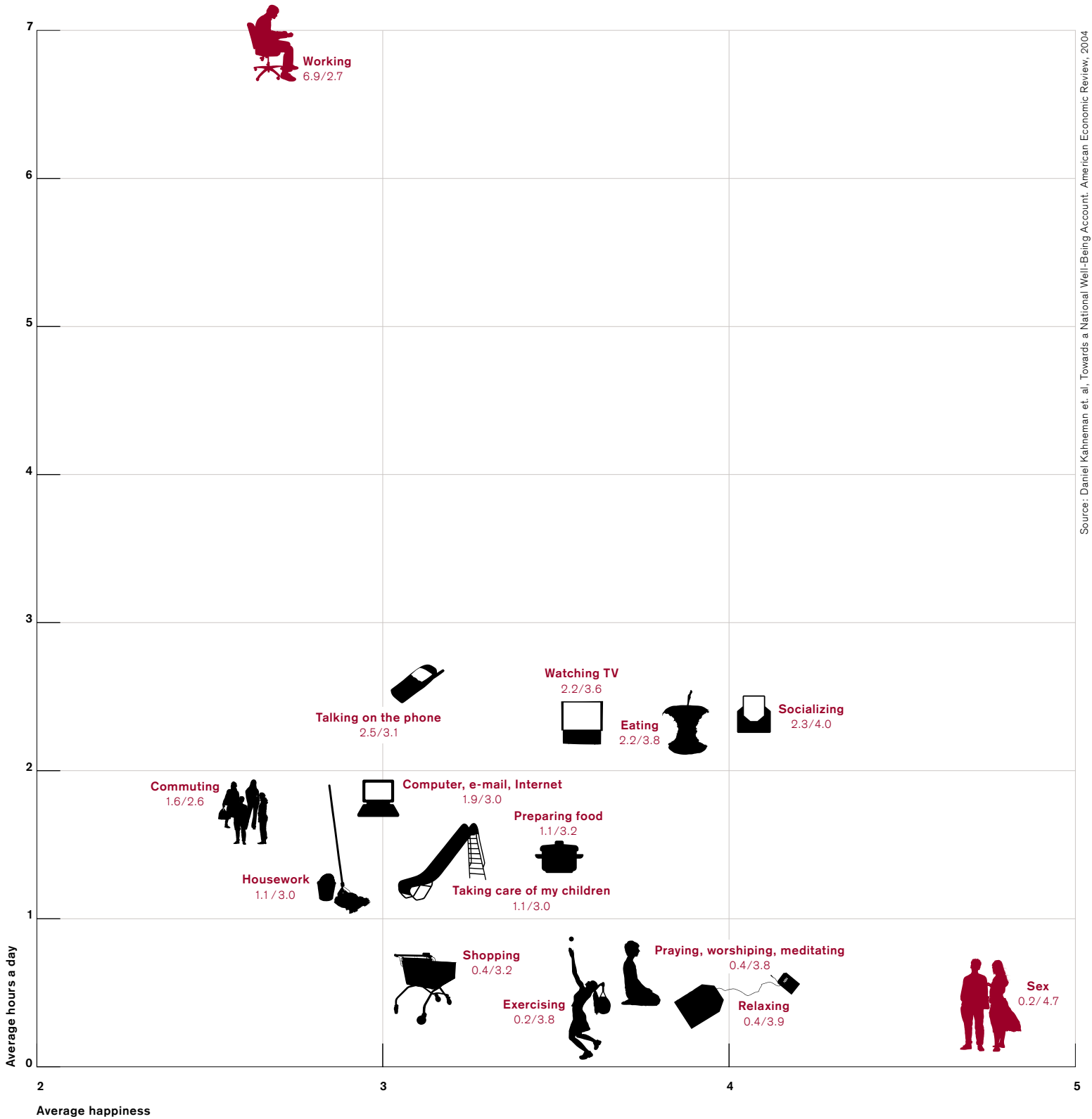
→ Our modern conception of happiness as "feeling good" is not the only possible conception of happiness. Nor is it the best conception. In losing sight of the ancient notion of happiness, might we have lost sight of something valuable? → Those who believe we always act to make ourselves "feel good" are mistaken. Feeling good is not what's most important to us. → Nor, it seems, is maximizing happiness always morally the right thing to do. ■

<sup>1</sup> Lionel Robbins Lectures 2002/3.

<sup>2</sup> Ibid.

<sup>3</sup> Quoted in Peter Singer, *How Are We To Live?* (Oxford: Oxford University Press) p. 60.

<sup>4</sup> Ibid, p. 61.



Source: Daniel Kahneman et. al. Towards a National Well-Being Account. American Economic Review. 2004

**Happiness in different activities:** The chart above shows that Texan women spend most time at work, but are not particularly happy about it. Commuting and housework takes less time, but is not considered pleasurable. Texan women are happiest having sex (but they spend little time doing so), as well as socializing and relaxing. Eating and cooking also makes them quite happy.

# Happiness can be measured

Most people believe happiness cannot be measured, however, recent advances in research enable individuals to capture how happy they feel themselves to be. The different notions of happiness can be measured by representative surveys of individual life satisfaction, experience sampling, the Unhappiness Index, and brain scanning. They correlate highly with aspects generally associated with happiness. The insights help us to improve policy-making by allowing individuals to best achieve their own path to happiness.

**Bruno S. Frey**, University of Zurich, and CREMA (Center for Research in Economics, Management and the Arts)

Can human happiness be measured? Most people find this to be inconceivable, believing that happiness is a very private, fundamental feeling that is impossible to communicate to others, and therefore escapes any serious measurement possibilities. This opinion has been shared by professional economists who have traditionally been most sceptical about direct measures of individual well-being or utility. In their view, these private events are taken to be experienced in many different ways and are not to be compared between individuals.

There is certainly some truth in this opinion. It is, of course, difficult and tricky to empirically approach the concept of happiness. Nevertheless, I would like to convince the reader that recent research in economics and psychology has indeed been able to satisfactorily capture how happy people are. There is now a widespread consensus that utility and well-being can be accurately measured. A leading proponent of this idea is Daniel Kahneman, a psychologist who received the 2002 Nobel Prize in Economics for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty. This advance has been achieved by avoiding to define what happiness is (this is left to the philosophers who have dealt with this problem for centuries) but rather to ask individuals how happy they feel. There is no single, overriding con-

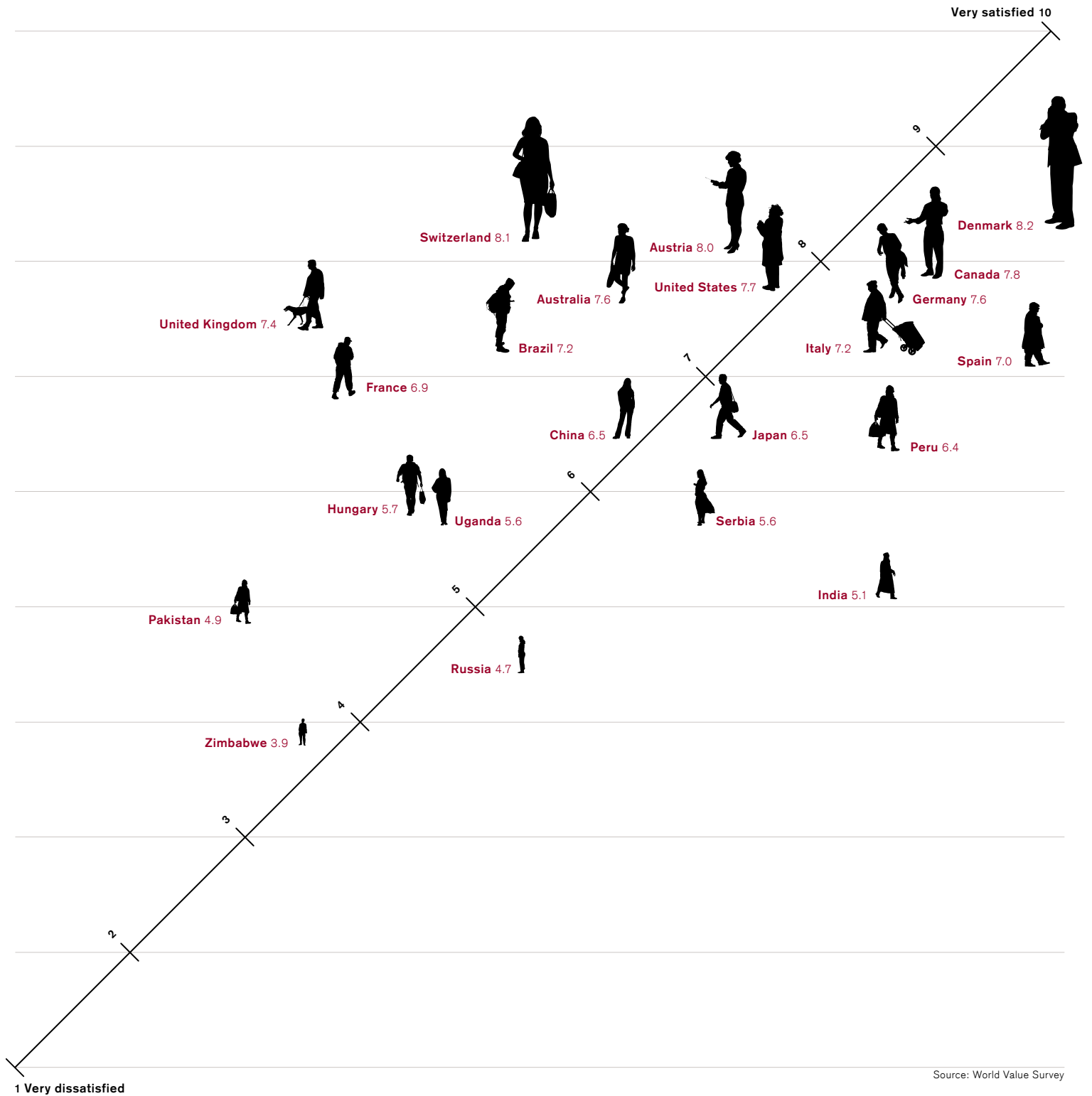
cept that registers all experiences and feelings; the following conceptions of happiness can be distinguished:

- Subjective well-being refers to different types of positive and negative evaluations made by people regarding their lives.
- Positive and negative affect denotes pleasant and unpleasant moods and emotions, respectively, such as joy and sadness.
- Life satisfaction refers to how an individual evaluates his or her life taken as a whole and is a broad, reflective appraisal the person makes of his or her life.
- Quality of life designates the degree to which a person's life is desirable rather than undesirable, and is often connected to external components such as the natural environment. It is often expressed as "objective" in contrast to subjective well-being.

There are four prominent approaches to measure the happiness of individuals:

## Global Evaluations of Individual Life Satisfaction

This approach seeks to capture happiness by asking a representative sample of individuals about their overall satisfaction with the life they lead. Life satisfaction is, for example, assessed on a scale from one (very dissatisfied) to ten (very satisfied) in the World Values Survey. People answer the question: "All things considered, how satisfied are you with your life as a whole these days?" The



Source: World Value Survey

**Life satisfaction around the world at the turn of the century:** The chart above shows average life satisfaction on a 10-point scale for selected countries at the turn of the century. The data was collected by the World Values Survey, and is the result of a worldwide investigation of sociocultural and political change. The survey has produced evidence of gradual but pervasive changes in what people want out of life.

Eurobarometer Surveys, covering all members of the European Union, asks a similar question: "On the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?" There are also multiple-item approaches, the most prominent being the Satisfaction With Life Scale, composed of five questions, rated on a scale from one to seven.<sup>1</sup>

Almost all of the empirical work so far undertaken in economic happiness research has been based on such representative, large-scale sampling of individuals' global evaluations of their life satisfaction. The great advantage of this measurement approach is its good performance compared to its cost, as well as its availability for a large number of countries and periods. Thus, for example, the surveys on life satisfaction contained in the World Values Survey today cover 80 countries representing over 80 percent of the world's population over four periods (see chart on page 20).

As subjective survey data are based on the judgment of individuals, they are less prone to potential distortions of biases. It therefore needs to be verified whether people are indeed capable and willing to give meaningful answers to questions about their well-being. Moreover, reported subjective well-being may depend on the order of questions, the wording of the questions, scales applied, actual mood and the selection of information processed. The relevance of these errors, however, depends on the intended use of the data. Often, the main use of happiness measures is not to compare levels in an absolute sense, but rather to seek to identify the determinants of happiness.

One indicator that such measurements credibly capture important aspects of well-being is shown by the fact that they correlate highly with behavior and aspects generally associated with happiness. Consistency tests reveal that happy people are more often smiling during social interactions; are rated as happy by friends and family members, as well as by spouses; express more frequent expressions of positive emotions; are more optimistic; are more sociable and extraverted; and enjoy better sleep. Happy individuals are also less likely to commit suicide.

### **Experience Sampling**

This approach collects information on individuals' experiences in real time in their natural environments. A representative selection of individuals is supplied with a beeper or a hand-held computer asking them at random instances of time to immediately answer a battery of questions with regard to momentary positive and negative affects in that particular moment. Respondents are also asked to state the intensity of their feelings. Happiness can then be calculated by the aggregation of these instantaneous statements of affect.

The Day Reconstruction Method of measuring happiness is a special variant of experience sampling. It collects data describing the experience a person has on a particular day through a systematic reconstruction undertaken the following day. Respondents are asked to reconstruct the previous day by filling out a structured questionnaire. The respondents first recall the activities undertaken the previous day into working memory by producing a sequence of episodes. They then describe each episode in detail by identifying when, what, where, and with whom the episode took place. The respondents then rate these episodes in terms of positive affect (happy, warm/friendly, enjoying myself) or negative affect (frustrated/annoyed, depressed/blue, hassled/pushed around,



Photo: Thomas Eugster

**Bruno S. Frey**, the Swiss welfare economist, is co-founder of the Center for Research in Economics, Management and the Arts (CREMA) in Switzerland and acts as its research director. → see full biography, page 54

angry/hostile, worried/anxious, criticized/put down). Moreover, the feeling of being competent, impatient for the episode to end or tired is also asked.

Capturing daily life experience by the Day Reconstruction Method enables more refined measures of happiness than is the case with representative surveys confined to one question. By carefully splitting up the past day into episodes the respondents are induced to think carefully how they felt during each time period. They are less prone to potentially severe distortions of memory known to be especially severe in the recall of affect. The Day Reconstruction Method is new and it has been empirically used only on an experimental basis. It must be left to the future to what extent, and for which specific issues, happiness researchers will rely on this measurement approach.

### **The U-Index**

In the Life Satisfaction and Experience Sampling measures there is no guarantee that the scales used adequately map the corresponding feelings into numbers. The question is whether the answer of “very satisfied” is really worth twice the value of the answer “not satisfied.” The U-Index (or “Unhappiness Index”) intends to avoid this concern. The U-Index is defined as the fraction of day that an individual spends in an unpleasant state. An episode is unpleasant if the most intense feeling the individual experiences in that episode is a negative one. The U-Index relies on the observation that the dominant emotional state of most of the people during most of the time is positive. Hence any episode when a negative feeling occurs is a significant occurrence. It is thus assumed that a dominant negative emotion colors an entire episode. Obviously, this is a rather special assumption focusing on a particular—unpleasant—state of mind while positive experiences are disregarded.

### **Brain Imaging**

Brain Imaging is a quite different measuring approach to approximate utility in a quantitative way. It consists in scanning an individual's brain activities. The newest method is functional magnetic resonance imaging which tracks blood flow in the brain using changes in magnetic properties due to blood oxygenation. Happy persons reveal a characteristic pattern of electrocortical activity. They exhibit greater activity in the left than in the right prefrontal

cortex. This prefrontal cortical asymmetry between more or less happy people correlates with self-reported measures of well-being, behavioral activation (rather than inhibition), and even with antibody response to influenza vaccine.

The measurement of happiness has yielded useful insights to better understand the economy and society. On the macro-level, it is increasingly accepted as a complement to the long-established national income measure, thus following the lead of social indicators. The United Kingdom and Australia as well as some other countries are committed to producing national measures of well-being, and the Kingdom of Bhutan proclaimed that it wants to maximize “Gross National Happiness” rather than Gross National Income. One important finding from happiness research has been that democratic institutions, in particular those allowing citizens to directly participate via popular initiatives and referenda, increase citizens' happiness. The same positive effect has been shown to apply when citizens can participate in political decision-making at the local level.

At the micro-level, the measurement of happiness allows us a more direct welfare analysis than in standard welfare economics, and therefore may be a useful complement. The exclusive reliance on revealed preference in micro-economic theory is valid only if individuals act in a fully rational way. In reality people often make inconsistent choices: they fail to learn from experience or do so incorrectly, refuse to engage in beneficial trades, compare themselves to others, have insufficient self-control, mispredict future utilities of consumption, and depart in many other ways from the model of the rational economic agent. To the extent that this happens, individual choices do not reflect true preferences and expanding their opportunities will not necessarily increase utility. This may lead to fundamental changes in evaluations, an example being that American workers would be happier with more vacation and less pay.

The possibility to adequately measure happiness has led to new visions in economics. The insights gained from happiness research are most useful. They help us to improve policy-making by choosing those institutions in society allowing individuals to best pursue their own ways to achieve happiness. Important examples are direct democracy and federalism which raise the possibilities of citizens to actively participate in political decision-making and therewith raise their happiness. ■

<sup>1</sup> Test available on inside cover



# Unearthing the roots of happiness

Are humans geared to determine happiness based on comparisons with our fellow beings? Can money make you happy? What role do genetics play in your chances of being truly happy? We posed these questions – and more – to two leading economists, an endocrinologist, a humanitarian, and the head of one of the world's biggest chocolate manufacturers, with surprising results.



**“Happiness is a delicate, intricate fabric that can be worn ragged by too much talk.”**

Jakob Kellenberger, President of the International Committee of the Red Cross



→ Giles Keating: How do you define happiness?

Richard Layard: As feeling good and wanting to go on feeling that way. I define unhappiness as feeling bad and wanting to stop feeling that way. I believe, therefore, that happiness and unhappiness are just different points on the same spectrum of experience. I think of it as a dimension of every moment or aspect of our lives that goes up or down like the temperature, for example.

Jakob Kellenberger: It is simply seeing the people around me happy, especially my wife and children. And, it's also having the feeling of being up to a challenging task.

Amlan Roy: Happiness is a state of mind and spirit relative to expectations. It is related closely to good health, stable employment, a good marriage or relationship, and living in a safe neighborhood and society.

Patrick De Maeseneire: It is very personal. It's a combination of feelings – a series of lined-up snapshots. It is personal well-being, being healthy, and knowing that my family is healthy. It's also about achieving results, seeing my team members achieving them, having fun, smiling, and laughing.

Gerhard Baumann: Happiness is the ability to lead a productive life, have satisfying work and good friends. It's about being able to help family and friends, and having enough time and money to pursue personal interests. And finally, it is about being able to live healthily and without physical or mental pain.

Giles Keating: Why do people define happiness so differently?

Jakob Kellenberger: Simply because they experience feelings of pleasure differently.

Gerhard Baumann: People have different priorities. Despite that, I am not sure that there are major differences in the definition of happiness.

Amlan Roy: I believe there are two reasons. People frame their expectations differently. For example, they consider different criteria contributing to happiness, or weight identical criteria differently. People also measure deviations from their expectations very differently, and asymmetrically when expectations are over- or underachieved. People change their definitions of what constitutes happiness during the course of their lives too.

Patrick De Maeseneire: It's very personal. For some it's more emotional, for others it's material, or sometimes a combination.

Richard Layard: Some people define happiness in terms of

the things that will produce happiness, rather than as happiness itself. Aristotle believed that you would achieve a good mental state if you lived a life of virtue, public service and contemplation. So, he defined happiness as if it included its sources, as well as happiness itself. A lot of debate has been confused by causes and consequences. Some of this confusion was continued by John Stewart Mill when he distinguished between the quantity and quality of happiness. The things which he considered high-quality happiness were things that actually generate long-term happiness rather than short-term highs. For pure thinking, it is unfortunate to confuse the causes with the consequences.

Giles Keating: Health, financial situation, social and family life, work, work-life balance, and freedom are often cited as "sources of happiness." How do they contribute to happiness, in your view?

Richard Layard: Relationships are a very important factor explaining happiness. Work, whether you have it, and the quality of your working relationships also ranks very high. The relationships with your friends and the relationships with people in your community rank a bit lower. Health is also very important. Mental health is ranked as more important than physical health, because most people enjoy relatively good health for much of their lives. However, continuous physical pain is one the biggest sources of unhappiness. Another factor that always arises is a person's values, and whether they believe in God. It is apparent that the happier people and societies are those with stronger beliefs.

Gerhard Baumann: Health and freedom are paramount. Finances have to be sufficient to guarantee food and shelter. Work is, of course, very important, particularly if it is interesting and productive.

Amlan Roy: Good health and possessing knowledge and skills allow one to perform well at work, enjoy sports and recreation fully, have the energy to contribute to charitable activities, and to help others. Good financial status allows one the time to pursue activities other than work that give oneself, as well as others, pleasure. Good work-life balance allows one to be less stressed, be mentally and psychologically upbeat, and be a positive person in family, work and society. Having a good social and family life increases one's self-esteem and helps a sense of belonging to a group that one can fall back on in times of need.

Giles Keating: Which one do you consider as most important, and why?

Richard Layard: There are thousands of surveys in which people have been asked how happy they are or how satisfied with life, and then attempts have been made to explain the differences between people. All have also been asked how satisfied they are with different dimensions of life, such as family life, work life, health and so on. In all of these studies, family life or close, personal relationships come out as the most important thing.

Gerhard Baumann: Health. It is only truly appreciated when it is lacking.

Jakob Kellenberger: None of them on their own. Being at peace with oneself and having a deep understanding of complex relationships also contribute to happiness, in my view.

Amlan Roy: It has varied with age. But I consider health and love the most important components of happiness. One can overcome most hardships based on good health, self-belief and love of family/dear ones.

Patrick De Maeseneire: Health is the most important. All the rest you can achieve yourself.

Giles Keating: Does the possession of money lead to happiness?

Patrick De Maeseneire: Is money important? I won't be a hypocrite about it. If you have enough, it's far too easy to say it's not important. Does it help? Yes. Is it the ultimate source of happiness? No way.

Gerhard Baumann: No. Money is frequently inversely related to happiness. The worried miser is a most unhappy person precisely because he focuses on money. However, for most people, there needs to be enough money to guarantee food, shelter and a reasonably comfortable life.

Jakob Kellenberger: Money can contribute to happiness if it's grounded in and subordinated to clear ideals. Dire poverty can become a wellspring of grave, blameless sorrow.

Amlan Roy: It most certainly does not. Most quality-of-life surveys in the US, UK and other developed countries do not show an increase in happiness levels despite the fact that GDP per capita has increased in most developed countries over the last 50 years.

Richard Layard: Anyone who says money doesn't matter is talking nonsense. Of course it matters. But, that is not the same as saying that the world would be a lot happier if people had more income, as Amlan Roy mentioned. If you take the correlation

within society of income with happiness, it is about 1.15, which isn't very high. It is also subject to diminishing marginal utility. But, if you ask people how satisfied they are with their life based on different dimensions and one is called "your financial situation," that tends to rank higher.

Giles Keating: Is success relative to other people or relative to one's own objectives that matters most?

Patrick De Maeseneire: In my thirties, I did indeed feel that it was important what others thought about me. In the meantime I've learned there is only one judge: the man in the mirror. Being able to look yourself in the eyes every morning while shaving is most important to me. Achieving what I've promised, and backing words with action are the basis for that.

Gerhard Baumann: Happiness and success are interrelated. One is not the cause of the other. Success in one's own objectives matters more than societal "success."

Jakob Kellenberger: Success can indeed evoke a sense of happiness. Appreciation of that success by others is of secondary importance for lasting happiness. One who lives mainly in the eyes of others has slim prospects of achieving that state.

Richard Layard: This is a philosophical question. I would consider that the best societies are the ones that are happiest, so happiness for me is the measure of success of a society. I would not say it is the measure of success for an individual. I think an individual's success has to be measured by the amount of happiness they generate for the world, not just for themselves. One of the main threats to happiness in the West is individualism. Or, saying your main duty in life is to make the most of yourself, which quickly degenerates into comparing your success with other people. This is a very bad ideology from which to build a happy society.

Giles Keating: Some economists try to put a dollar value on how human beings are impacted by tangible and intangible forces. Can happiness be quantified in this way?

Patrick De Maeseneire: It cannot, and it should not be quantified. Can you put a dollar amount on love? Can you put a dollar amount on the head of your children? Can we put a dollar amount on being healthy? That's ridiculous.

Gerhard Baumann: I agree. Happiness cannot be quantified in terms of dollars.

Amlan Roy: Translating utility or happiness into dollar values or



**“Is money important? I won’t be a hypocrite about it. If you have enough, it’s far too easy to say it’s not important.”**

Patrick De Maeseneire, Chief Executive Officer of Barry Callebaut



**“American-bred individualism is a cancer that threatens to spread across the world in a way that will actually lessen worldwide levels of trust and happiness.”**

Richard Layard, Founder and Director of the London School of Economics  
Centre for Economic Performance

cardinal numbers is not really very useful because of the changing framework within which any individual or subject evaluates happiness. “Keeping up with the Joneses” and Duesenberry’s “Relative Income Hypothesis” are very standard constructs in macro-consumption theory. However, these are very incomplete and inadequate representations of happiness.

Jakob Kellenberger: I find such an endeavor interesting, but nothing more. Contentment is a very internal matter.

Richard Layard: The fundamental problem of measuring happiness in units of money is that an extra dollar has a different impact on a rich person and a poor person. Therefore, there is no use in taking money as a numerative.

Giles Keating: Why is comparative income, or keeping up with the Joneses so important?

Richard Layard: There are two reasons why comparative income matters. The whole social system adjusts, so if everybody has cars, the public transport deteriorates and you need more money to move around. The main reason is that a person wants to be able to hold his head high, and to do that he must have an income that is not too different from the prevailing income in his community. I have done six studies on this, so this statement is not just speculation, this is a well-documented empirical fact.

Giles Keating: US per capita GDP is now more twice what it was half a century ago, but some studies suggest that Americans are no happier now than they were then. With this in mind, how big a role does material income play in happiness?

Richard Layard: We do know that across advanced countries, the average income level does nothing to contribute to the average happiness when measured across countries. This is certainly due to the fact that when conducting the studies people’s happiness depends not only on their own income, but on the income of others. If everyone is getting richer at the same time, that doesn’t do a lot to improve happiness when we’ve reached the level of wealth that we now have.

Amlan Roy: A certain amount of money is a necessary condition of happiness. Many would trade significant sums of money to live in a safe and law-abiding society. In isolated tribal societies untouched by modern globalization, and for many spiritual gurus, material income plays a very minor role in happiness.

Patrick De Maeseneire: Again, it’s too easy to say it doesn’t help at all, but it is not the most important source. For example,

medicine has progressed a lot, and that’s part of the consequence of the GDP growth, and being healthy is important for happiness, so it does have an influence. But communication, competition, stress have increased. The world has become flat again, according to the Pulitzer Prize-winning author Thomas L. Friedman. Meaning, increased competition has led to the rat race we are all part of.

Jakob Kellenberger: That finding doesn’t surprise me. But if per capita GDP were only half as high today as it was 50 years ago, there would hardly be a greater number of happy people. It seems likelier to me that there would be more unhappy people. Poverty is a heavy burden.

Giles Keating: Does poverty prevent individuals from being happy?

Jakob Kellenberger: Anyone venturing an opinion on that should first have spent a few years living in direst poverty. I haven’t, so I can’t comment.

Giles Keating: How important is the place of living for happiness?

Gerhard Baumann: It depends what is meant by “place of living.” A place embroiled in war does not promote happiness. A comfortable home with sufficient personal space is important for many, but not all (viz. Diogenes in the barrel or the happy clochard under the bridge). Geographic location may be important for climatic reasons, depending on a person’s tolerance for heat, cold and humidity.

Richard Layard: The physical place and climate are not very important, although studies comparing people from California with Minnesota show that both groups believe that Californians are happier. The actual results, however, prove that people from California are no happier than those from Minnesota. Society, however, is important. There are big differences in happiness between societies. This illustrates the importance of social arrangements in addition to genetics. People in Scandinavian countries, such as Sweden, come out as happier in rankings, for example.

Patrick De Maeseneire: Not a lot, as long as one has the basics. Then again, having lived in other places, living in a safe and clean environment like Switzerland does contribute to my “good” feelings.

Amlan Roy: Very important and vital. That is why cities such as Zurich, San Diego, Seattle, Wisconsin rank ahead of London, Tokyo, New York and Los Angeles as cities with better “quality

of life." It is important to note that demographic changes (e.g., people are living into their eighties) have led many to accept cities with better quality of life as places where they work and live, rather than the mega financial and business centers where people get paid more.

Giles Keating: Where do you see most differences in happiness around the world? Are some societies happier than others? Why?

Richard Layard: We can explain a great deal in the variation in the happiness of societies by things such as the divorce rate, unemployment rate and the level of trust between individuals. In a study, people were asked the question, "Do you think people can be trusted?" The answers vary from 60 percent in Norway to just 6 percent in Brazil. These differences are very important. The challenge to Western society now is that we have reached a level of material well-being where survival is no longer an issue, and now the question is how to improve our human relationships in order to reach a higher level of happiness. Creating high-trust societies is one of the most pressing imperatives. We are not being successful at this in Britain and America, where trust has halved in the past 40 years, whereas in most European countries it has increased somewhat. I think that the American-bred individualism is a cancer that threatens to spread across the world in a way that will actually lessen the levels of trust and happiness.

Amlan Roy: In some major cities in the developing world such as Johannesburg, São Paulo, Rio, Mumbai, Kolkata, we see the richest (billionaires or near billionaires) living just a few miles away from the destitute and squalor-ridden neighborhoods. Yet, some of the poorest people in Africa and Asia that I have met and seen are very happy with their families and some shelter, basic clothing and two if not three square meals a day. Note again, their expectations are not too high. Many high-achievers and rich people often later in life seek a more meaningful life and contribute a lot more to society and charity in an effort to be happier in a spiritual and non-material sense. The societies with highest number of centenarians, such as Japan and Sardinia, are happier as they have a sense of common purpose and good.

Giles Keating: Some philosophers argue that it is necessary to have experienced unhappiness in order to fully appreciate happiness. What are your thoughts on this?

Gerhard Baumann: Perhaps they are right. The contrast

between misery and bliss may illustrate to a person what it means to be happy. In the absence of such contrast, a happy life may be taken for granted and hence be underappreciated.

Jakob Kellenberger: I don't necessarily believe this is true.

Amlan Roy: To truly appreciate success, one has to have tasted failure of some sort or another and most successful people have faced up to failure and learned from it. Similarly, to really be happy one has to have experienced or closely witnessed unhappiness.

Patrick De Maeseneire: I do agree. Like I said, happiness is a combination of snap shots, so is unhappiness. I once was for months in a wheel chair because of an accident. Only then you know what people go through who always have to be in one, only then you know that the "simple" thing of being able to walk, is so important.

Richard Layard: Happiness is an experience, and even if a given situation can make you happier after a period of being unhappy, it does not mean that happiness needs to be preceded by unhappiness. Because of genetics, most people who experience long runs of happiness are those people who have not experienced long runs of unhappiness.

Giles Keating: Some researchers argue that happiness is based on genetic predisposition. What are your thoughts on this?

Gerhard Baumann: As in all things biological, genetics plays a role. The degree of heritability of happiness is not known currently, but the role of genetics in personality traits is quite significant.

Richard Layard: That is absolutely true. We have had studies of identical twins separated at birth and you can see that they are much more similar in enjoyment of life as illustrated in questionnaires, than fraternal twins or other siblings. This does not, however, mean that happiness cannot be influenced.

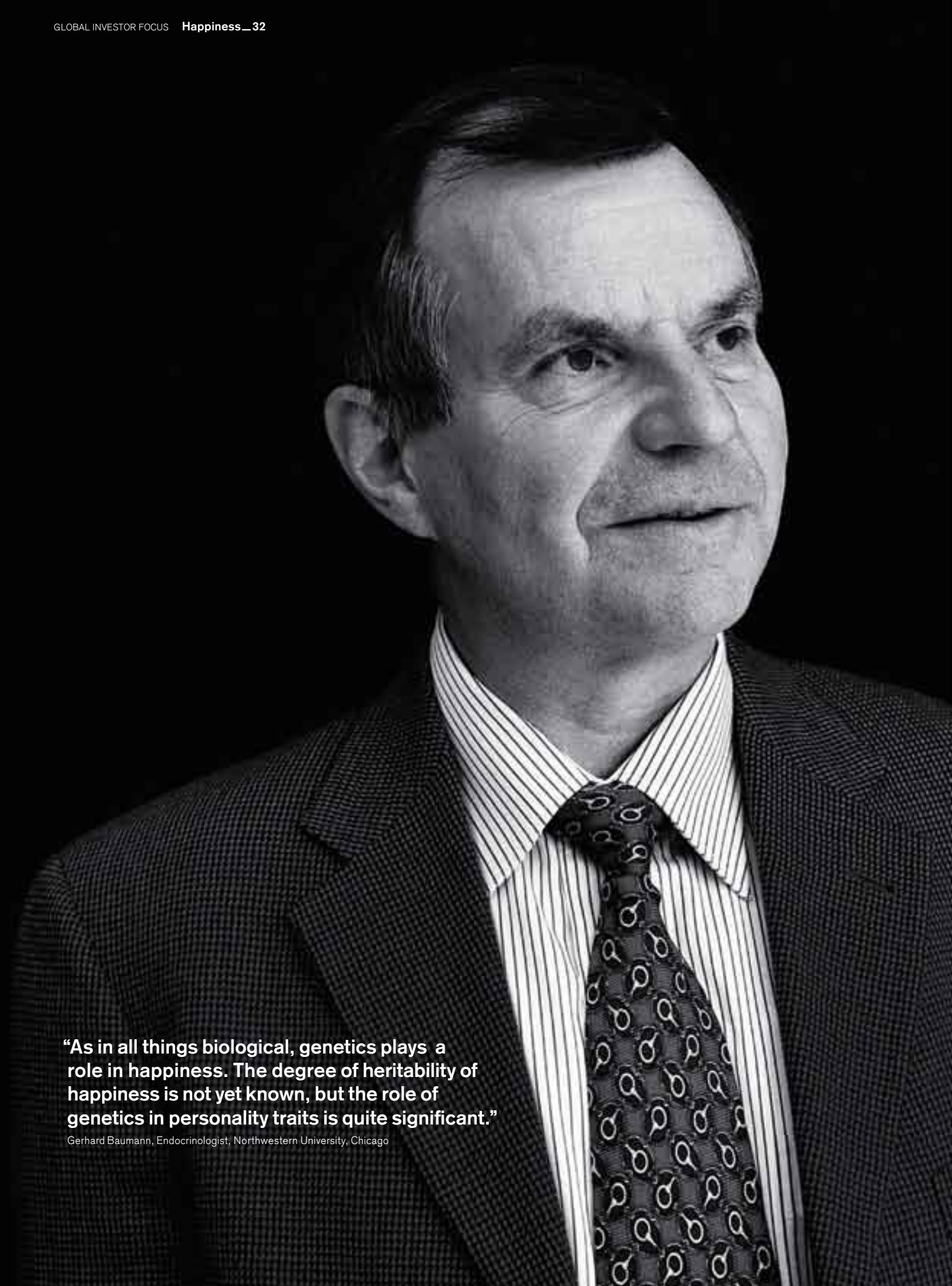
Amlan Roy: The Human Genome Project attempts to identify mapping genes which indicate greater criminal, selfish or other dispositions. While it may be fine for research to identify these traits and map them to genes, we ought to be cautious of misuse.

Patrick De Maeseneire: I do believe that genetics are important for our physics. However, I also believe that Freud was right when he said that the first five years of one's life are the most influential for one's development of character.



**“I consider health and love to be the most important components of happiness. Money can also help through bad times, but not as universally.”**

Amlan Roy, Head of Demographics Research, Credit Suisse, London



**“As in all things biological, genetics plays a role in happiness. The degree of heritability of happiness is not yet known, but the role of genetics in personality traits is quite significant.”**

Gerhard Baumann, Endocrinologist, Northwestern University, Chicago



Giles Keating: Mental illness is a major issue that impacts happiness potential. What is being done to address this and what can medicine contribute?

Gerhard Baumann: Medicine can treat mental disorders, such as depression, and can promote a healthy work-life balance through education of society. However, it is too much to ask of medicine “to increase happiness.” Happiness in society at large is ultimately a personal state of mind and a philosophy that cannot be addressed by medicine, except by treating those who are unhappy because of a mental illness.

Richard Layard: In most advanced countries, one in six people would be diagnosed by a psychiatrist as mentally ill, which means that one in three families includes someone in the household who is mentally ill. While things are being done to help people with schizophrenia or manic depression, for people with ordinary unipolar depression, or people with crippling anxiety disorders, such as agoraphobia, social phobia, compulsive disorder, panic attacks and so on, there is nothing other than pills to treat them, at least in Britain. Cognitive behavioral therapy is the most effective in the long run. I hope to see mental health as an issue at the next general election.

Giles Keating: What are the most significant unmet clinical needs? Which of those will most likely be addressed in the near future?

Gerhard Baumann: Antidepressants without side effects would be an important advance, and many improvements have been made in this area. A major unmet clinical need is obesity, which leads to lack of stamina, fitness and vitality and thereby to a physically, and probably mentally unhappy state. Drug therapy for obesity is largely ineffective, and education about food intake and physical activity must be addressed on a global scale. We all know the stereotype of the jolly fat person, who appears carefree and happy. Today, this type represents a small minority in a sea of overweight people generally unhappy with their condition.

Giles Keating: What will people spend money on in order to get/remain happy in 20 years? What are the consumption trends you identify?

Patrick De Maeseneire: Consumers live in extremes. To escape from stressed daily lives, they look to wellness cures, to extreme sports, to luxury treats, etc. People will continue to do so, but I do think that people will also consume more re-

sponsibly by consuming more fair-trade products. They will also become more conscious about the body and brain and consume more organic and healthful products. And, hopefully, they will become more conscious about the environment.

Amlan Roy: They will spend much more on services to free their time in an effort to escape the rat race. The travel sector will grow, as will health and exercise alternatives. As people live into their nineties, the concern for quality of life in post-retirement will grow as pensions increasingly become more individual plan-based than employer- or society-based responsibility. We will also see big growth in financial services based on new products in retirement real estate, and growth in global conveniences based on technology, pharma and biotechnology growth enabling us to live healthier and longer.

Giles Keating: Do you consider yourself happy?

Jakob Kellenberger: Happiness is a delicate, intricate fabric that can be worn ragged by too much talk. However, I am always thankful for the enriching life I have. I am often happy, and always prepared to fight my way out of dejection.

Richard Layard: I go up and down, but mainly up. And, I feel I've been very lucky in my temperament, in my family life and in my colleagues.

Amlan Roy: I am happier now having experienced unhappiness earlier in my life and career. I am happy thanks to the love of my family and friends, supportive bosses and work colleagues and last but not the least satisfied clients with whom I share my research.

Patrick De Maeseneire: Seeing my children enjoy themselves and being happy means a lot to me. Being independent, and capable of caring for others, is also important. I lost my mother eight years ago, and it taught me how fragile I am, how vulnerable we all are. Since that day, I've never been as happy as before, but I still have lots of very good moments and guess I am still a happy man.

Gerhard Baumann: I consider myself blessed with good health, interesting work, and a full life. Thus, I am generally quite happy. ■



**Pharmacy at the end of the 19th century:** Before the development of well-founded knowledge in chemical synthesis was available, medicines were herbs or herb extracts. Organic chemistry opened the potential to specifically develop drug molecules and to ensure that each dose would have the same effect.

# Medical breakthroughs optimize health and happiness

Possibly the most obvious way in which spending can boost happiness, is by helping people to stay healthy or to overcome illness. The enormous strides in pharmaceuticals over the last century, and particularly the last five decades, are a crucial component of this. Today, for example, drugs against pain, anxiety, depression, infections, and the contraceptive pill, influence our lives and play an important role in contributing to our happiness and lifestyle.

**Maria Custer**, Equity Analyst, Global Healthcare

Today's medicine can be traced back to its origins in the herbal medicines known to ancient civilizations, which observed and appreciated the flora diversity in their environment and used plants for food, clothing, shelter and healthcare. At that time, the development of herbal medicines was driven by observations, intuition, mystical theories or trial and error, and this expertise was transmitted from generation to generation. As time went on, each population began to methodically collect information and preserve its knowledge in herbal medicine. The cultures of Mesopotamia, Egypt, China and India had a strong knowledge of herbs medicine, as illustrated in texts found with descriptions of the use of medicinal plants. Egyptian physicians, for example, prescribed figs and castor oil as laxatives while Hindus used cannabis as anesthetics.

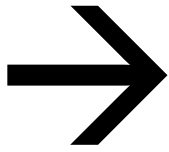
At the end of the 19th century, a large part of the drugs in the pharmacopoeia<sup>1</sup> were derived from herbal lore of ancient populations. Before the development of well-founded knowledge in chemical synthesis was available, medicines were herbs or herb extracts. Salicylic acid, for example, a precursor of aspirin, was derived from the white willow bark plant extract and morphine was isolated from the opium poppy. Prior to the discovery of antibiotics, Echinacea (from the purple coneflower) was widely used against infections. One of the drawbacks of herbs or herbal extracts was

that they contained different concentrations of the active principle, and hence the dose needed was not exact.

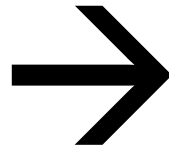
## **Organic chemistry opened the path for drugs**

After extraction from natural products, the next leap in drug development was the advance in the technology of organic chemistry during the late 1800s and the beginning of the 1900s. Organic chemistry offered for the first time the potential to develop drug molecules in a scientific way different to the "cookery" used until then and to ensure that each dose would have the same effect. At the turn of the century, some drugs could be chemically synthesized but there was significant controversy on how drugs like nicotine, curare or atropine acted as the biochemical and physiological understanding of medicine was not enough developed. The advances in organic chemistry in the late 19th century, together with improvements in biochemistry such as the receptor theory gave the base for the exciting drug development occurred in the 20th century. In 1897, Bayer's Felix Hoffmann managed to chemically synthesize pure acetylsalicylic acid (aspirin) as the first large-scale commercial drug. Aspirin powder was first distributed to physicians for their patients and became soon the number one drug worldwide. ↗

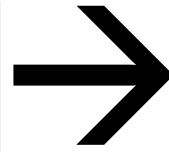
# From herbal medicine to targeted drugs



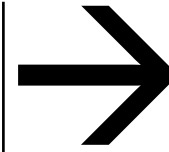
Natural products



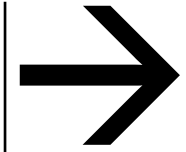
Random screening of molecules



Receptors



Biotech drugs



Pharmacodiagnosics  
Tailored medicine

1800

1897

1928

1950

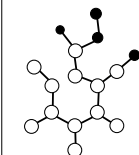
1960

1982

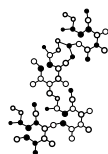
2000



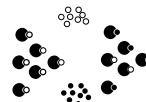
→ **Herbs** Mesopotamia, Egypt, China and India had strong knowledge of herbal medicine. At the end of the 19th century, many of the drugs in the pharmacopoeia were based on the lore of the ancients.



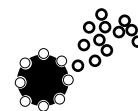
→ **Aspirin** Bayer's Felix Hoffmann managed to chemically synthesize pure acetylsalicylic acid (aspirin) as the first large-scale commercial drug. Aspirin became soon the no. 1 drug worldwide.



→ **Penicillin** By accident, Sir Alexander Fleming discovered the antibacterial effect of penicillin, one of the earliest discovered and widely used antibiotic agents.



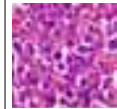
→ **Psychotropics (benzodiazepines)** In the 1950s the first antipsychotic opened a new era in the treatment of mental illness.



→ **Beta-adrenergic receptor blockers** The introduction of these in the 1960s opened the door to new, life-changing treatments of cardiovascular diseases.



→ **Synthetic insulin** The first commercialized biotechnology drug is produced by inserting the gene for human insulin in *E. coli* bacteria, which produce insulin as if it would be a bacterial protein.



→ **Targeted drugs** Improvements in medicine during the past century progressed from treating the symptoms of a disease to the development of targeted drugs treating directly the molecules of the disease.

The development of the healthcare sector has gone through tremendous change from herbal medicine to the edge of targeted drugs. Now, the symptoms of a disease are no longer the target, but rather the molecular cause of the disease.

The number of discoveries during the 20th century was huge, from the discovery, isolation, and large-scale production of insulin in the 1920s, through the discovery of vitamins and vaccines in the 1930s and 1940s, the antibiotics in the 1940s, antipsychotics that opened a new era in the treatment of mental illness in the 1950s, the contraceptive pill in the 1960s and the biotech revolution at the end of the century. Despite the scientific advances, many discoveries were driven by serendipity, as for example the discovery of penicillin. In 1929, Sir Alexander Fleming went on holidays and left a petri dish in the lab with bacteria. When he came back, he saw that a mold was growing on the dish and he realized that the area around the mold had no bacteria growing. He called the mold *Penicillium*, and the chemical compound produced by the mold was named penicillin, the first antibiotic found. During World War II, the need for antibiotics was high and penicillin was isolated and tested in animals with success.

### **DNA brought biotechnology into play**

In 1953, Watson and Crick contributed significantly to the future development of biotechnology with the deduction of the three-dimensional structure of the carrier of genetic information, the DNA or deoxyribonucleic acid.

Biotechnology opened new opportunities, not only for the understanding of causes of disease but also for a fully new production procedure of drugs. Biotechnology production allows the synthesis of very complex molecules that cannot be synthesized using traditional chemical methods. While chemical products are manufactured by traditional chemical methods (mixing, heating, distilling, etc.), biotechnology products are fabricated by microorganisms (bacteria, cell cultures, yeast, etc.). During the last three decades of the 20th century, the combination of the advances in computers and in human biology has created an immense quantity of knowledge and resources.

The first commercialized biotechnology product was human insulin in the 1980s. Today, it would not be possible to treat the more than 100 million diabetic patients worldwide using extracts from pig and cattle pancreas. Human synthetic insulin, the first commercialized biotechnology drug, was launched in 1982. For the production, the gene for human insulin is inserted in *E. coli* bacteria and the bacteria produce insulin as if it would be a bacterial protein. The in-

ulin is then extracted and purified. Following the advances in computational science and their application in life science, robots and automation have played a central role in drug discovery in recent times.

### **The future belongs to targeted drugs**

At the beginning of the 21st century, the human genome was discovered. This development flags once again the initiation of a new era for the understanding of disease and for drug development. Genes provide the patterns for proteins, and proteins are involved in many diseases, as these diseases manifest themselves at the level of protein activity. The advances in genomics and robotics (high-throughput screening) allow the study of the function and interactions of proteins (proteomics) and play an important role in the development of a new class of medicines as well as for prevention and early detection of diseases. In the future, these new medicines will use human genes and proteins to regenerate tissues that have been damaged by disease or trauma.

Improvements in medicine during the past century progressed from treating the symptoms of a disease to the development of targeted drugs treating directly the molecular cause of the disease. Despite the fact that in the short term, forecasts on genomics and bioinformatics have been subjected to unrealistic expectations, in the long run both are bringing and will most likely bring truly innovative changes for patients. And alongside the technological developments, progress is also slowly being made in addressing the problem that illnesses affecting poor people, such as malaria, have tended to be chronically underresearched. Both large charitable foundations and governments are starting to provide incentives for research in the diseases. Meanwhile, via differential pricing the pharma companies are starting to make retroviral treatments for HIV/AIDS available to low-income countries. These developments still have a long way to go but they do point the way in which the improvements in happiness that modern medicine can bring, could progressively be spread – among not only the peoples of the high-income nations, but also those all around the world. ■

<sup>1</sup> Pharmacopoeia: Drug compounder. Official authoritative listing of drugs.

# Trends

Beyond the consumerist model of happiness: Trends and investment opportunities

**Giles Keating**, Head of Global Research, **Christine Schmid**, Equity Analyst, Banks

There are many definitions of happiness. Aristotle stressed an active but spiritual lifetime. Richard Layard speaks succinctly of “feeling good – enjoying life and feeling it is wonderful,” while psychologists distinguish between circumstances that make us feel happy, like being married, and actions that boost happiness, which they call intentional activity.

However, many in the modern world focus more crudely on a consumerist model in which people aim to feel good by spending. This may seem very different from the other definitions, and yet, there are many ways in which spending can contribute to health, social life and work-life balance – and thus to happiness defined in the other ways. In the next few pages, we look at some new developments in these areas.

Health is crucial for all of us, irrespective of age and wealth. In cancer therapies, the vision of the future is to localize tumors at early stage thanks to nanoparticle-targeted drugs. Crucial for life in a different way, we look at new developments in neonatal care as demand for it surges, partly as more women have babies later in life, and as rising obesity raises the number of premature births. Less critical to life, but still vital for people’s happiness, we describe how cochlear implants and dental implants can change people’s lives. Further in the health area we look at the rising complexity in functional food – or is it appropriate to already talk of nanofood?


The second pillar for happiness in our view is social life, which has clearly changed over the last decades for everyone but in particular both younger and older people. Given the demographic development towards an aging population we focus on senior housing – a major growth area in real estate, which empowers older people

with a high degree of personal freedom. A rising demand for all the age groups is the need for help to organize the social and as well love life, which is changing the holiday offers. A cruise ship seems an ideal place to combine social integration, adventure and luxury. Our third pillar of happiness is “work-life balance” and this requires efficient time management. The latest shopping malls assist this with one-stop shopping, offering dentists, health checks, entertainment, even crèches, all on one site alongside conventional shops. At home, the last 50 years saw (mainly female) workload slashed with the arrival of efficient domestic appliances, but this is half-finished business. The next generation will be household robots doing ironing, vacuuming, cleaning, gardening and security. The Japan Robot Association (non-military domestic robots) estimates that the market is growing from currently USD 6.5 billion to more than USD 25 billion by the year 2010.


Last but not least we return to microfinance, a theme we have focused on for the last 18 months. Financial freedom is one of the pillars of happiness. By investing in microfinance, you can help to support the longer-term financial freedom of the 4.5-billion population living on less than USD 4 per day and promote microentrepreneurial activity in developing countries as well as helping people to create a more stable and sustainable income situation for themselves.

Of course, not all consumer activity contributes to happiness on the various definitions we have looked at – most notably when heavily hyped products are bought by people mainly to keep up with their peers. We believe that the products described here do not fall into that category, but instead genuinely help to boost individual satisfaction and happiness. ■


**Neonatal care**  
Page 41



**Cochlear implants**  
Page 42



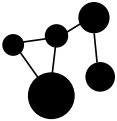
**Dental implants**  
Page 43




**Futuristic food**  
Page 44



**Cancer therapies**  
Page 40




**Microfinance**  
Page 50



**Cosmetic interventions**  
Page 45



**Holidays**  
Page 49



**Senior housing**  
Page 46



**Household revolution**  
Page 48



**Shopping experience**  
Page 47





## Cancer therapies: Fighting cancer early with nanoparticles



Cancer is the second leading cause of death in the United States. Despite this, until a few years ago, the pharmaceutical industry was unable to offer effective treatments. Recently, novel therapies for the treatment of cancer have been launched, such as monoclonal antibodies (Herceptin®, Mabthera®/Rituxan® from Roche/Genentech), which are targeted towards specific tumor types or receptors on tumors. Another monoclonal antibody, Avastin® (Roche/Genentech), inhibits blood vessel formation in the tumor and the tumor starves. In addition to advances expected in biotechnology, a related science, nanotechnology, will most likely play an important role in the future of cancer diagnosis, therapy and early detection. However, it is currently difficult to determine the exact relationship between biomarkers and clinical pathology, and to detect, in a non-invasive way,

tumors at an early stage. Targeting and localized drug delivery to the cancer cells are still key challenges and are important to selectively attack the tumor cells. Visions for the future are, for example, that nanoparticles will work as reporters to help to localize a tumor at an early stage. Recently, scientists at the University of Michigan were able to treat a tumor in mice by attaching chemotherapeutic drugs to nanoparticles. The nanoparticles containing the drug were sent to the cancer cells in the mice delaying significantly the growth of the tumor. "This is the first study to demonstrate a nanoparticle-targeted drug actually leaving the bloodstream, being concentrated in cancer cells, and having a biological effect on the animal's tumor," said James Baker, Professor of Biologic Nanotechnology at the University of Michigan. Maria Custer → Investments see page 51



## Neonatal care: Lifestyle changes increase need for new care technologies

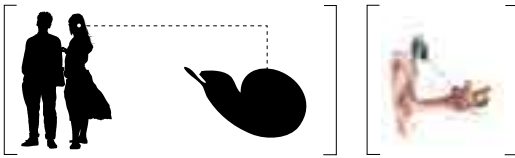


Aided by new reproductive therapies, women can start families later in life as they pursue educational and career goals. In fact, the number of babies born to women 35 years of age and older has quadrupled since the 1960s.

This trend is one of the key factors behind the rise in pre-term births (when a baby is born between 20–37 weeks of gestation, versus the normal 38–42 weeks). Over the past ten years, premature births in the US have grown three to four times as fast as the overall birth rate and now account for more than 12% of all live births. Although technological achievements in prenatal and neonatal care have increased the survival rate of preterm babies, and helped avoid long-term disabilities, much research remains to be done. Preterm birth is the leading cause of death among newborns in their first month of life. If they survive, they may face major long-term health issues, including chronic lung disease, hearing loss, blindness, and mental retardation. Some severe cases raise ethical dilemmas. Parents of a premature baby born with acute mental and/or physical deficiencies may be forced to decide whether to allow their child to die naturally or use extraordinary measures to keep their infant alive in a permanent debilitating state.

Research shows that other factors, such as diabetes, obesity, high levels of stress, hypertension, and multiple-birth pregnancies increase the risk of preterm labor. We expect the trend in preterm birth rates to persist and even to rise. As long as women continue to have children later in life, the demand for neonatal care and the associated technologies will tend to rise. Nancy Gallen → Investments see page 51





## [ Cochlear implants: Combating hearing loss for a better future ]

Cochlear implants compensate for damaged parts of the inner ear, and can help to provide a sense of sound to a profoundly deaf person. When hearing is functioning properly, parts within the inner ear transform sound waves into electrical impulses. These electrical impulses are sent to the brain and are recognized as sound by a hearing person. Cochlear implants work in a similar way sending electrical impulses to the brain. Although hearing through an implant is different from normal hearing, it allows people to communicate. Before the development of cochlear implants this kind of hearing loss was untreatable. Implants are used for people in all ages with severe to profound sensorineural hearing loss in both ears.

Implants play an important role for adults allowing them to re-connect with their families and friends and for young deaf children helping them to develop language skills and enabling them a normal social life. Together with intensive post-implantation therapy, cochlear implants can enable young children to develop language skills that are crucial for the development of social and reading skills. Children who are not able to understand spoken language tend to have poor reading skills, as the written language is a transfer of phonetic information.

Maria Custer

→ Investments see page 51



## [ **Dental implants: Healthy smiles promote happiness** ]



“The thing that goes farthest towards making life worthwhile, / That costs the least, and does the most, is just a pleasant smile. / ... It’s full of worth and goodness too, with manly kindness blent, / It’s worth a million dollars and it doesn’t cost a cent,” wrote the poet and author Wilbur D. Nesbit. Those who need dental work might not be as willing to share a smile until they feel comfortable with showing their teeth. For those who have lost one or more teeth, dental implants that permanently replace dental roots are a growing option. Besides the aesthetic benefit, the main advantage of this procedure over the traditional crowns and bridges is that implant treatments eliminate the need to grind down healthy neighboring teeth, thereby preserving healthy dental substance. The market is significantly driven by demographic trends and will most likely profit from the baby-

boomers, increasing life expectancy, and current underpenetration. Approximately 40% of the population in the industrialized countries is missing at least one tooth, but only 15% are treated, and only about 1% of potential patients are treated with implant procedures. The penetration in the market is very low because implant dentistry is not part of standard educational curriculum for dentists, patient awareness is low, and there is a lack of insurance coverage. However, the acceptance for implants is increasing as more patients learn of the benefits. The market, currently estimated at approximately USD 1.4 billion in annual sales, grew at a 16% rate p.a. between 2001 and 2004. We project the medium-term growth rate to be 15% p.a.

Maria Custer

→ Investments see page 51

PACKAGED: <b>30.05.06</b>	CONSUME BY: <b>30.11.06</b>
------------------------------	--------------------------------



## [ Futuristic food: Younger, fitter and stress-free with enhancement food ]



In recent years, the food and pharmaceuticals industries have become more closely aligned through innovations. Nutraceuticals, foods or naturally occurring food supplements thought to have a beneficial effect on human health emerged. Some of these products, for example, are geared against obesity, the prevention of heart diseases, or reduction of cholesterol adsorption. The distinction between natural and artificial food products has increasingly become a fine line. And, there is now less emphasis on taste and more on health, convenience, or even emotion. New fields of development in the food industry include so-called immortal foods, whereby the shelf life of fresh produce, or even fruits and vegetables, is extended. And, symbiotic foodstuffs contain forms of bacteria that produce vitamins and drugs directly in the digestive system.

The latest research focuses on nanofoods, which utilize nanoparticles to infuse foods with various tastes and additives, as well as certain qualities or attributes such as imperishability or consistency. That technology should make it possible, for example, to produce French fries with calories that won't be absorbed by the consumer. Other futuristic developments include enhancement foods, which improve or revitalize a human's natural abilities or attributes, for example, foods with high dose of antistress based omega 3 agents additives or antiaging ingredients based on antioxidants. The way consumers look at products, or the way those products will be sold will be decisive for the commercial success of future innovation.

Olivier P. Müller, Huong C. Belpedio, Maggie Yeo → Investments see page 51

## [Cosmetic interventions: Thirst for minimally invasive procedures grows]

Five-year trending data show cosmetic procedures up 24% from 2000 in the US. Many of those customers believe they can achieve emotional, psychological and social improvements by having plastic surgery. People who receive plastic surgery come from all economic levels and age ranges, illustrating the quest for beauty knows no bounds. The top surgical cosmetic procedures in the US in 2004 were liposuction (325,000), followed by nose reshaping (305,000), breast augmentation (264,000), eyelid surgery (233,000), and finally, face lifts (114,000).

Minimally invasive procedures are also attracting interest. They accounted for 78% of all cosmetic procedures in the US in 2003 and grew 7% further in 2004. The growth in this segment can be attributed to new injectable wrinkle fighters, intended to

avoid the need for face lifts, forehead lifts and eyelid surgeries or at least to prolong their effectiveness. The demand for hyaluronic acid injectable fillers like Restylane® and Hylaform® increased by 10 times in 2004 versus 2003. Hyaluronic acid is a naturally occurring substance found in human skin. Looking forward, this industry will probably reach a higher number of patients through more affordable treatments, combining hyaluronic acid and botulinum toxin (as is for Botox® from Allergan). We would also expect to see an increasing number of private structures specialized in plastic surgery offering a full range of services (loan payments, travel tours, health insurances or other surgery procedures, etc.) in addition to the cosmetic procedures themselves. → Investments see page 52





## Senior housing: Longer lives promote real estate growth market



The desire to live in style in a community as one gets older has spurred the demand for senior housing. Whether it's, for example, the Forum in Fort Lauderdale, Crofton Manor in Vancouver, or the senior residence Jungfraublick in Interlaken, all these facilities offer seniors the possibility to actively spend their twilight years in a common community. The aging population in the industrialized countries is a phenomenon that will pose the most significant challenges to the changing needs of society in the coming years. For instance, the proportion of the population over the age of 80 will increase by the year 2050 by a factor of 3.6 in Japan, 2.8 in North America and 2.5 in Europe.

In the USA, so-called independent living communities offer senior citizens, who desire a certain amount of independence, the necessary infrastructure for a buoyant lifestyle with common

activities. On the other hand, those seniors who still want to preserve their independence in their elder years, but also have the need for care, can choose to live in an assisted living community. In addition, continued care retirement communities (CCRC) can accommodate seniors who require slightly more intensive care. Real estate investors can reap benefits from the growth potential offered by this sector, since the companies operating these businesses are not interested in dealing with the additional task of real estate management, thus outsourcing it to specialists in the field. Healthcare real estate investment trusts (REITs), which invest in various property sectors and regions, offer a diversified investment opportunity in North America.

Eric Güller, Zoltan Szelyes

→ Investments see page 52



## The shopping experience:

Mere shopping is a thing of the past



Shopping centers such as the Darling Harbour in Sydney, the Waterfront in Cape Town, or the Centre Commercial Parly 2 in Paris offer more than mere shopping. Today, stores have to provide their retail customers with an experience in order to prompt them to visit a shopping center.

Hence, the key to successful retail real estate management is to create an experience for consumers, efficiently utilizing their time to give them a good reason to choose to return to the shopping center. Besides traditional food and clothing stores, shopping centers offer everything from fast-food take-aways to gourmet restaurants, as well as healthcare services ranging from massage parlors to medical practices and dentist offices. Cinemas and even other entertainment venues such as discos and bowling alleys as well as fitness centers are all part of a successful mix of tenants. In order to be competitive and successful in the retail real estate business in the future, the trend toward theme-oriented consumer shopping experiences plays an equally significant role as the ongoing optimization of the tenant mix. Eric Güller, Zoltan Szelyes

→ Investments see page 52

# [ Household revolution: Will robots carry the workload? ]



In the home, the last 50 years have seen the mainly female workload lessened with the arrival of efficient domestic appliances ranging from washing machines to microwaves. But, this is half-finished business. The social world is at the edge of a radical change: Firstly with the rising number of single households, many of them technical focused males, with an overall wish for an efficient time management, the demand for household robots will rise. Secondly, over the next few years the baby-boomer generation will be starting to retire. This might cause a shortage of labor force in the manufacturing process, and fuel the demand for industrial robots. More importantly, to ensure the personal freedom for the aging population, a new generation of household appliances is needed. Service robots taking the role as housekeepers or nurses, taking care of the

elderly or acting as security guards are current projects that become reality in the medium term. It is therefore no longer astonishing that the US-based Consumer Electronics Association (CEA) foresees specialized domestic robotics as a developing technology that will set off the greatest new wave in the market for consumer and entertainment electronics in the next two to three years. According to estimates by the Japan Robot Association, the current market for non-military domestic robots valued at USD 6.5 billion will likely grow to more than USD 25 billion by the year 2010.

Thanks to recent technology innovations and the market needs, this long discussed-revolution is now starting to take off.

Uwe Neumann, Marc-Antoine Haudenschild

→ Investments see page 53



80 cm







## [Holidays: Demographic developments drive the market]

The future of the holiday market looks set to be driven by main social and demographic developments: Firstly the rising number of singles and secondly the baby-boomer generation reaching retirement.

More and more single households call for services that help them organize their social and as well love life. Cruise ships, for example, used previously dominantly by older people, seem an ideal place to combine social integration and entertainment for singles. Online-dating platforms and travel service providers compete for the same client base, offering future potential of cross-selling possibilities.

The baby-boomer generation will most likely push the demand for hybrid offerings especially in the upper segment; combining hotel arrangements with clinics, academics, museum and wellness will get more importance. Safe known places to go, e.g. without terror or health risk, will profit the most, though some senior citizens are more adventurous.

As more and more people travel, individualization is becoming increasingly important, with certain luxury services becoming available via Internet booking alongside more traditional bespoke providers. Markus Mächler → Investments see page 53



## [ **Microfinance:** Minor investments with major impact



Healthy, wealthy and active people may be in a position to think “life is good to me” – but the 4.5 billion people on this globe who live on less than 4 USD a day have not been as lucky. The need for support is obvious, and the propensity to donate is likely to rise as a result. Providing the basis for financial freedom for others is a means of supporting happiness by providing help for a more stable and fair world.

That’s exactly where microfinance comes into play as it combines ideally the aspect of doing good with opening opportunities for people excluded from financial services. It pro-

vides retail banking for developing countries; in other words, providing financial services for poor, but economically active people. Access to credit and other financial services is very important since it promotes microentrepreneurial activity in developing countries and helps people create a more stable and sustainable income situation for themselves. As most of the wealthy do have a business-oriented if not entrepreneurial approach to life and wealth in particular, they like to support others by fostering self-help.

# Investments

## Cancer therapies → page 40



The market for cancer treatments will continue to be one of the most attractive ones within the pharmaceutical market over the next years. According to market observers, the oncology market will grow at 15% p.a. from USD 28 billion in 2005 to about USD 58 billion in 2010 driven by the development of innovative, targeted therapies providing clinical benefits.

The Roche Group (including Genentech) is the global leading provider of cancer care products; they have set a new standard in cancer therapies and will most likely play a leading role in the future. Other global players in the cancer market are Sanofi-Aventis, Novartis, Astra Zeneca and Eli Lilly.

**Maria Custer**

## Neonatal care → page 41



In our view, one of the ways to participate in the neonatal care sector is through the stock Pediatrix Medical Group, the largest US operator of physician services for newborns born prematurely or with complications. It also manages clinical activities at hospital-based neonatal intensive care units (NICU). Many hospitals outsource their NICU operations to Pediatrix Medical Group. Pediatrix also specializes in newborn metabolic screening tests for over 50 disorders, which if detected early, can often save an infant's life or improve quality of life. Key risks to the stock are the proportion and rate of Medicaid reimbursement (Medicaid is run by individual US states, which typically pays below the rate of private health insurers and fluctuates according to states' budgets) and the company's acquisition-growth strategy.

Other neonatal-related stocks include Discovery Laboratories, Natus Medical, and Adeza Biomedical. Because they have market capitalizations below USD 500m, they are only suitable for investors that can tolerate highly speculative and volatile equities.

**Nancy Gallen**

## Cochlear implants → page 42



Cochlear Ltd develops and markets cochlear implant systems for hearing-impaired individuals. Cochlear Ltd's shares (market cap AUD 2.9 billion) are, in our view, fairly valued after the recent outperformance driven by the product recall of its main competitor Boston Scientific.

**Maria Custer**

## Dental implants → page 43



The dental implant market is dominated by six companies, which have approximately 85% of market share and are the likely winners of the future (ranked by current market share): Nobel Biocare (31% of market share), Straumann (22%), Biomet/3i (11%), Zimmer (9%), Dentsply (7%) and Astratech (4%).

**Maria Custer**

## Futuristic food → page 44



We anticipate portfolio shifts in the large-cap food companies from commoditized low-margin, slow-growth products towards high value-added products in the health and wellness segment. We believe the accelerated trends towards functional food will have two effects. Firstly, it will further boost the portfolio shifts beyond health and wellness towards functional food. Secondly, we will see further small and mid-caps emerging in that field.

Danone with its fresh-dairy product business has already a good exposure to that trend and is highly innovative in that field. Nestlé, the world's largest food producer, is steadily building up its position in the nutrition business (5.5% of total sales in 2005), declaring the field as one of its most strategic business objectives. In the US, PepsiCo offers by far the best exposure to

# Investments

functional food (22% of sales), as it has been able to manage through changing category dynamics and achieve better-than-targeted results through a mix of innovation, core-brand marketing, productivity, channel and package management. And in Japan, Ito En has established a good position in the functional beverage segment (10% of sales) with its integrated business model.

**Olivier P. Müller, Huong C. Belpedio, Maggie Yeo**

## Cosmetic interventions → page 45



Most of the companies' revenues in the field of the cosmetic business are from private-pay patients, a segment insulated from government reimbursement policies that give full freedom for choice to patients and little pressure on pricing. Investing in the field of cosmetics is risky. There is currently an intensive phase of consolidation in this field and we expect large players to emerge.

We would recommend companies selling injectable wrinkle fighters with Allergan that sells Botox®, and Ipsen (IPO December 2005), a small French pharma company that develops and markets cosmetic drugs. Ipsen recently announced that it recovered all rights to Reloxin® (competitor to Botox®), a product in a late-stage development. Inamed specializes in collagen aesthetics and sells Hylaform®. Medicis Pharma focuses on dermatology and aesthetic medicine, and sells Restylane®.

## Senior housing → page 46



Healthcare real estate investment trusts (REIT), which focus on investing in real estate in the senior housing, medical office building, nursing home and hospital segments, exist only in the USA at present but are likely to emerge in Europe and Asia too in the medium term. Since the nursing home, hospital and medical office building property segments benefit from Medicare and Medicaid healthcare reimbursements – and are thus exposed to political risks – we favor REITs focused on senior housing. The predominant company among the REITs concentrating on senior housing is Health Care REIT Inc. The firm's real estate portfolio is valued at USD 2.6 billion and up to 92% invested in assisted living communities and Continued care retirement communities (CCRC), as well as broadly diversified. Health Care REIT Inc.'s greatest financial asset is its successful management team, with a long track record of know-how in the sector. As an alternative, Senior Housing Properties Trust offers a sharper focus on independent living communities (57%), with assisted living communities and CCRCs accounting for the remainder (43%) of the portfolio of properties.

**Eric Güller, Zoltan Szelyes**

## Shopping experience → page 47



Retail properties that are well managed and situated in appealing locations generally benefit from lower vacancy rates and more attractive returns on investment. This requires extensive know-how about the market, the tenant and consumer behavior, as well as knowledge about efficient planning and implementation. It therefore comes as no surprise that the major real estate companies focusing on retail floor space are usually the most profitable too. Westfield Group, the worldwide market leader, stands out thanks to its comprehensive know-how of the real estate sector as much as its innovative concepts.

Ranked as the largest retail real estate company, the group owns 128 properties in Australia, New Zealand, the USA and Great Britain, holding long-term rental contracts with its primary tenants. In addition, Westfield shares are high-dividend-yielding stock, with a dividend yield of more than 6%. Simon Property is the market leader in the USA, with a high-quality real estate portfolio comprising 286 properties. The Netherlands-based Rodamco Europe has developed into a predominant real estate firm in Europe. The company is impressive thanks to its attractive real estate portfolio as well as to its conservative property valuation and defensive financing strategy. For investors who wish to reap rewards from the growth and convergence potential in Eastern Europe, Meinl European Land represents an interesting – albeit fairly risky – real estate investment.

**Eric Güller, Zoltan Szelyes**

### **Household revolution → page 48**



Up to now, the fascination with human-like robots – which can take care of the household duties, or serve as receptionists or security guards – has been most strongly celebrated in Japan. This is no coincidence as Japan is clearly an advanced nation in terms of robotics as well as regarding the demographic pressure. Hence, the search for investment ideas on this development leads us primarily to the land of the rising sun. Japanese companies such as Yaskawa Electric, Fanuc, Kawasaki Heavy Industries and Nachi Fujikoshi have made a name for themselves in the business of mobile industrial robotics, spurring on the research in this field. They are best positioned to leverage their knowledge to build improved household appliances in the near future. Companies such as Sony and Honda are focusing more on domestic robots or so-called androids (human-like robots) the future segment further out. This business is currently represented as a cost center but might become a cash cow go-

ing forward. The business case is therefore currently not offering a large pure play company even if there are early signs. In November 2005, iRobot Corporation was the first pure robotics company to be listed on a US stock exchange, which should reap the most direct rewards from the growing trend in demand for domestic robots. Other beneficiaries of this trend include chip manufacturers such as Texas Instruments, Philips or Infineon. And another company, Wavcom, manufactures chipsets that enable machine-to-machine communication.

**Uwe Neumann, Marc-Antoine Haudenschild**

### **Holidays → page 49**



Carnival – the well-known cruise provider – has doubled the number of berths from around 20 to 40 thousand units in five years. We expect the growth to continue driven by singles looking for social contacts as well as the baby boomer generation looking for a safe well-known environment.

The trend for higher-value traveling has changed the travel industry. The biggest hotel REIT (real estate investment trust) is Host Marriott Corp, which holds luxury hotels flagships like Sheraton, Hyatt or Marriott and offers a more diversified investment opportunity as a single hotel group.

**Markus Mächler**

# Authors

## **Urs Dickenmann, Head Private Banking Switzerland, Credit Suisse.....05**

Urs Dickenmann has been in charge of Credit Suisse's Private Banking business in Switzerland since 1 January 2006. After joining Credit Suisse in 1986 he headed various accounting and controlling and commercial banking units. He switched to Private Banking in 1999 after being put in charge of the Lucerne branch office. In 2002 he was appointed regional head of Central Switzerland and one year later this was expanded to include West-Central Switzerland as well as the activities with independent asset managers. Urs Dickenmann was born in Zurich in 1956. Upon graduation from HSW Zurich he worked as Finance and Administration Officer for LUWA (France). He is married and the father of two children.

## **Stephen Law, Lecturer, University of London..... 12-17**

Stephen Law is Lecturer in Philosophy at Heythrop College, University of London. He is the editor of the Royal Institute of Philosophy's new journal THINK: Philosophy for Everyone. Stephen Law is also the author of a number of introductory philosophical books, including The Philosophy Files and The Philosophy Files 2 (Orion) for children and The Philosophy Gym (Headline) for adults. Stephen's next book is The War For Children's Minds (Routledge, June 2006). Stephen Law started his career as a postman, having been "asked to leave" sixth-form college. He eventually discovered philosophy and applied to university as a mature student at the age of 24. After achieving a first-class honors degree from the City University, London, Stephen studied and taught for eight years at the University of Oxford.

## **Bruno S. Frey, Professor of Economics, University of Zurich ..... 18-22**

Swiss welfare economist Bruno S. Frey is co-founder of the Council for Research in Economics Management and the Arts (CREMA) in Switzerland and acts as its research director. Frey has authored and co-written more than a dozen books, and more than 350 articles in economic, political science, sociology and psychology journals. His most recent books include Dealing with Terrorism: Stick or Carrot (Edward Elgar Publishing Ltd, 2004) and Successful Management by Motivation (Springer Verlag, 2002). He studied Economics in Basel and Cambridge (England), and has been Associate Professor of Economics at the University of Basel since 1969. He was Professor of Economics at the University of Constance between 1970 and 1977, and since 1977 has been Professor of Economics at the University of Zurich. He received an honorary doctorate in economics from the University of St. Gallen in 1998 and the University of Goteborg, Sweden, in 1998.

## **Richard Layard, Founder and Director of the LSE, Center for Economic Performance, London.....23-33**

Richard Layard is one of Britain's best-known economists and a leading expert on unemployment and inequality. He was founder-director of the London School of Economics' Centre for Economic Performance, a research center covering most areas of economic policy. He worked for the British government as an economic adviser from 1997 to 2001, and in 2000 he became a member of the House of Lords. He has written widely on unemployment, inflation, education, inequality and post-Communist reform. His most recent book, Happiness: Lessons from a New Science, was published in 2005 (Annex). He was an early advocate of the welfare-to-work approach to unemployment, and co-authored the book Unemployment: Macroeconomic Performance and the Labour Market (OUP, 1991). He was Chairman of the European Commission's Macroeconomic Policy Group in the 1980s and then co-chairman of the World Economy Group set up by WIDER. From 1991 to 1997 he was an economic adviser to the Russian government's economic staff. His current research interest focuses on happiness, aiming to achieve a unified understanding of the insights of economics, psychology, neuroscience and philosophy.

## **Amlan Roy, Head of Demographics Research, Credit Suisse..... 23-33**

Amlan Roy is a Director, Fixed Income Research, within Investment Banking Division of Credit Suisse based in London. He is responsible for the Global Demographics and the Strategic Asset Liability Management Project. He is also a senior research associate of London School of Economics' Financial Markets Group. In his prior role as emerging markets strategist, Amlan developed several global emerging markets models used by the US Treasury, UK Treasury, IMF, Board of Governors US Fed and several EM central banks. Prior to joining CSFB in 1998, Amlan spent over ten years in academia at the Boston University School of Management, the University of Iowa Business School and the University of London. Amlan has an M.A. and Ph.D. in Financial Economics from the University of Iowa, an M.B.A. in Finance & Quant. from the Indian Institute of Management in Ahmedabad, and a B.A. with Honors in Economics and Maths from St Stephen's College, University of Delhi.

## **Jakob Kellenberger, President of the ICRC ..... 23-33**

Jakob Kellenberger has been president of the International Committee of the Red Cross (ICRC) since January 2000. He was born in Heiden (Switzerland) in 1944 and entered the Swiss diplomatic service in 1974 after obtaining a Ph.D. from the University of Zurich. He held various positions in Madrid, Brussels and London from 1975 to 1984. Jakob Kellenberger was appointed head of the Economic and Financial Affairs Division of the Federal Department of Foreign Affairs (DFA) in 1982 and headed the European Integration Office in Bern from 1984 to 1992. He was appointed an ambassador in 1988. As State Secretary for Foreign Affairs he headed the Political Affairs Directorate of the DFA from 1992 to 1999, where his responsibilities included negotiations on the EEA and the bilateral agreements with the EU. Jakob Kellenberger is married and the father of two daughters.

**Gerhard P. Baumann, Professor of Medicine, University Chicago ...23–33**

Gerhard P. Baumann was born in 1941 in Basel, Switzerland. He studied medicine at the University of Basel, where he graduated with degrees in medicine and surgery in 1967. His interest in genetics was aroused during his investigations of human growth hormone in connection with pituitary tumors. Dr. Baumann has served since 1982 as Professor of Medicine at Northwestern University in Chicago, Illinois, where he has additionally held the position of Associate Program Director for the university's General Clinical Research Center since 1995. Since 1995 he has also headed the Endocrinology and Metabolism Department of the Veterans Administration Chicago Health Care System. Gerhard P. Baumann has authored numerous medical journal articles.

**Patrick G. De Maeseneire, CEO Barry Callebaut.....23–33**

Patrick G. De Maeseneire has served as CEO of Barry Callebaut, the world's large manufacturer of chocolate, since June 2002 and is also Chairman of the Board of its subsidiary Brach's Confections, Inc. He previously held various executive positions at different companies. Patrick G. De Maeseneire studied engineering at the University of Brussels, marketing management at Ghent University and business management at the London Business School and at Insead in Fontainebleau (France). He is a citizen of Belgium.

**Giles Keating, Head Global Research, Credit Suisse .....23–33, 38–39**

Giles Keating is a Managing Director and Head of Research at Credit Suisse Private Banking, and chairman of the Global Economics and Strategy Group which brings together top macroanalysts from all divisions of Credit Suisse. Before that he held positions as Head of the Pensions Advisory and Structuring Group, Head of Fixed Income Research and Economics, and Chief Economist at Credit Suisse Investment Bank. Prior to joining Credit Suisse in 1986, Giles Keating was a research fellow at the London Business School Centre for Economic Forecasting. He received his B.A. in Philosophy, Politics and Economics from St Catherine's College, Oxford University, and his M.Sc. in Mathematical Economics and Econometrics from the London School of Economics.

**Credit Suisse Research Team.....****Christine Schmid ..... 38–39**

Vice President, Banks, Financial Services.....+41 (44) 334 56 43

**Dr. Maria Custer .....40, 42–43**

Director, Pharma, Global Healthcare .....+41 (44) 332 11 27

**Nancy Gallen.....41**

Assistant Vice President, Global Healthcare.....+1 (212) 317 67 03

**Olivier P. Müller ..... 44**

Assistant Vice President, Consumer Staples, Banks..... +41 (44) 333 01 46

**Maggie Yeo ..... 44**

Japan Equities.....+65 (62) 12 60 70

**Huong C. Belpedio ..... 44**

Vice President, US Consumer Staples ..... +1 (212) 317 67 05

**Eric Güller.....46–47**

Vice President, Insurance, Real Estate ..... +41 (44) 332 90 59

**Zoltan Szelyes .....46–47**

International Real Estate ..... +41 (44) 334 83 22

**Uwe Neumann..... 48**

Vice President, Telecommunications..... +41 (44) 334 56 45

**Marc-Antoine Haudenschild..... 48**

Vice President, Japanese Equities..... +65 (621) 12 60 89

**Markus Mächler ..... 49**

Vice President, Automotive, Capital Goods, Transport ....+41 (44) 334 56 41

**Disclosure appendix****Analyst certification**

The analyst(s) identified in this report hereby certify that views about the companies and their securities discussed in this report accurately reflect his or her personal views about all of the subject companies and securities. The analyst(s) also certify that no part of his or her compensation was, is, or will be directly or indirectly related to the specific recommendation(s) or view(s) in this report.

**Important disclosures**

Credit Suisse policy is to publish research reports, as it deems appropriate, based on developments with the subject company, the sector or the market that may have a material impact on the research views or opinions stated herein. Credit Suisse policy is only to publish investment research that is impartial, independent, clear, fair and not misleading. The analyst(s) responsible for preparing this research report received compensation that is based upon various factors including Credit Suisse total revenues, a portion of which are generated by Credit Suisse Investment Banking business.

The Credit Suisse Code of Conduct to which all employees are obliged to adhere, is accessible via the website at: [http://www.credit-suisse.com/governance/en/code\\_of\\_conduct.html](http://www.credit-suisse.com/governance/en/code_of_conduct.html)

**Rating change history 21.4.2006**

Company	Rating	Date
MEINL EUROPEAN LAND	BUY	since 11.1.2006
WESTFIELD GRP (WDC.AU)	BUY	since 19.12.2005

No relevant disclosures

**Swiss American Securities Inc. disclosures**

No relevant disclosures

**Additional disclosures for the following jurisdictions**

**Hong Kong:** Other than any interests held by the analyst and/or associates as disclosed in this report, Credit Suisse Hong Kong Branch does not hold any disclosable interests.  
**United Kingdom:** For fixed income disclosure information for clients of Credit Suisse (UK) Limited and Credit Suisse Securities (Europe) Limited, please call +41 44 333 12 11. For further information about possible conflicts of interest please contact our website: [https://entry4.credit-suisse.ch/csfs/research/p/d/de/disclosure\\_en.html](https://entry4.credit-suisse.ch/csfs/research/p/d/de/disclosure_en.html)

**Guide to analysis**

Rating allocation as of 21.4.2006

	Overall	With investment interests only
BUY	46.60%	46.00%
HOLD	46.60%	47.60%
SELL	5.83%	5.72%
RESTRICTED	0.97%	0.69%

**Relative performance**

At the stock level, the selection takes into account the relative attractiveness of individual shares versus the sector, market position, growth prospects, balance sheet structure and valuation. The sector and country recommendations are "overweight," "neutral," and "underweight" and are assigned according to relative performance against the respective regional and global benchmark indices.

**Absolute performance**

The stock recommendations are BUY, HOLD and SELL and are dependent on the expected absolute performance of the individual stocks, generally on a 6–12 month horizon based on the following criteria:

BUY	10% or greater increase in absolute share price
HOLD	–10%/+10% variation in absolute share price
SELL	10% or more decrease in absolute share price
RESTRICTED	In certain circumstances, internal and external regulations exclude certain types of communications, including e.g. an investment recommendation during the course of Credit Suisse engagement in an investment banking transaction.

**Corporate and emerging market bond recommendations**

The recommendations are based fundamentally on forecasts for total returns versus the respective benchmark on a 3–6 month horizon and are defined as follows:

BUY	Expectation that the bond issue will be a top performer in its segment
HOLD	Expectation that the bond issue will return average performance in its segment
SELL	Expectation that the bond issue will be among the poor performer in its segment
RESTRICTED	In certain circumstances, internal and external regulations exclude certain types of communications, including e.g. an investment recommendation during the course of Credit Suisse engagement in an investment banking transaction.

**Credit ratings definition**

Credit Suisse assigns rating opinions to investment grade and crossover issuers. Ratings are based on our assessment of a company's creditworthiness and are not recommendations to buy or sell a security. The ratings scale (AAA, AA, A, BBB, BB) is dependent on our assessment of an issuer's ability to meet its financial commitments in a timely manner. For the AA, A, BBB, BB categories, creditworthiness is further detailed with a scale of High, Mid, or Low, with High being the strongest sub-category rating: AAA – best credit quality and lowest expectation of credit risks; exceptionally high level of capacity with respect to debt servicing. This capacity is unlikely to be adversely affected by foreseeable events. High AA, Mid AA, Low AA – obligor's capacity to meet its financial commitments is very strong; High A, Mid A, Low A – obligor's capacity to meet its financial commitments is strong, High BBB, Mid BBB, Low BBB – obligor's capacity to meet its financial commitments is adequate, but adverse economic/operating/financial circumstances are more likely to lead to a weakened capacity to meet its obligations. High BB, Mid BB, Low BB – obligations have speculative characteristics and are subject to substantial credit risk. An outlook indicates the direction a rating is likely to move over a two-year period. Outlooks may be positive, stable or negative. A positive or negative rating outlook does not imply a rating change is inevitable. Similarly, ratings for which outlooks are "stable" could be upgraded or downgraded before an outlook moves to positive or negative if circumstances warrant such an action. For details of the Credit Suisse methodology, please refer to the information on independence of financial research, which can be found at: [https://entry4.credit-suisse.ch/csfs/research/p/d/de/media/independence\\_en.pdf](https://entry4.credit-suisse.ch/csfs/research/p/d/de/media/independence_en.pdf)



**Credit Suisse HOLT**

The Credit Suisse HOLT methodology does not assign ratings to a security. It is an analytical tool that involves use of a set of proprietary quantitative algorithms and warranted value calculations, collectively called the Credit Suisse HOLT valuation model, that are consistently applied to all the companies included in its database. Third-party data (including consensus earnings estimates) are systematically translated into a number of default variables and incorporated into the algorithms available in the Credit Suisse HOLT valuation model. The source financial statement, pricing, and earnings data provided by outside data vendors are subject to quality control and may also be adjusted to more closely measure the underlying economics of firm performance. These adjustments provide consistency when analyzing a single company across time, or analyzing multiple companies across industries or national borders. The default scenario that is produced by the Credit Suisse HOLT valuation model establishes the baseline valuation for a security, and a user then may adjust the default variables to produce alternative scenarios, any of which could occur. The Credit Suisse HOLT methodology does not assign a price target to a security. The default scenario that is produced by the Credit Suisse HOLT valuation model establishes a warranted price for a security, and as the third-party data are updated, the warranted price may also change. The default variables may also be adjusted to produce alternative warranted prices, any of which could occur. Additional information about the Credit Suisse HOLT methodology is available on request.

**For technical research**

Where recommendation tables are mentioned in the report, "Close" is the latest closing price quoted on the exchange. "MT" denotes the rating for the medium-term trend (3–6 month outlook). "ST" denotes the short-term trend (3–6 week outlook). The ratings are "+" for a positive outlook (price likely to rise), "0" for neutral (no big price changes expected) and "-" for a negative outlook (price likely to fall). "Outperform" in the column "Rel perf" denotes the expected performance of the stocks relative to the benchmark. The "Comment" column includes the latest advice from the analyst. In the column "Recom" the date is listed when the stock was recommended for purchase (opening purchase). "P&L" gives the profit or loss that has accrued since the purchase recommendation was given. For a short introduction to technical analysis, please refer to Technical Analysis Explained at: [https://entry4.credit-suisse.ch/csfs/research/p/d/de/techresearch/media/pdf/trs\\_tutorial\\_en.pdf](https://entry4.credit-suisse.ch/csfs/research/p/d/de/techresearch/media/pdf/trs_tutorial_en.pdf)

**General disclaimer/important information**

References in this report to Credit Suisse include subsidiaries and affiliates. For more information on our structure, please use the following link: [http://www.credit-suisse.com/who\\_we\\_are/en/structure.html](http://www.credit-suisse.com/who_we_are/en/structure.html)

The information and opinions expressed in this report were produced by Credit Suisse as of the date in writing and are subject to change without notice. The report is published solely for information purposes and does not constitute an offer or an invitation by, or on behalf of, Credit Suisse to buy or sell any securities or related financial instruments or to participate in any particular trading strategy in any jurisdiction. It has been prepared without taking account of the objectives, financial situation or needs of any particular investor. Although the information has been obtained from and is based upon sources that Credit Suisse believes to be reliable, no representation is made that the information is accurate or complete. Credit Suisse does not accept liability for any loss arising from the use of this report. The price and value of investments mentioned and any income that might accrue may fluctuate and may rise or fall. Nothing in this report constitutes investment, legal, accounting or tax advice, or a representation that any investment or strategy is suitable or appropriate to individual circumstances, or otherwise constitutes a personal recommendation to any specific investor. Any reference to past performance is not necessarily indicative of future results. Foreign currency rates of exchange may adversely affect the value, price or income of any products mentioned in this document. Alternative investments, derivative or structured products are complex instruments, typically involve a high degree of risk and are intended for sale only to investors who are capable of understanding and assuming all the risks involved. Investments in emerging markets are speculative and considerably more volatile than investments in established markets. Risks include but are not necessarily limited to: political risks, economic risks, credit risks, currency risks, and market risks. An investment in the funds described in this document should be made only after careful study of the most recent prospectus and other fund information and basic legal information contained therein. Prospectuses and other fund information may be obtained from the fund management companies and/or from their agents. Before entering into any transaction, investors should consider the suitability of the transaction to individual circumstances and objectives. Credit Suisse recommends that investors independently assess, with a professional financial advisor, the specific financial risks as well as legal, regulatory, credit, tax and accounting consequences. The issuer of the securities referred to herein or a Credit Suisse company may have acted upon the information and analysis contained in this publication before being made available to clients of Credit Suisse. A Credit Suisse company may, to the extent permitted by law, participate or invest in other financing transactions with the issuer of the securities referred to herein, perform services or solicit business from such issuers, and/or have a position or effect transactions in the securities or options thereof.

**Distribution of research reports**

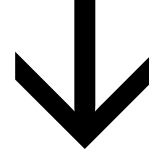
**France:** This report is distributed by Credit Suisse (France), authorised by the Comité des Etablissements de Crédit et des Entreprises d'Investissements (CECEI) as an investment service provider. Credit Suisse (France) is supervised and regulated by the Commission Bancaire and the Autorité des Marchés Financiers. **Germany:** Credit Suisse (Deutschland) AG, authorized and regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin), disseminates research to its clients that has been prepared by one of its affiliates. **Hong Kong:** This report is issued in Hong Kong by the Credit Suisse Hong Kong branch, an authorized institution regulated by the Hong Kong Monetary Authority and a registered institution regulated by the Securities and Futures Ordinance (Chapter 571 of the Laws of Hong Kong). **Switzerland:** This report is distributed by Credit Suisse, a Swiss bank, authorized and regulated by the Swiss Federal Banking Commission. **United Kingdom:** This report is issued by Credit Suisse (UK) Limited and Credit Suisse Securities (Europe) Limited. Credit Suisse Securities (Europe) Limited and Credit Suisse (UK) Limited, both authorized and regulated by the Financial Services Authority, are associated but independent legal entities within Credit Suisse. The protections made available by the Financial Services Authority for private customers do not apply to investments or services provided by a person outside the UK, nor will the Financial Services Compensation Scheme be available if the issuer of the investment fails to meet its obligations. **United States:** Neither this report nor any copy thereof may be sent, taken into or distributed in the United States or to any US person. Local law or regulation may restrict the distribution of research reports into certain jurisdictions.

This report may not be reproduced either in whole or in part, without the written permission of Credit Suisse. © 2006 CREDIT SUISSE

**You will be very happy.**



The Chinese Double Happiness symbol is a typical wedding gift to promote happiness in marriage and family life.



→ **Imprint**

Publisher

Credit Suisse, Global Research  
P.O. Box 300, CH-8070 Zurich  
Director: Giles Keating

Editors

Christine Schmid, Oliver P. Müller

Editorial support

Michèle Bodmer (Credit Suisse Publications)  
Zoe Arnold (Arnold Design)

Editorial deadline

28.04.2006

Organization

Bernhard Felder

Concept and design

Arnold Design AG, Uerikon-Zurich  
Urs Arnold, Michael Suter, Charis Arnold  
Maja Davé, Manuel Schnoz  
Monika Isler, Petra Feusi (Project Management)

Layout

Arnold Design AG, Uerikon-Zurich

Typesetting

Arnold Design AG, Uerikon-Zurich (g, e)  
gdz AG, Zurich (f, sp, i)

Printer

Feldegg AG, Zollikerberg (g, e)  
Stämpfli AG, Berne (f, sp, i)

Translations

DÜV, Zurich (g)  
UGZ, Zurich (f, sp)  
Alleva Übersetzungen, Baar (i)  
Garcia Translation Services, Gossau (e)

Proofreading

text control, Zurich (g, e)  
UGZ, Zurich (f, sp)  
Alleva Übersetzungen, Baar (i)

Copies of this publication may be ordered  
via your customer advisor; employees contact  
Netshop directly.

This publication is available on the internet at:  
[www.credit-suisse.com/research/](http://www.credit-suisse.com/research/)

Intranet access for employees of the  
Credit Suisse Group: <http://research.csintra.net>

International research support is provided by  
Credit Suisse's global network of representative  
offices.

[www.credit-suisse.com/research](http://www.credit-suisse.com/research)