

# Why does income growth fail to make us happier? Searching for the treadmills behind the paradox of happiness

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## Abstract

Several recent studies have shown that in developed countries, reported levels of happiness do not increase in line with income levels, and people are experiencing more and more time pressure. Together these findings suggest that people do not maximize happiness—they would be better off if they worked less and had more leisure time. Two treadmill effects behind this paradox of happiness have been described in the literature: the positional treadmill, the hedonic treadmill. In this paper I propose two additional treadmill effects: the multi-option treadmill, and the time-saving treadmill, which both seem to make a significant contribution to the stagnation of happiness.

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## 1. Introduction

Several recent studies have shown that in developed countries the reported levels of happiness<sup>1</sup> do not increase in line with income levels (Blanchflower and Oswald, 2004; Diener and Biswas-

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<sup>1</sup> Instead of happiness many studies also use the concepts of subjective well-being, life satisfaction or positive affect, which actually do not mean exactly the same thing (see Diener and Biswas-Diener, 2002). However, for convenience, I generally use the term happiness in this paper, as the main thrust of the presented arguments does not depend on distinguishing these concepts.

Diener, 2002; Diener and Oishi, 2000; Easterlin, 1995, 2001; Kenny, 1999; Veenhoven, 1993). On the other hand, the existing literature also suggests that people are experiencing more and more stress at work but also during their free time (Cross, 1993; Eckersley, 1999; Hochschild, 1997; Robinson and Godbey, 1997; Schor, 1999; Sullivan and Gershuny, 2001). These findings indicate that people actually behave in an economically sub-optimal way. They would be better off if they strived less for an ever-increasing income by working harder and harder and instead cared more about reducing stress. The question therefore arises: if different economic behavior makes people happier, why do not they change their behavior (Oswald, 1997)?

In this contribution I propose various treadmill effects to explain the paradox of happiness, which in this paper refers to the fact that reported levels of happiness do not increase in line with income levels once income has reached a certain threshold level. All these treadmills seem to be inherent in modern economic development and help to turn economic growth in developed countries into a rat race, where the pursuit of happiness of all individuals becomes a zero sum game on aggregate. And this zero-sum game is reflected in the empirical data indicating the stagnation of reported levels of happiness. However, people usually seem to ignore the existence of these treadmills and do not incorporate them into their decision-making process. The result is a bias against leisure time, as people overestimate the happiness derived from income and underestimate the benefits of leisure time.

Two treadmill effects, the search for status or positional goods and the importance of rising aspiration levels, are well known and have been described by many economists in the past. They result in treadmill effects that have been labeled the positional treadmill (Frank, 1985) and the hedonic treadmill (Brickman and Campbell, 1971). This paper contributes to the literature by proposing two additional treadmill effects, which also appear to be responsible for the paradox of happiness, but which have not yet been discussed so far. The multi-option treadmill describes the mixed blessing of the constantly increasing number of options to spend money and time, which are associated with economic growth. While on the one hand, a growing number of options can increase people's happiness, the overabundance of options makes choice a lot more difficult. As people try to profit from more and more options they increasingly feel the impossibility of choosing the right options and of actually enjoying a chosen option.

The second new treadmill proposed in this paper is the "time-saving treadmill". With rising income, time becomes increasingly scarce as a growing number of options meets a constant time budget. Economies in industrialized countries responded to this challenge by the development of a large variety of time-saving devices. But time-saving efforts frequently turn out to be futile because the more time-efficient certain activities become, the more people will engage in them. For example, if transport becomes faster, people will travel more frequently and over longer distances. Therefore, time-saving innovations tend to intensify the use of leisure time instead of mitigating the time pressure.

The paper is organized as follows: Section 2 summarizes some of the main results of the literature concerning the positional treadmill and the hedonic treadmill. Sections 3 and 4 present the additional treadmills proposed in this paper. Section 3 describes the multi-option treadmill, which is caused by the increasing problems related to choice and enjoyment of the existing options in a multi-option society. Section 4 presents the time-saving treadmill and explains, why time-saving technological progress largely fails to reduce stress by freeing additional time slots for leisure time. Section 5 concludes and shortly sketches possible measures to mitigate the treadmills.

## 2. Two well-known treadmills: the positional treadmill and the hedonic treadmill

A lot of recent empirical research provides evidence that individuals do not act as interpersonally independent utility maximizers as traditionally assumed in neoclassical theory. Instead people also compare themselves to relevant others and their happiness, at least partially, depends on the result of this comparison. The importance of conspicuous consumption has already been highlighted by the French jurist and economist Jean Bodin as early as in 1578 (Bodin, 1946) but the first detailed description can be found in Veblen (1899), who introduced the notion of “conspicuous consumption” in order to relate the spending on luxury goods with the goal of impressing other people. Duesenberry (1949) put the emphasis on income as people tend to compare their own income to the income of relevant others. This led to the “relative income hypothesis” and the well-known “keeping up with the Joneses” which describes the constant struggle to keep income in touch with that of friends, neighbors, or colleagues. Hirsch (1976) described the search for status by the demand for “positional goods” or “status goods”, which cannot be augmented, as their value stems from the fact that they are not available to others. The importance of status goods has also been advocated by Frank (1985, 1999), who basically interprets the production of these goods as a misallocation of productive resources, as in the final analysis, they are incapable of increasing overall happiness. This argument has been further elaborated by Cooper et al. (2001), who argue that innovative activity is increasingly directed towards the innovation of status goods, leading to an increase in measured output but to a stagnation in happiness as status goods are incapable of increasing intrinsic happiness.

But how does the search for status or positional goods actually become a treadmill? Firstly, it is impossible for everybody to outperform everybody else, as a maximum of 50% of people can be above average. Therefore, the search for status becomes a zero-sum game on aggregate (Scitovsky, 1976). Even if income grows for everybody, this does not result in increased relative income for everybody. Positional goods or status goods increase happiness only at the expense of somebody else consuming less of that good and the gains of happiness to one individual are cancelled out by the dissatisfaction to another. This fact is obvious but still largely ignored in reality. People often seem to be guided by the irrational idea that everybody can be a winner (see the examples in Frank, 1999, Chapter 10) by only looking upwards when making comparisons and by overestimating their own ability due to overconfidence (see, for example, Weinstein, 1980).

But even if an individual happens to outperform relevant others, the happiness due to the relative position is constantly eroded by income growth. A fancy car such as a new Mercedes can only serve as a status symbol for as long as few people can afford it. But with rising income levels, more and more people can buy it and the Mercedes loses its positional goods status. Therefore, people have to work harder to find an even fancier car that, again, can temporarily serve as a positional good. Displaying status to others by conspicuous consumption is a dynamic process where continuous efforts are required (by buying positional goods) just to preserve the current status in the future.<sup>2</sup>

Neglecting the positional treadmill, as it is described in this section, causes people to overestimate the benefits from relative income. Rational consumers would anticipate the reduction in their future satisfaction from relative income and consider this fact once they determine the potential

<sup>2</sup> According to Holt (1998) material goods no longer serve as accurate representations of consumer practices as they are increasingly available across all social classes. The distinction now focuses on consumption practices (e.g., lifestyles) rather than consumption objects.

happiness derived from future income. However, the feedback effects, which result in the positional treadmill, tend to be rather complex and are likely to be beyond the cognitive capacity of an average consumer. Therefore, the positional treadmill is a first explanation why people constantly strive for higher income as they believe to be able to outperform relevant others. It will also result in more stress as people try to advance their career in order to earn more money in the future at the cost of leisure time. The positional treadmill is also actively enhanced by advertisement (see, for example, Frank, 1999) and by the media (see, for example, Schor, 1999), who constantly remind many people of their relatively low status as compared to the ideal promoted by marketing campaigns and many TV programs or magazines.

Closely related to the positional treadmill is a second treadmill effect that refers to people's aspirations, which tend to rise in line with rising income. Additional income initially provides additional happiness as it enables people to buy more goods and services. But people tend to adapt to higher income by rising income aspirations. The rising aspirations, in turn, lower the happiness people derive from a certain level of income as the joy of additional consumption wears off. Rising material aspirations then lead to the hedonic treadmill (Brickman and Campbell, 1971), where people constantly adapt their aspiration levels to higher income levels. In the longer run, this causes happiness to stagnate as, according to aspiration level theory, happiness is determined by the gap between aspiration and achievement (Inglehart, 1990; Michalos, 1991), which in the context of this paper is measured as an income gap or consumption gap. And this gap seems to remain fairly constant in the long run.<sup>3</sup>

Several economists have stressed the link between rising aspirations and the stagnation of happiness in high-income countries. According to Easterlin (1974, 2001) rising aspirations are the major cause of the paradox of happiness. He concludes that subjective well-being varies directly with income and inversely with material aspirations. But material aspirations tend to increase proportionately to income over the life cycle and, therefore, measures of happiness or satisfaction shift inversely with material aspirations. This negative relation has also been emphasized by Frey and Stutzer (2002a,b, 2003). According to their definition, rising aspirations are also due to the search for status by comparison with relative others, which in this paper is treated as a separate treadmill effect.

Although it seems to be common knowledge that aspirations eventually rise in line with income people generally seem to ignore this fact when evaluating the happiness derived from additional income (Loewenstein and Schkade, 1999). They tend to overestimate the benefits from new material consumption opportunities, and only consider the immediate joy they will feel once they own a new car or a house. But this feeling of joy may subside rapidly as people get used to the new goods.<sup>4</sup> As with the positional treadmill, the hedonic treadmill is also further exacerbated by recent tendencies to raise aspirations. We are constantly bombarded with the message to keep our aspirations rising, which in some of the more extreme cases can result in the so-called burnout syndrome.<sup>5</sup>

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<sup>3</sup> Kahneman (2000) distinguishes between a rising adaptation level, which leads to the hedonic treadmill as defined by Brickman and Campbell (1971), and rising aspirations, which lead to a treadmill effect that he calls "satisfaction treadmill". In this paper I do not make this distinction and the term "hedonic treadmill", as it is used here, includes both treadmill effects mentioned by Kahneman (2000).

<sup>4</sup> Moreover, Shane and Loewenstein (1999) show that adaptation to increased wealth is especially rapid while, for example, the adaptation to new food or sexual stimulation is slow.

<sup>5</sup> The American Psychological Association (APA) defines burnout as "a state of physical, emotional, and mental exhaustion caused by unrealistically high aspirations and illusory and impossible goals."

### **3. The multi-option treadmill: overestimating the happiness derived from an increasing number of options**

In this section I propose the first of two additional treadmill effects, which also appear to contribute to the paradox of happiness. Along with economic growth we can observe a development towards a multi-choice society (Breedveld and van den Broek, 2003) or a multi-option society (Gross, 1994), which is the term I will also use in this paper. There is a constantly increasing variety of goods and services, which open new windows of opportunities for consumption, investment, leisure activities and lifestyles. The number of options has exploded on all levels ranging from simple consumption choices to major lifetime decisions and we are forced to make more and more choices. When we enter a supermarket and we want to buy a yogurt, we have to choose among an overwhelming number of flavors consisting of fruits, berries, nuts, chocolate, vanilla and, of course, all kinds of mixtures between them. If we want to invest our money we can choose among countless options of financial assets and a huge variety of funds. And when we plan our personal life there are also numerous options. For instance, we can choose among a huge number of religions or go through life without believing in God. Anything goes.

More freedom of choice, on the one hand, comes from an increasing variety of opportunities how to spend money and time. On the other hand, constraints on choices set by tradition or religion became more and more obsolete and modern individuals are the makers of their own worlds and destinies. At first sight, the availability of more options is likely to add to happiness as an increasing number of wants can be satisfied. But an increasing number of options also makes choice more difficult. The downside of “too many options” has been thoroughly examined by Schwartz (2000, 2004). He argues that, when the number of options, among which one can choose, becomes excessive, the freedom of choice turns into a tyranny of choice. People are confronted with an overwhelming array of possibilities. But there is a dark side to all the freedom related to more options as it leaves people indecisive about what to do and why. Freedom of choice is a two edged sword as on the other side of freedom sits chaos and paralysis. Therefore, according to Schwartz, it is many times more beneficial to have a more restricted and easier to evaluate set of options than countless options, which can impose considerable costs on people (see also Loewenstein, 1999).

There is recent evidence from the literature on human decision-making, which confirms the idea that more options can have a negative impact on people’s satisfaction. Analyzing consumer choice, Iyengar and Lepper (2000) found that participants in their studies were more likely to purchase exotic jams or gourmet chocolates, when they had 6 options presented to them instead of 30. And those exposed to fewer options also expressed greater satisfaction with their choice than those exposed to more options (see also Amir and Ariely, 2004). Tversky and Shafir (1992) and Redelmeier and Shafir (1995) show that adding a further option to an already existing set of options can make people worse off as the process of decision making becomes more difficult. Lehmann (1998) suggests that more options can lead to worse decisions, as in the case of too much choice people tend to resort to simple decision rules, which are not generally optimal. And research done by Beattie et al. (1994) finds that, if confronted with too many choices, people sometimes prefer it, if others make the choice for them. Based on all this empirical research, Desmeules (2002) proposes an inverted U-shape relationship between variety and the positiveness of consumption experience. Happiness increases with few options but once a threshold-level is reached, more options mean less happiness.

The constantly growing number of options on various levels results in a further treadmill effect, which I term “multi-option treadmill”. This multi-option treadmill is not of importance

in primitive economies, where only few options to spend money and time exist, and where the development of new options is likely to increase people's happiness. But the treadmill becomes the more important the more an economy develops, as income per capita can only grow if the number of options of spending money and time grows as well. New goods, services and lifestyles have to be constantly invented, as otherwise the law of diminishing marginal utility would finally put a halt to the growth of aggregate demand. It does not make sense to buy a large number of the same pairs of the shoes. But if there is a choice among an increasing variety of different pairs of shoes, you may always feel tempted to buy another pair, as the former first lady of the Philippines, Imelda Marcos, has proven so vividly with her collection of over 1000 pairs of shoes. We only continue to spend more money every year if there are new products, which promise to provide us even more happiness or satisfaction than the already existing products.

But as people try to profit from more and more options they increasingly feel the impossibility of choosing the right option and of actually enjoying a chosen option. On the one hand, the emergence of the multi-option society freed people from traditional constraints, which used to limit the number of available options. But on the other hand, it created new constraints on choice and on the enjoyment of chosen options, which become the more pervasive the more options exist. These constraints are as follows.

### 3.1. *The information constraint*

The existence of more options requires the availability of more information about these options, as otherwise it is impossible to make rational choices among existing alternatives. But gathering an increasing amount of information also requires more time and gives rise to other search costs. This information constraint has become a pervasive phenomenon in current multi-option societies, as it is virtually impossible to stay informed about most of the existing options (see, for example, [Etzioni, 1989](#)). Just to stay fully informed about the features of all currently available cars, notebooks, mutual funds or cell phone deals would already require a full time job. As the number of options grows, the effort and time required to make an optimal choice escalates as well ([Schwartz, 2004](#), p. 48). Therefore, people are usually not able to make rational choices among all existing alternatives, which require full information. They are forced to apply simpler but more feasible decision rules as already described by [Simon \(1976\)](#), who came up with the concept of "satisficing". According to Simon, people limit consideration in decision making to a subset of options they deem good enough given the situation and their resources. Satisficing may be interpreted as an optimal strategy to deal with too many options ([Schwartz, 2004](#), Chapter 4), but it includes the risk to miss out on the best option ([Loewenstein, 1999](#)).

And the more information there is available, the more the information constraint tends to plague people in the multi-option society. The currently pervasive information overload (see, for example, [Schrage, 1999](#)) leads to constantly higher search costs for filtering out the relevant information. Having too much information can be as dangerous as having too little ([Hahn et al., 1992](#)). Among other problems, it leads to an overabundance of low quality information ([Shenk, 1997](#)) and paralyzes analysis by making it far harder to find the right solutions, which results in the so-called *information fatigue syndrome* ([Reuters, 1996](#)). In spite of having a lot of information, many people feel severely constrained by never having "accurate information" about the choices they should make.

### 3.2. *The mental accounting constraint*

Even if we are able to gather all the relevant information for a certain decision how to spend money or time, it can be difficult to act on this information, as we are not sure about the amount of happiness (unhappiness) or satisfaction (dissatisfaction), which is associated with choosing a particular option as compared to choosing other options. First, we have to consider the immediate joy or pain associated with choosing a particular option. But for many decisions we also have to consider our future feelings, which we expect to be associated with choosing a particular option (including anticipatory joy or fear). But these feelings are many times highly uncertain, and most people are not very good in predicting the future joy they will derive from spending money and time in a particular way (see, for example, Gilbert and Ebert, 2002; Gilbert et al., 2002; Herrnstein and Prelec, 1992; Loewenstein and Schkade, 1999). Our cognitive capabilities are limited and, therefore, we usually face a mental accounting constraint, whenever we try to evaluate the costs and benefits of a large number of available options, as we are unable to set up proper mental accounts. This term goes back to Tversky and Kahneman (1981) and Kahneman and Tversky (1984) and refers to a process of mentally categorizing available options, so that they can be jointly evaluated.

The more options are available, the more people feel the mental accounting constraint and the more they are prone to make irrational and non-optimal decisions, which do not make them happy in the future. This is especially the case, when there are no clear criteria according to which one alternative is superior to another (Shugan, 1980), when they feel they lack expertise in a particular domain (Heath and Tversky, 1991) or when decisions are characterized by difficult tradeoffs (Loewenstein, 1999). Moreover, people tend to focus their decisions on absolute economic pay-offs and play down non-economic concerns (Hsee et al., 2003), which are not measurable in monetary terms. For instance, they have a tendency to neglect the importance of social relations, although their future happiness may crucially depend on it (Bjørnskov, 2003; Lane, 2000, Chapter 6).

### 3.3. *The time constraint*

A third constraint that contributes to the multi-option treadmill is the time constraint that limits the number of options, which we can actually enjoy, or as the adage goes: “so many options, so little time.” We experience an increasing income combined with an accelerated multiplication of options, which, however, meet a constant time budget. This phenomenon, which has also been labeled “time squeeze” or “time famine” is well known in the literature (see, for example, Cross, 1993; Hochschild, 1997; Linder, 1970; Robinson and Godbey, 1997; Schor, 1999). The pioneering work in this respect is “The harried leisure class” by Linder (1970), who provides detailed descriptions of how leisure time becomes increasingly harried as more and more tasks have to be fulfilled within the same amount of time leading to an acceleration, intensification and fragmentation of leisure time. We could engage in so many leisure activities, could pursue so many different carriers and go on so many shopping tours, but time limits the number of options, we can actually take advantage of. Whenever we make a decision to choose one option, we have to give up other options, which represent the opportunity cost of choosing a particular option. And the more and better options exist, the more and better options we have to give up, whenever a choice is made. In other words, the opportunity costs of making a choice raises with the number and the quality of the available options, and the joy of being able to choose among more options is accompanied by the sadness over an increasing number of forgone options.

The opportunity costs of choosing a particular option are reinforced by post-decisional regret or post-choice discomfort, which is a well-known phenomenon in consumer research (see, for example, Carmon et al., 2003; Carmon and Ariely, 2000; Tsiros and Mittal, 2000). When consumers select one option, they effectively lose the possession of all the other options, which yields a feeling of discomfort and an increase in the attractiveness of the forgone options. The feeling of discomfort appears to be the greater, the more options exist, the higher is the attractiveness of the forgone options, the more the options are alike, and the more freedom of choice consumers experience (Tsiros and Mittal, 2000). The more people face negative consequences of choices they have made themselves, the more regret they tend to feel afterwards as shown by Loewenstein et al. (1999) in the case of investment decisions for retirement. Post-choice discomfort also helps to explain why people always have a certain preference for status quo options, as these options tend to generate the least amount of regret (Simonson, 1992).

Overall, the increase in options is not likely to increase happiness any further once the number of options has reached a certain threshold level. This threshold level may be closely associated with the threshold level of income, beyond which income does not increase happiness. As the underlying reason for this stagnation in happiness I have proposed a multi-option treadmill emphasizing constraints set by information, mental accounting and time. Although the economy constantly produces new and better options, which promise to increase our happiness, the number of options, which we can actually enjoy, tends to stagnate once the threshold level is reached. On the one hand, an increasing proportion of income and of time has to be spent on gathering, filtering and evaluating information in order to choose among an increasing number of options (the information constraint). But even if we manage to collect all the relevant information, there are many situations, where we are still unable to make optimal decisions due to the mental accounting constraint and the time constraint. The mental accounting constraint is due to the lack of a proper mental evaluating system to assess the potential contribution of particular options to our happiness. And the time constraint describes the fact that time limits the options that we can actually enjoy, as an increasing number of options meets a constant time budget. Therefore, the multi-option society is also likely to result in more stress even during leisure time. This point will be further elaborated in the next section.

#### **4. The time-saving treadmill: overestimating time-saving opportunities**

The time-saving treadmill is closely connected to the time constraint that was mentioned in the previous section on the multi-option society. “In today’s economies there is an ever-increasing amount of buying amidst an ever-increasing amount of purchase options, amidst an ever-increasing amount of stress. Amidst an ever-decreasing amount of discretionary time.” (Mick et al., 2004). As time becomes increasingly scarce in relation to the growing number of options, the opportunity costs of time increase. But the opportunity costs of time also rise because wages increase more or less in line with income, and the higher is the income level in a country, the higher is also the value placed on non-work activities (see, for example, Button, 1993, pp. 52–58) at least for the working population. Therefore, there are many efforts to save time by inventing and using time-saving devices. Of course, unemployed people often face the opposite problem of having too much time but not enough goods, which is the typical situation in a developing country. But here we focus on the majority of the people in industrialized countries, who are part of the working population.

The time-saving treadmill offers an explanation why time pressure and stress are persistent phenomena in spite of the overwhelming time-saving technological progress, which occurs along with economic development. These efforts should actually help us to free time for activities that



we really enjoy and to make our lives more comfortable. Recent research by [Anderson \(2004\)](#) with data from six countries (Bulgaria, Germany, Israel, Italy, Norway, UK) shows that the only variable that made a significant positive contribution to the quality of life in all of these countries is a variable called “change in free time to do what I want”. But in many circumstances time-saving efforts seem to be unable to reduce stress as they do not result in time-savings as planned (see also [Scherhorn, 2002](#), p. 103). Instead, they result in rebound effects (see below) or an intensification of time use, which undermine their stress reduction potential.

Time-saving technological progress increases “time efficiency” or “time productivity” of performing certain activities so that we can do more within the same time. Of course, this productivity increase is a well-known fact in growth theory, and it is discussed there under the label of a rising “labor productivity”. But we have also witnessed enormous progress in “time efficiency” outside of the working place at people’s home ([Becker, 1965](#)). “Taylorizing home” by buying time-saving goods and services has become a major objective within many households ([Hochschild, 1997](#), pp. 197–238). In his seminal article, [Becker \(1965\)](#) mentions several examples of increasing time efficiency through time-saving innovations: supermarkets (saves shopping time), automobiles (saves time spent on transport), telephones (saves time on visiting people’s home) and electric razors (saves time on shaving, which before was high because men used to go to the barber’s shop for this purpose).

But did any of these innovations result in actual “time-savings”? Do people need less time for shopping? Do people need less time for transport? Do people spend less time on the phone than they previously spent on visiting their friends’ home? Do men spend less time on shaving? The only time-saving innovation that resulted in actual time-saving is the electric razor, and men in fact, need less time today for shaving than in the old days, when they had to go to the barber’s shop. There are some natural limits to the activity of “shaving”, which limit its expansion. It does not make sense to shave more than maximally twice a day. Therefore, the time-saving potential of the electric razor could be realized. But the electric razor is rather the exception than the rule.<sup>6</sup>

Time surveys clearly indicate that all other time-saving innovations mentioned by [Becker \(1965\)](#) did not result in time-savings. People go shopping more than ever. For example, the time for shopping has increased from 40 min each day in the 1960s to 70 min each day in the 1990s in the UK ([Hewitt, 1993](#)). People travel more than ever, as will be shown on in more detail below. And people call more than ever and the average time spent on the phone has typically increased by about 100% in European countries just between 1985 and 1994 ([Garhammer, 1999](#), p. 168). The underlying reason for the failure of realizing the time-saving potential of supermarkets, automobiles and telephones can be found in people’s reaction to these innovations. They expanded the activities on which they were supposed to save time. There are no natural limits to shopping, traveling and calling, as there are always more things to buy, more destinations to be reached and more things to say on the phone.

This frequently observed phenomenon of an expansion of activities, whenever new time-saving innovations become available, has been described as a rebound effect with respect to time ([Binswanger, 2001, 2004](#)). Time-saving innovations make certain activities cheaper in terms of the opportunity costs expressed in time. For instance, we need less time for traveling a certain distance, whenever transport becomes faster and we need less time for having a conversation

<sup>6</sup> Dish-washers and microwaves are other examples of time-saving innovations, which actually helped to save time in the kitchen, as we do not want to eat more, just because preparing meals has become more time efficient (see [Lebergott, 1993](#), p. 51).

with a person in a different location, when we use the telephone instead of visiting her. Time-saving innovations lower the “price” of traveling and communicating as we have to forgo less time for other activities. But due to this price decrease, people will engage more in traveling and communicating. If transport becomes faster, people will travel more often and over longer distances as mobility has become cheaper. And if contacting people becomes more time efficient through the use of telephones, more conversations will be held, as communicating has become cheaper as well.

The best documented rebound effect with respect to time-saving innovations concerns people’s traveling activities. In 1981 Zahavi et al. proposed that, on average, people spend a fixed amount of their daily time budget traveling (Zahavi et al., 1981). Subsequently, the “constant travel time hypothesis” has become a frequently debated issue among transport economists and numerous empirical studies have been done on this subject. Examining a great number of these studies from throughout the world, Victor and Schafer (2000) find that, on aggregated levels (including all modes of transport for all traveling purposes such as commuting, business travel, shopping, holidays, leisure activities), the constant travel time hypothesis holds over a wide range of income levels, geographical and cultural settings, and time scales. No matter whether people live in Tanzania or in the US, they travel about 70 min every day. But while this traveling is still mostly done on foot in Tanzania, Americans spent the largest portion of these 70 min in their car. And the daily distance traveled in Tanzania is just a few kilometers compared to a distance of 60 km in the US. The constant travel time hypothesis implies the existence of a large rebound effect. Consequently all of the time-saving potential of time-saving innovations with respect to transport tends to be lost as people offset the increasing time-efficiency by driving more and larger distances, so that the daily travel time always remains constant.

Also some time-saving innovations with respect to traditional housework are associated with a substantial rebound effect. Take the modern electric washing machine, which was invented in 1925, as an example. It certainly increased the time efficiency of washing if compared to the previously used wash boards. However, people adapted to this innovation by changing their clothes much more often than before. While it was customary to change shirts only once a week on Saturday until the beginning of the 20th century, the washing machine allowed for shifting the average norm of hygiene to a much higher level (Garhammer, 1999, p. 393; Vanek, 1974, p. 117). Nowadays, people tend to change clothes every day or even more often and, consequently, a large part of the time-saving potential of the washing machine got lost because we do a lot more washing than our ancestors. The largest time-savings in washing seem to have been realized by the invention of disposable diapers, as washing diapers amounted for a large portion of the laundry that previously had to be washed by housewives (Lebergott, 1993, p. 60).<sup>7</sup>

Also the recent technological progress in information and communication technologies provides important examples for time-saving innovations, which do not result in actual time-saving, as there are no natural limits to the expansion of the exchange of information. Nowadays, we can produce, exchange, gather and process information with a much higher speed than only a

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<sup>7</sup> If we look at the overall impact of domestic time-saving innovations on time spent on traditional housework (meal preparation, cleaning, laundry, grounds care and some other activities) it is unclear, whether it has resulted in actual time-savings, as the results depend on the exact definition of housework and on the empirical methodologies employed (analysis of cross-sectional differences versus the analysis of historical changes). Vanek (1974), Schor (1991) and Bittman et al. (2004) argue that housework has remained more or less constant in spite of the increased use of time-saving devices, while Gershuny and Robinson (1988) and Gershuny (2004) report an overall decline in time spent on housework in the second half of the 20th century.

few decades ago. But time-saving innovations with respect to information and communication technologies did not result in actual time-savings. For example, the use of e-mails, which is more time-efficient than sending letters, induces people to send more messages than they ever would have sent by mail. Therefore, the time-saving potential of the innovation “e-mail” is lost because of an increase in the exchange of information. A recent survey by Greenfield Online shows that e-mail is using a major portion of employee time. Seventy-four percent of workers said that they check their e-mail up to five times a day. Eleven percent checks between six and ten times a day, while 8% admitted to checking their e-mail more than 15 times each day. But nobody would have checked a traditional mail box several times a day as mail was just delivered once.

And a similar development can also be observed if we analyse the use of the internet. The internet substantially increased the time-efficiency of finding information on a specific subject. But it also induced people to “surf” a lot, which again counterbalances the time-saving potential of the internet. For example, “misuse” of the Internet among employees is a serious concern among managers. In one survey conducted among America’s top 1000 companies, 55% of executives revealed that they believe that time spent surfing the Internet for non-business purposes is undermining their employees’ effectiveness on the job (Robert Half International, 1996). New monitoring devices used to track Internet usage helped one firm discover that only 23% of its employees’ usage was business-related (Machlis, 1997). And in one American university, an investigation was held to find out why normally successful students had recently been failing, and thus dismissed from the university. It was found that 43% of these students failed due to extensive patterns of late night log-ons to the university’s computer system (Brady, 1997, p. A1). Overall, the rapid technological progress in information technology induced the searching, production, exchange and consumption of more and more information, which is a major cause of the information overload mentioned in Section 3.

But even time-saving innovations, which result in actual time-savings with respect to certain activities, frequently do not lead to a reduction in stress. They result in an intensification of time use, which works against stress reduction, as was already described by Linder (1970). He emphasized the increasing stress caused by this intensification of time use by shortening many activities. For example, eating in fast food places, which may be interpreted as a further time-saving effort, saves time on eating lunch and it is certainly successful in this respect. The lunch hour seems to be a thing of the past and the average time is now half an hour in the UK (The Independent on Sunday, 29. 1. 1995) and similar trends can be observed in other countries as well (Garhammer, 1999, pp. 383–386; Hochschild, 1997, p. 214). But from a broader perspective, the time saved on eating lunch is not likely to result in less stress, because shortening the lunch hour also prevents people from relaxing at midday and consequently they need more time for relaxing after work in order to maintain the previous quality of life. Being exhausted after coming home, people are most likely to spend the saved time with respect to eating lunch for additional TV watching, as they have no more energy to do anything else.

Summing up, along with rising income, time becomes increasingly scarce as a growing number of options meets a constant time budget, which causes the opportunity costs of time to rise. And additionally, opportunity costs of time also rise because of the increase in wages. Economies in industrialized countries responded to this challenge by the development of a large variety of time-saving devices. These time-saving efforts are supposed to counterbalance the stress, which follows from the increasing scarcity of time, and which has become a prevalent phenomenon over the last decades. However, these time-saving efforts rarely result in actual time-saving. Instead, people react to time-saving innovations by expanding the activities, which have become more time efficient (rebound effect), and they have to deal with an intensification of time. But generally

people do not seem to be aware of the time-saving treadmill and, therefore, they overestimate the happiness derived from income for one more reason. They neglect the described secondary effects of time-saving efforts, which are the underlying causes of the time-saving treadmill. If people would correctly anticipate the stress, which is associated with squeezing leisure time, they would try to prevent leisure activities from becoming too efficient. But instead people seem to put a lot of faith in time-saving efforts, which, however fail to create new time slots in daily life.

## 5. Conclusion

Empirical evidence strongly suggests that, on average, people in developed countries do not actually maximize happiness. It seems that many people would be better off if they had more free time but less income. But somehow people are always guided by the idea to become happier by earning more money and to avoid stress by relying on time-saving innovations, although these ideas never materialize. Therefore, the economies of developed countries turn into big treadmills where people try to walk faster and faster in order to reach a higher level of happiness but in fact, never get beyond their current position. On average, happiness always stays the same, no matter how fast people are walking on the treadmills. The treadmill is used as a metaphor for the endless pursuit of more happiness by striving for more income, which leads to more income but not to more happiness. This has also been labeled the “paradox of happiness” and in this paper I tried to uncover the economic logic behind this paradox by identifying four different treadmill effects.

As pointed out in this paper, two of these treadmills are well-known in the literature: the positional treadmill and the hedonic treadmill, which describe how people’s concern about status and rising aspirations keep happiness from rising along with income. However, there are further treadmills at work, which also make a substantial contribution to the paradox of happiness. I have termed these treadmills multi-option treadmill, and time-saving treadmill, respectively. The multi-option treadmill explains why the emergence of more options to spend time and money does not add to people’s happiness beyond a certain threshold level. And the time-saving treadmill captures the fact that time-saving technological progress fails to mitigate time pressure in people’s life. Although they have been treated as separate phenomena in this paper, the treadmills are many times interrelated and also tend to reinforce each other.

All the treadmills are the result of collectively non-optimal economic behavior that becomes prevalent once a country has reached a certain stage of development. People do a lot of things that are smart for one but dumb for all (Frank, 1999). Without incorporating the knowledge about the collective treadmills into the individual decisions about the allocation of time and money, the negative effect of the treadmills on people’s average happiness cannot be mitigated. But this is not an easy task. On the one hand, the treadmills are quite complex mechanisms and difficult to anticipate in concrete situations. And on the other hand, there is often sort of a prisoner’s dilemma, which keeps people from changing their behavior. For example, US lawyers now work harder than ever although the majority of them would like to work shorter hours for less pay (Landers et al., 1996) But the lawyer who first proposes this, will put himself into a disadvantage, as this can be felt as lack of commitment to his law firm. Therefore, all lawyers continue to work hard, although most of them would prefer to work less.

Given these difficulties, some economists think that policy measures are necessary in order to mitigate the treadmills, as they result in a huge waste of economic resources. Frank (1999) strongly advocates a progressive consumption tax targeted at cutting down the consumption of luxury goods, which is the driving force behind the positional treadmill, and a similar idea can also be found in Layard (2003). These proposals certainly merit further discussion but, additionally,

there is also a substantial potential for the mitigation of the treadmills concerning individual behavior and the organization of work. On an individual level, there is room for improvement in mental accounting. For instance, when facing a choice among a large variety of options, it is many times better to go for “good enough” instead of going for the best, as people, who act according to this rule (so called satisficers) appear to be happier than people who are determined to make only the best choices (Schwartz, 2004, Chapter 4).

Concerning the organization of work there appears to be a substantial potential of stress reduction by freeing work from some of its anachronistic temporal and spatial constraints. In spite of the enormous technological progress concerning information technologies, teleworking is still surprisingly rare and working hours could be organized in much more flexible ways (see, for example, Breedveld and van den Broek, 2003, Chapter 5). Furthermore, the currently pervasive ranking mania, which induces people to constantly compare themselves with relevant others, also tends to intensify the treadmills. Ranking efforts should be curbed instead of promoted in many domains of life, as they keep people from ever being satisfied. Successful mitigation of the treadmills requires a mix of remedies ranging from individual improvement to policy measures.

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