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Postprint / Postprint
Zeitschriftenartikel / journal article

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Accepted Manuscript

Title: Is man doomed to progress?

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Please cite this article as: Senik, C., Is man doomed to progress?, *Journal of Economic Behavior and Organization* (2007), doi:10.1016/j.jebo.2008.03.004

Is man doomed to progress?

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May 23, 2007

ABSTRACT

This paper is dedicated to the empirical exploration of the welfare effect of expectations and progress *per se*. Using ten waves of the *Russian Longitudinal Monitoring Survey*, a panel household survey rich in subjective variables, the analysis suggests that for a given total stock of inter-temporal consumption, agents are more satisfied with an increasing time-profile of consumption: they seem to have a strong "taste for improvement". This contributes to qualify the "Easterlin paradox" that income growth does not make people happy.

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People have a "gestalt" notion of an ideal distribution of outcomes in time (Camerer and Loewenstein 2004).

1. INTRODUCTION

Do past and future events affect current feelings of utility? After decades of tests and discussions of the discounted utility model, with the hindsight of field data and experiments, the assumption of separability between different sequences of utility has been breached. Beyond hyperbolic discounting, many anomalies regarding the relation between time, decision and utility are now well established. In particular, "behavioural economics" (e.g. Camerer and Loewenstein 2004) acknowledge the possibility of inter-temporal spillovers of utility (i.e. the anticipated or retarded influence of events on individual well-being). By accepting this proposal, one is using a notion of utility that is not defined uniquely as a value attached *ex ante* to a decision, by comparison with other choices, but as an experience, specifically a mental state that includes emotions[1].

How do lags and leads enter into current utility? Past consumption or past utility is most often taken to exert a negative impact over current satisfaction because of benchmarking effects

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[1] I refer to Kahneman et al. (1997) for the discussion of the difference between decision-utility and experienced-utility.

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such as adaptation[2] (Frederick et al. 2002) and reference point effects[3]. As opposed to the rich literature devoted to adaptation, the positive continuing effect of past consumption has been rarely documented, except as memory utility (Kahneman 2003). Studies in child psychology could certainly provide illustrations of the benefits of an early accumulation of an initial "stock" of happiness. A recent paper by Graham and Oswald (2006) develops the notion of "hedonic capital" as a stock on which individuals can draw to smooth bad life-shocks

Concerning the effect of the future, the literature has recently accumulated evidence of "anticipatory feelings" (Caplin and Leahy 2001) such as dread, savouring, hope and anxiety. The idea is that agents experience in advance the utility of future events (e.g. surgery operation or having dinner with a glamorous partner). The intuition dates back to the origin of economic thinking. *"three distinct ways are recognisable in which pleasurable or painful feelings are caused: (1) by the memory of events, (2) by the sensation of present events, (3) by the anticipation of future events"* (Bentham, quoted by Loewenstein 1987, p 667). However, future events can also exert a negative contrast effect if one is impatient to enjoy an expected event that, by contrast, makes the present dull. A prisoner about to be released from jail is likely to experience this type of negative anticipatory feelings.

The consequence of inter-temporal spillovers of utility is that the time profile of events matters. In particular, both adaptation and anticipatory feelings mean that individuals are more satisfied at each moment if they see their dynamic consumption trajectory as a rising one. Indeed, with aspirations based on past consumption they enjoy consuming more than yesterday, and because of savouring they enjoy the perspective of a future improvement. In sum, they enjoy progressing[4].

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[2] Adaptation is sometimes declined in two versions: hedonic treadmill and satisfaction treadmill. "Hedonic treadmill" refers to adaptation to a latent pleasure variable (say income), whereas "satisfaction treadmill" invokes adaptation to a certain level of satisfaction, i.e. the notion of a changing aspiration level (in other terms, satisfaction itself becomes an argument of satisfaction).

[3] Helson (1947) defines adaptation as the diminished responsiveness to a repeated or continued stimulus. In a model of rational addiction à la Becker and Murphy (1988), adaptation means that current utility is a decreasing function of the stock of accumulated past consumption.

[4] If agents expect adaptation to take place in the future, it constitutes an additional argument for preferring increasing sequences.

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This paper tries to provide empirical evidence of this phenomenon. It illustrates the fact that acknowledging or expecting an improvement in one's material situation is a motive of life satisfaction. Its main claim is that, *ceteris paribus*, for a given stock of cumulated inter-temporal consumption, people are happier when they experience a progression in their standard of living than when they consume the same stock, but without a progression. The principal challenge of this work is to show that these results reflect of the impact of progress *per se*.

1.1 Why isn't it trivial?

Isn't it trivial that progressing or expecting to progress influences happiness? Although this idea is very intuitive, it is in contradiction with some basic principles of economic thinking.

First, classically, economists consider that individuals maximize their inter-temporal utility, but they assume (for simplicity) that each period's experienced utility depends only on the contemporaneous consumption flow (separability of time sequences).

Second, when agents are supposed to be impatient (when they make choices that maximize their inter-temporal utility), they are supposed to value the flows of current consumption at a higher rate than the same flow of consumption available in, say, two years' time. In other words, they have a preference for the present. This is completely at odds with the assumption of savouring and of a preference for increasing time profiles of consumption. As pointed by Frederick et al. (2002), Caplin and Leahy (2001) and Köszegi (2005), anticipated utility gives rise to apparently negative rates of discounting of the future.

Third, consumer theory considers that agents optimise their consumption over their life cycle, which leads them to smooth their consumption profile; if they are not financially constrained, they borrow and save in order to equalize the marginal utility of consumption at each period, but this most often does not lead to a rising time-path of consumption.

Hence, the welfare influence of pure informational phenomena such as expectations are not usually acknowledged by standard economic modelling, which does not allow expected future improvement to influence immediate welfare directly.

It is important to stress that the savouring effect that is studied here differs from the obvious consumption smoothing whereby agents anticipate, in their current consumption level, the higher income due for tomorrow (e.g. Browning and Collado 2001). The focus of the paper is

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not on the inter-temporal allocation of material consumption, but on the inter-temporal externality of satisfaction,that is, on the "direct effect of information on pleasure and pain" (Loewenstein 2006, p 313).

1.2 Why does it matter?

Should economists bother taking into account inter-temporal transfers of utility? There are many arguments in favour of doing so. One of them is that inter-temporal utility spillovers complicate the understanding of what a rational behaviour should be and constitutes a challenge for the theory of decision-making[5]. Consider for example, the notion of the satisfaction treadmill, which lies at the foundation of the so-called Easterlin paradox. The idea is that habituation effects destroy the benefit of growth. This is because of the deleterious role of aspirations: "*Material aspirations increase commensurately with income, and as a result, one gets no nearer to or farther away from the attainment of one's material goals, and well-being is unchanged*" (Easterlin 2003, p 11180).

The issue is provocative and important for both theoreticians and policy-makers. On the theoretical side, agents who underestimate the habituation effect that sweeps away part of their expected income utility should not be represented as rational utility maximizers, but rather as myopic inter-temporally inconsistent persons. They take decisions based on false expectations so that their experienced utility turns out to be different (lower) from their expected utility[6]. On the political side, the market economies of social democracies are based

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[5] Inter-temporal spillovers seem to question the validity of the consumer model by calling in heterodox assumptions about agents' preferences or behaviour, but the recognition of such behaviour can help to explain a series of puzzling phenomena such as the manipulation of information (strategic learning and remembering). People who derive utility from their beliefs or representations about the future can rightly choose to "put their head in the sand". Hence, they will not take medical tests in order to avoid thinking about the possibility of being ill or will not prepare their retirement in order to keep away from the idea of old age and death. Governments and doctors can also carefully filter the information they give to their patients or citizens in order to maximize their welfare (Caplin and Leahy 2003). More generally, habituation, loss-aversion and anticipatory feelings contribute to explain many anomalies and apparently time-inconsistent behaviour, such as nominal price rigidities, the departure of wages from productivity, or the equity premium puzzle (Camerer and Loewenstein 2004, Frederick et al. 2002).

[6] As put by Easterlin (2001, p 481), "People […] project current aspirations to be the same throughout the life cycle, while income grows. But since aspirations actually grow along with income, experienced happiness is

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on a pro-efficiency-cum-growth consensus. If growth turns out not to make people happy, then other types of social organizations could be preferable. The implications of the Easterlin question thus loom large, questioning the need for paternalism and the choice of capitalism.

The Easterlin paradox is based on adaptation (i.e. the influence of past consumption on current utility). However, taking into account the emotional impact of future prospects can bring about different conclusions and reconcile adaptation with growth. Indeed, with a "taste for improvement", working hard for money or any other goal, even in a framework with adaptation, turns out not to be a self-defeating project.

This short discussion illustrates the complexity of the interlocked dynamics of income, aspirations, expectations and satisfaction. This paper does not try to estimate a structural model of these effects; instead, it tries to estimate a reduced form of the ex post relation between past or expected progress and satisfaction, based on a retrospective view.

1.3 Existing empirical evidence

Thus far, the empirical evidence about inter-temporal spillovers has mainly been collected from field studies or experiments. (e.g. Loewenstein and Sicherman 1991, Loewenstein and Prelec 1991, Loewenstein et al. 2003, Brocas and Carillo 2003 and 2004, Camerer et al. 2004). A famous and intuitive experiment by Loewenstein and Prelec asked people to choose over different sequences of dinners at more or less fancy restaurants; the results revealed a strong preference for improving sequences (in terms of meals' quality). Recently, a new type of evidence has been provided by experiments in neuroscience and more specifically in "neuro-economics" (Camerer et al. 2004). For instance, an experiment by Berns et al. (2006) uses functional magnetic resonance imaging to relate brain activity with anticipations and dread. They observe a significant relationship between individual differences in the measure of dread in the brain activity and individual differences in inter-temporal choice behaviour (Loewenstein 2006).

By contrast, survey evidence is scarce. Concerning adaptation, di Tella et al. (2007) use the German GSOEP panel data and find signs of total habituation to income (but not to status);

systematically different from projected happiness. Consequently, choices turn out to be based on false expectations".

they show that the effect of past income on current satisfaction tends to fade away with time. Stutzer (2004), using a Swiss survey, finds that higher income aspirations reduce individual utility. He uses the "income evaluation question" (*in your circumstances, what income would you find sufficient*?) as a proxy for aspirations. Aspirations of agents are then found to depend on the average income of their community and on their own income, conformingly to van Praag's earlier finding. One of the most remarkable contributions of the Leyden school is indeed the unveiling of a "preference drift", an evaporation of the *ex post* effect on satisfaction of a rise in individual income (see van Praag 1971 and 1991 and van Praag and Ferrer-i-Carbonnell 2004).

Concerning spillover effects from the future, Clark et al. (forthcoming) have shown that individuals start being less happy one year before they experience job quits, layoffs and unemployment. Van Praag and Ferrer-i-Carbonell devote a chapter of their book to "The Impact of Past and Future on Satisfaction", showing that both past remembered and future expected income influence current financial satisfaction. Frank and Hutchens (2004) observe the increasing wage profiles of commercial airline pilots and intercity bus drivers and show that in both cases, earnings grow more rapidly than productivity over time. They interpret this as a sign of a preference for rising consumption profiles, coupled with other behavioural assumptions such as lack of willpower and comparison effects, that make this type of forced saving desirable when individuals are unable to defer present consumption.

The next section presents the data and the empirical strategy. Section 3 presents the results, section 4 interprets them, and section 5 concludes.

2. DATA AND EMPIRICAL STRATEGY

This work is based on the waves 5 to 13 of the *Russian Longitudinal Monitoring Survey* (RLMS), a database containing many attitudinal questions related to satisfaction, expectations and past changes in individuals' living standards. These waves correspond to years 1994, 1995, 1996, 1998, 2000, 2001, 2002, 2003, and 2004. This is panel data, so it is possible to follow the dynamics of expectations and satisfaction of the same individuals during nine consecutive rounds. The panel nature of the data also allows the control of (at least some of the) unobserved individual heterogeneity. Finally, the Russian environment is a guarantee of sufficient variance in the dynamics of income, expectations and satisfaction. Essentially, in Russia, aggregate income and subjective well-being decline from 1994 and resume after the

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devaluation of August 1998 and onwards. Behind these aggregate evolutions, it is well-known that the Russian context imposes a high degree of variability and uncertainty upon Russian households (Senik 2004, Eggers et al. 2004).

The main *demonstrandum* of this paper is the pure effect of progression on welfare: c*eteris paribus*, given their total stock of real expenditure, agents are happier with an increasing time-profile of consumption. One thus needs to identify the welfare effects of past and expected variations in individual consumption. The next sub-section presents the attitudinal questions that are used to proxy these effects.

2.1 Subjective variables as proxies for welfare

Let C_t, C_{t-1}, C^a_t, C^a_{t+1} be respectively the flows of current consumption at time t, past consumption at time t-1, consumption at time t as expected in t-1, and future expected consumption at time t+1 as expected at time t. The RLMS data contains several subjective variables that correspond to these magnitudes.

The EXPECTED IMPROVEMENT subjective variable (*Do you think that in the next 12 months you and your family will live better than today or worse?*) is taken to proxy the difference between current and future expected living standard (C^a_{t+1} - C_t), while the PAST IMPROVEMENT question (*Tell me, please: How has the financial situation of your family changed in the last 12 months?)* proxies subjective past evolution, (C_t-C_{t-1}). The current consumption of the household C_t is proxied using the LOG REAL EXPENDITURE of the year, which is based on a detailed and exhaustive reporting of all consumption items by the household. Concerning the past level of consumption C_{t-1}, one would like to have a variable representing "remembered utility" (in the terminology of Kahneman et al.), for example, a question that would ask "what was your living standard last year?" However, as there is no such variable in the dataset, I use LAGGED REAL EXPENDITURE as a proxy for C_{t-1}.

Eventually, the objective is to assess the effects of these variables on general LIFE SATISFACTION (*To what extent are you satisfied with your life in general at the present time?*). I also use self-assessed HEALTH *(Tell me, please: How would you evaluate your health?)* as a proxy for experienced utility. The descriptive statistics of the variables are presented in the Appendix.

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2.2 Empirical strategy

The objective is to isolate the pure welfare effect of expectations[7] and change *per se* (i.e. the relation between LIFE SATISFACTION and indicators of progress such as EXPECTED IMPROVEMENT or SITUATION HAS IMPROVED, *ceteris paribus*). To this end, one must overcome the difficulty that stems from the intertwined effects of aspirations, adaptation and expectations. Suppose for instance that my current positive expectations make me happier today but create higher aspirations that render it more difficult to satisfy me tomorrow. Then, what is the total dynamic effect of positive expectations on inter-temporal happiness?

In order to elucidate this question, an intuitive way is to take a retrospective view. The idea is to capture the net result of these complex dynamics of expectations, progress and satisfaction by asking the following question: "after several years, for a given stock of inter-temporal consumption, do people who have more often experienced or expected a progression in their living standard have a higher score of cumulated happiness than (otherwise identical) people who have consumed the same stock but without expected or actual progression?" Hence, one needs to estimate a relationship between an aggregate indicator of progression and an aggregate score of Life Satisfaction, controlling for the total stock of real consumption of the individual over the considered period.

A technical question is what period to consider (i.e. how to aggregate the time series). It is tempting to "collapse" the whole period 1994-2004 in order to have more hindsight. However, this would not allow controlling for individual unobserved heterogeneity. An obvious problem is indeed that happiness and expectations are probably endogenous to some idiosyncratic invariant personal feature such as "personality". Subjective variables are particularly subject to anchoring effects that make interpersonal comparisons difficult. For

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[7] A delicate issue is whether my experienced utility in t is affected by my expected experienced utility in t+1 or by the expected change in my standard of living. In other words, what are anticipatory feelings about: the future event itself or the future contentment brought by the event? The future flow of utility or its argument? Although the question is interesting, there is no means to decide upon it, at least with the material on which this paper is based. Indeed, the question "*Do you think that in the next 12 months you and your family will live better than today or worse?*" mixes the impact of expectations with their content. On the other hand, false beliefs *à la Easterlin* concern flows of utility, not of consumption (i.e. people imagine that getting richer will make them happy, but it does not).

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example, more extraverted persons may be systematically more satisfied and more optimistic than others, hence the "spurious" relation between the two variables. Supposing that personality is time invariant and that it can be approximated by an additive effect, the usual method is to introduce fixed effects[8].

In order to keep the time dimension of the data so as to introduce individual fixed effects, I thus divide the observations into three blocks of three years[9]. I then aggregate the stock of consumption and the score of Life Satisfaction inside each block. The equation to estimate is (1):

CUMULATED LIFE SATISFACTION $_{ib}$ = a_0 + a_1. CUMULATED CONSUMPTION$_{ib}$ + a_2. INDICATOR OF PROGRESS $_{ib}$ + a_3 .X_{it} + a_4. I_t + u_{it} + e_i (1)

where b=1 for years 1994-1996, b=2 for years 1997-2000, and b=3 for years 2001-2004, CUMULATED LIFE SATISFACTION$_{ib}$ is the sum of life satisfaction scores of individual i over the years of block b, CUMULATED CONSUMPTION$_{ib}$ is the sum of consumption flows of individual i over block b, e_i is a time invariant individual fixed effects, X_{it} is a vector of socio-demographic controls, I_t are time dummies, and u_{it} is a white noise. These three sets of variables are measured at the last year of each time block, so that t =1996 if b=1, t = 2001 if b = 2 and t = 2004 if b = 3.

The estimation of equation (1) is thus run on a sample of 2808 individuals * 3 years (i.e. 8424 observations).

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[8] Subjective variables are ordinal variables; hence, in principle, they are improper to simple differences. Two solutions are then available: (i) either collapse the satisfaction and expectations variables into categories (satisfied/not satisfied, situation will improve/deteriorate) and run a conditional fixed effect logit model, which imposes an important loss of information; (ii) or ignore the ordinal nature of the variables and use classic panel models. Surprisingly, after a series of papers that cautiously respected the ordinal nature of subjective variables, economists started to go back to linear models, considering after Ferrer-i-Carbonnel and Frijters (2004) that introducing fixed effects was of primary importance. In this paper, I adopt the second approach, but I check that the results are robust to the first one.

[9] I have done the same exercise collapsing the time dimension into two periods of five years; the results are identical.

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In terms of INDICATOR OF PROGRESS, I consider alternatively four indicators. They measure respectively the number of times inside each time block that an individual declares expecting an improvement, expecting a stable situation or expecting a deterioration in the material situation of her family. I also measure an objective indicator of progression (i.e. the number of times the real household income of an individual has increased during the period). All these indicators can take discrete values from 0 to 3.

This specification does not solve all the problems. Another important caveat is that happiness and financial expectations can be endogenous to some unobserved variable (omitted variable problem). A solution is then to instrument expectations. In addition, there is the suspicion that happiness influences expectations rather than the opposite (reverse causation problem). People who are unhappy at a certain point of their lives could well have a bias towards pessimistic expectations of income for instance. On the contrary, people who are satisfied or going though a good period of their lives could well be more optimistic. Instrumentation also solves part of this problem. On the other hand, as long as the causality does run from expectations to happiness, one should not mind the existence of a reverse causality too. The objective is not to exclude that happiness causes optimistic expectations, but only to assess whether the reverse is true.

As it is difficult to instrument the aggregate score of expected progress, I use a different specification: I regress current Life Satisfaction over instrumented current expectations, controlling for socio-demographic variables, time dummies and individual fixed effects.

As an additional robustness test, in order to be sure of dealing with *ex post* experienced utility instead of *ex ante* decision utility (in which case the results would be trivial), I alternatively use self-assessed HEALTH *(Tell me, please: How would you evaluate your health?)* instead of LIFE SATISFACTION as the endogenous variable of the above regressions.

3. RESULTS

The empirical analysis shows that the time profile of consumption seems to have a welfare impact *per se*. Instrumenting expectations and questioning the notion of life satisfaction do not alter this result.

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3.1 The importance of progressing

I start with the estimation of equation (1), which tries to answer the following questions: with hindsight, for a given stock of total cumulated consumption over three consecutive periods, how does the fact of having nourished positive (resp. negative) expectations feed into cumulated happiness, and how does the fact of having experienced a rising income profile affect cumulated happiness? This exercise thus tries to capture the welfare effect of the perceived and objective time profile of individuals' living standard.

Table 1 displays the estimation of equation (1), specifically the regressions of CUMULATED LIFE SATISFACTION scores of the periods 1994-1996, 1998-2001 and 2002-2004 over CUMULATED EXPENDITURE in the same periods, an INDICATOR OF CUMULATED PROGRESSION in one's living standard during the same periods, and other controls measured at the last year of each block (1996, 2001, 2004).

Not surprisingly, total CUMULATED REAL HOUSEHOLD EXPENDITURE exerts an important impact on CUMULATED LIFE SATISFACTION. Then, controlling for this variable, column 1 shows the positive welfare impact of the number of periods that individuals objectively experienced an increase in their real household income (symmetrically, aggregate happiness decreases with the number of periods of declining living standard). Table A1 in the Appendix confirms this result using individuals' subjective past evolution. It shows that, ceteris paribus, the more often people have felt that their financial situation had improved (resp. deteriorated), the higher (resp. lower) their cumulated ex post satisfaction. Subjective past stability has a much lower impact on cumulated satisfaction compared to past improvement or deterioration.

Turning to subjective expectations, Table 1 suggests that the more often individuals have nourished positive expectations, the higher their total cumulated happiness score (column 2). One additional period of positive expectations increases cumulated happiness by 0.546, knowing that the cumulated happiness score over three years varies from 0 to 15 with an average of 6.9 and a standard deviation of 0.76. Expecting a stable living standard (column 3) is also a factor of cumulated happiness but by a much lower extent. Conversely, the more often individuals have expected a deterioration in their living standard, the lower their

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cumulated happiness score (column 4). However, expecting an improvement exerts an impact of a larger absolute magnitude than expecting stability or a deterioration[10].

Hence, controlling for the total stock of real consumption over three years, there seems to be a positive relation between income mobility, both past and expected, and individual total happiness. In other words, for a given amount of consumption over time, the time-profile matters: individuals have a preference for increasing sequences of consumption.

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[10] Of course, one cannot compare the effect sizes as if they were based on equal quantitative changes of material circumstances. First, the variables are qualitative; they capture the feeling of respondents that things have "improved" or "worsened", but not the extent to which they have. Moreover, in Tables 1 and 3, the variables are defined as the number of times an individual experiences or expects a progression/ deterioration/stability of his material living standard. Hence, the important point is the asymmetry between negative and positive change. This could be misleading if negative shocks were of a much larger magnitude than positive shocks. However, there is no reason to believe so. In particular, since 1998, the Russian economy has been on a strong growth trend, so incomes have been on the rise (in average).

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Table 1. Happiness and Consumption Dynamics

Fixed Effects OLS of CUMULATED LIFE SATISFACTION

	-1	-2	-3	-4
NB PERIODS WITH HOUSEHOLD INCOME RISE	0,089***			
	[0.034]			
NB PERIODS WITH EXPECTATIONS OF IMPROVEMENT		0.546***		
		[0.041]		
NB PERIODS WITH EXPECTATIONS OF STABILITY			0.106***	
			[0.028]	
NB PERIODS WITH EXPECTATIONS OF DETERIORATION				-0.385***
				[0.033]
LOG TOTAL EXPENDITURE	0,168***	0.152***	0.168***	0.151***
	[0.019]	[0.019]	[0.019]	[0.019]
Observations	8284	8214	8214	8214
Number of persons	2808	2808	2808	2808
R-squared overall	0,229	0,254	0,232	0,249
Log likelihood	-14844	-14532	-14653	-14561

Controls: age, age square, number of children, working status, marital status, time dummies.
* significant at 10%, ** significant at 5%, *** significant at 1%.
Regression of cumulated LIFE SATISFACTION SCORES of the periods 1994-1996, 1998-2001 and 2002-2004 over CUMULATED EXPENDITURE and CUMULATED INDICATORS OF IMPROVEMENT in the same periods and other controls taken at the last year of each block (1996, 2001, 2004).

Before addressing the problem of omitted variables using instrumentation (in section 3.3), I have tried to rule out a possible (sceptical) interpretation of Table 1, namely that some unobserved variable (beyond personality traits) that is shared across optimistic, happy and reportedly healthy people is driving the findings. It is true that Happiness, Expectations and Health are correlated[11]. I thus try to verify that that the relation between progression (actual and expected) and life satisfaction is robust to the situation, trajectory or features of individuals.

The main suspicion is that people tend to extrapolate the trends that they have experienced in the past. This implies that people who have experienced a past improvement tend to have positive expectations and be happier, whereas those who have experience negative outcomes

[11] The correlation table is the following:

	Happy	Health	Expectations
Happy	1.0000		
Health	0.1970	1.0000	
Expectations	0.3671	0.2031	1.0000

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in the past tend to expect that the same evolution will happen in the future. If so, Table 1 is not illustrating the effect of expected change on happiness but simply the effect of past experience. In order to explore this issue, Table 2 presents the regression of current LIFE SATISFACTION over current EXPECTED IMPROVEMENT, controlling for real expenditure and the usual controls, over three different samples of individuals: the whole sample (column 1), the sub-sample of individuals who estimate that their situation has improved as compared to 12 months ago (column 2), and the sub-sample of people who think that their situation has worsened or remained unchanged (column 3). Table 2 shows that the effect of EXPECTED IMPROVEMENT remains positive and significant whatever the past evolution of the agent. Hence, the effect of EXPECTED IMPROVEMENT on LIFE SATISFACTION does not just reflect the past experience of individuals.

Table 2. The impact of expectations does not depend on past evolution

Fixed Effects OLS Regressions OF LIFE SATISFACTION

	-1	-2	-3
	All	**Situation improved**	**Situation did not improve**
EXPECTED IMPROVEMENT	0.343***	0.162**	0.200***
	[0.021]	[0.080]	[0.047]
LOG REAL EXPENDITURE	0.128***	0,019	0.084***
	[0.012]	[0.060]	[0.027]
Observations	17018	1771	5489
Number of persons	2551	1084	2114
R-squared	0,128	0,071	0,037
Log likelihood	-19917	-1228	-5261

Controls: age, age square, nb children under 7 in household, nb children from 7 to 18 years old in household, working status, marital status, year dummies.
Dichotomized variable: expect improvement: yes or no.
The number of observations is smaller in columns 2 and 3 because variable past improvement is only available during four waves, from 2001 to 2004.
* significant at 10%, ** significant at 5%, *** significant at 1%.

I have also checked that the relation between progress and life satisfaction holds for other partitions of the sample (e.g. richer versus poorer). Hence, the relation is not driven only by the individuals who experience positive (or negative) affects in the three dimensions (health, happiness and expectations).

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3.2 Health and expected improvement

Another worrying question is the following: does the variable LIFE SATISFACTION really measures *ex post* experienced utility and not *ex ante* expected utility? In the latter case, there would be nothing surprising about the fact that expected improvement raises expected future utility. By contrast, if declared LIFE SATISFACTION reflects (at least partly) experienced happiness, then the observation that this variable is influenced by expectations is not trivial. In other words, the question is whether declared LIFE SATISFACTION measures a feeling rather than a value judgement.

How can one separate decision-utility from experienced-utility? Consider the definition of health in the Constitution of the World Health Organization in 1946: "*Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*"; this description is almost indistinguishable from the definition of well-being (i.e. experienced utility). *De facto*, self-assessed health is highly correlated with declared satisfaction ($R2=0.19$). Since most specialists would agree that health is certainly an experience rather than a judgement, it is thus interesting to use the SELF-ASSESSED HEALTH variable, which is available in the RLMS survey, as a proxy for the feeling of satisfaction[12] and to check whether it depends on past and expected progress.

I thus estimate an equation similar to (1), in which I replace LIFE SATISFACTION with SELF-ASSESSED HEALTH.

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[12] The important point here is not that subjective health be unbiased but that it reflects an experience, a feeling, rather than an abstract judgement.

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Table 3. Health and consumption dynamics

Fixed effects OLS regressions of CUMULATED SELF-DECLARED HEALTH

	-1	-2	-3	-4
NB PERIODS WITH HOUSEHOLD INCOME RISE	0,016			
	[0.019]			
NB PERIODS WITH EXPECTATIONS OF IMPROVEMENT		0.095***		
		[0.024]		
NB PERIODS WITH EXPECTATIONS OF STABILITY			0,024	
			[0.016]	
NB PERIODS WITH EXPECTATIONS OF DETERIORATION				-0.101***
				[0.019]
LOG TOTAL EXPENDITURE	0,005	0,002	0,005	0
	[0.011]	[0.011]	[0.011]	[0.011]
Observations	8214	8214	8214	8214
Number of persons	2808	2808	2808	2808
R-squared within	0,044	0,047	0,044	0,049
log likelihood	-10148	-10137	-10147	-10128

Controls: age, age square, number of children, working status, marital status, time dummies.
Regression of CUMULATED HEATH SCORES of the periods 1994-1996, 1998-2001 and 2002-2004 over CUMULATED EXPENDITURE and CUMULATED INDICATORS OF IMPROVEMENT in the same periods and other controls taken at the last year of each block (1996, 2001, 2004).
* significant at 10%, ** significant at 5%, *** significant at 1%.

As shown by Table 3, SELF-ASSESSED HEALTH[13] is sensitive to one's expected consumption trajectory. Positive and negative expectations have an impact of similar magnitude (columns 2 and 4 in Table 3) although negative prospects have a slightly more important impact. This contrasts with the regression of LIFE SATISFACTION, where the number of periods with EXPECTATIONS OF IMPROVEMENT had a larger impact than the number of periods with EXPECTATIONS OF DETERIORATION. Table A2 in the Appendix shows that, ceteris paribus, people who have more often experienced an improvement (resp. a deterioration) in their financial situation also reach ex post higher (resp. lower) scores of cumulated subjective health.

Hence, SELF-ASSESSED HEALTH can be considered as a proxy of LIFE SATISFACTION but seems to have its own profile. In particular, the stress generated by negative anticipatory feelings

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[13] It may come as a surprise that the coefficients on total expenditure and objective income rise are not significant, but this is a classical result that income is not a significant variable in the regression of subjective health.

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seems to be particularly harmful for subjective health. Stability has a much lower impact on subjective health than it has on subjective life satisfaction. Beyond these particular feature of self-assessed health, the lesson of Tables 1 and 3 is that expected and observed progression can be considered to influence experienced-utility and not only decision-utility.

3.3 Ruling out the "omitted variable" interpretation

When assessing the welfare effect of expected and perceived improvement, how can one be sure not to evaluate the impact of a hidden variable? In this section I concentrate on the influence of expectations.

The classical response to the omitted variable problem is instrumentation: one needs to think of a variable that influences EXPECTATIONS directly, but only influences LIFE SATISFACTION through EXPECTATIONS. Stutzer (2004) uses aggregate income variables and contact with neighbours as instruments for aspirations. In a similar spirit, I use the typical income of one's professional group at the next period to instrument EXPECTATIONS. I thus regress real income (y_{t+1}) on age, gender, industry, diploma, occupation and regional price level in period ($t+1$). I then use the PREDICTED INCOME of the next period ($\hat{y}_{t+1}$) as an instrument, which is what agents should expect if they had perfect foresight. (I check that indeed agents have quite reasonable forecasts about the evolution of their living standard; see section 4.2). Lastly, I verify that instrumented expectations do influence self-declared happiness.

The system of equations to estimate is thus the following:

- PREDICTED INCOME:　　　　$y_t = b_0 + b_1.$(age, gender, education, occupation, region,

$$\text{industry})_t + \varepsilon_{it} \tag{2.1}$$

- EXPECTED IMPROVEMENT :　$E_{it} = e_0 + e_1. \hat{y}_{i\,t+1} + v_{it} + \omega_i \tag{2.2}$

- LIFE SATISFACTION:　　　　$LS_{it} = d_0 + d_1.C_{it} + d_2.\hat{E}_{it} + d_3.X_{it} + d_4.I_t + \upsilon_{it} + \nu_i \tag{2.3}$

where ε_{it}, v_{it} and υ_{it} are white noises, and ω_i and ν_i are individual fixed effects.

Beyond the usual assumptions about the error terms, this system is based on the assumption that PREDICTED FUTURE INCOME $\hat{y}_{i\,t+1}$ does not influence LIFE SATISFACTION at period t directly but only via EXPECTATIONS, which means that the right-hand side variables that are used to estimate $\hat{y}_{it+1}$ should also not influence LIFE SATISFACTION directly but only via

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EXPECTATIONS, except those who are also present in the final regression of LIFE SATISFACTION (i.e. age and gender). This is all the more credible as these magnitudes are measured one period ahead (t+1) from current life satisfaction (t) [14]. One also has to avoid the risk of perfect multi-collinearity between the right-hand side variables in the estimation of $\hat{y}_{it+1}$ and the right-hand side variables of the regression of Life Satisfaction, in particular, the socio-demographic variables that are designated under the term X_{it}. As shown in Table 4, X_{it} includes age, age square, the number of children under 7 years old and between 7 and 18 years old, the working status and the marital status of the individuals. This exclusion relation should ensure that this risk is avoided.

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[14] A possible limitation of the instrument is the high volatility of the Russian economy. In addition, the relation between skills and rewards has been greatly perturbated since the beginning of the Transition. However, this does not mean that most individuals cannot forecast their future situation, even though it does not correspond to what they could aspire to in another context or in the pre-Transition context.

Another (opposite) problem is that predicted income (i.e. the instrumental variable) might capture the higher job security somebody is experiencing in t, even though the predicted future income is based on the typical income of the individual based on his circumstances as of t+1. I have checked that restricting the sample to individuals who change job at the next period (5346 observations) does not alter the result (the coefficient on predicted future income is 0.13 (0.035) and the coefficient on instrumented expectations is 1.13 (0.37). The idea is that if the individual changes job, her expectations are regressed on the new characteristics of the job in t+1 and not on her job in t. Nonetheless, it is still possible that the reason why an individual expects to change job at time t+1 is likely to make her happy already in the current period t. An ideal instrument would capture something exclusively related to the future and not to the current circumstances of the individual…

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Table 4. Two Stage Least Square Regression of LIFE SATISFACTION EXPECTATIONS Instrumented by PREDICTED INCOME for the Next Period

Second stage regression of LIFE SATISFACTION

	Coef.	Std. Err.	t
EXPECTED IMPROVEMENT	**0,81**	**0,20**	**4,04**
Log real expenditure	0,09	0,04	2,25
Age	-0,01	0,01	-1,5
Age square	0,00	0,00	2,76
Nb child<7	-0,05	0,02	-2,93
Nb child 7<n<18	-0,04	0,01	-2,85
Working	0,18	0,03	5,58
Never married	-0,03	0,04	-0,85
Divorced	-0,10	0,04	-2,56
Widow	-0,12	0,04	-3,34
_cons	-0,57	0,47	-1,23
Number of obs	18290		
Nb clusters	2801		
F(10, 2800)	96,98		
Prob > F	0,00		
R-squared	0,04		
Root MSE	1,05		

First-stage regression of EXPECTED IMPROVEMENT

	Coef.	Std. Err.	t
PREDICTED FUTURE INCOME	**0,12**	**0,02**	**6,25**
Log real expenditure	0,20	0,01	24,15
Age	-0,04	0,00	-14,7
Age square	0,00	0,00	11,64
Nb child<7	0,02	0,01	1,65
Nb child 7<n<18	-0,05	0,01	-5,33
Working	-0,12	0,02	-7,02
Never married	0,00	0,03	0,05
Divorced	0,00	0,03	-0,09
Widow	0,03	0,02	1,34
_cons	1,22	0,18	6,79
Number of obs	18290		
nb clusters	2801		
F(10, 18279)	156,76		
Prob > F	0,00		
R-squared	0,08		
Adj R-squared	0,08		
Root MSE	0,94		

Regression with robust errors, cluster (individual). Instrumented: Expected improvement. In the first-stage regression, Expected improvement in period t is regressed on individual circumstances at period (t+1).

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The results of Table 4 show that the predicted income of the next period does influence current expectations and that instrumented expectations, in turn, do influence Life Satisfaction. Hence, one cannot reject the assumption that the relation between EXPECTED IMPROVEMENT and LIFE SATISFACTION is not spurious.

The same doubt can be cast on SUBJECTIVE HEALTH: do optimistic persons feel more healthy or is there some unobserved reason why they feel both more optimistic and more healthy? Likewise for the regression of LIFE SATISFACTION, I try to establish the direction of the causality by instrumenting EXPECTED IMPROVEMENT on future PREDICTED INCOME, assuming that PREDICTED INCOME only influences SUBJECTIVE HEALTH via expectations. The result of the 2SLS estimation confirms that there is some causality going from expectations to health: in the first stage estimation of EXPECTED IMPROVEMENT, the coefficient of PREDICTED INCOME is 0,032, with a T statistics of 4; in the second stage estimation of HEALTH, the coefficient of instrumented EXPECTED IMPROVEMENT is 0,949, with a T statistics of 2,4 (controlling for the usual variables). Hence experienced utility, as proxied by SELF-DECLARED HEALTH, seems to be influenced by expectations.

4. INTERPRETATION. PROGRESSION AND SISYPHUS

This set of results suggests the following conclusions: Remembered and expected events exert an important impact on current experienced utility. They influence Life Satisfaction as well as self-assessed Health. Declared Life Satisfaction thus expresses moment-utility, which according to Kahneman (2003) is best suited for constructing a measure of objective happiness.

4.1 Sisyphus

Ceteris paribus, people are happier when they observe or expect a positive change. As put by Camerer and Loewenstein (2004, p 26) "*A majority of subjects prefer sequences that improve over time. Preferences for improvement appear to be driven in part by savouring and dread, and in part by adaptation and loss-aversion*" because "*improving sequences allow decision makers to savour the best outcomes under the end of the sequence. With losses, getting undesirable outcomes over with quickly eliminates dread. Adaptation leads to a preference for improving sequences because people tend to adapt to ongoing stimuli over time and to*

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evaluate new stimuli relative to their adaptation level [...]. Loss aversion intensifies the preference for improvement over deterioration ".

This preference for improvement in the context of adaptation is a reminder of the legend of Sisyphus. As a punishment inflicted by Zeus, Sisyphus was doomed to push a boulder uphill over and over again, knowing that as soon as the rock would reach the top it would immediately fall back. In a similar way, man seems to be doomed to progress: progressing does not always make him much happier but not doing so would condemn him to an even more cruel fate. Transposed in the field of economics, the idea is that lucid agents rationally enjoy the perspective of a progression in their material situation, be it only because this is the only means to overcome the deleterious work of adaptation.

4.2 Happiness out of illusion?

Another interpretation of the taste for progression could be that agents underestimate adaptation and overestimate their future welfare[15], as suggested by Easterlin (2001). Partisans of economic growth could reply that even so, people who strive for money, although they may find out that the increase in their material standard is not as satisfying as expected, may nonetheless have enjoyed the perspective. However, this raises a series of issues. First, how much value can we attach to growth if its welfare effect is due to agents' misprediction of their future utility? More importantly, when agents acknowledge that their expectations were too high, how much disutility does this generate? To what extent does the *ex post* disutility of disappointment compensate the flow of anticipatory feelings that was felt *ex ante*? Conversely, is there a possibility of a double dividend, one from the imagination and one from the realization of the event?

Some answers to these questions are provided by Table 1, which suggests that in spite of adaptation and possible forecasting errors, the net inter-temporal effect of having positive expectations is to increase cumulated happiness. Moreover, the data shows that agents make quite reasonable predictions about their future standard of living. In the fixed effect OLS

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[15] The literature is rich of examples of mistaken forecasts of future welfare. Loewenstein (1987) for instance, reports the experience of people whose degree of anxiety about a future surgery operation turns out to be much more intense that the pain they actually suffer during the operation.

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regression of PAST IMPROVEMENT at period t *(How has the financial situation of your family changed in the last 12 months?)*, the coefficient of EXPECTED IMPROVEMENT at period t-1 (*Do you think that in the next 12 months you and your family will live better than today or worse?*) is positive, important and significant at the 1% level. Hence, the data do not validate the assumption that agents are not lucid about their future prospects, and more precisely that they fail to predict the way they will appreciate their consumption level in the future.

Finally, the data do not validate the assumption of complete adaptation. To test the extent of adaptation to income, I use the same method as Di Tella et al. (2007), namely I introduce HOUSEHOLD EXPENDITURE at time t, t-1, t-2 and t-3, in the regression of LIFE SATISFACTION, controlling for the usual socio-demographic variables. I do not find evidence of a strong adaptation effect. The coefficients on the lagged variables are not significant. Hence, the data do not support the assumption of a strong, and a fortiori complete, adaptation.

In summary, expectations are not completely misled; they are consistent with agents' *ex post* evaluation of their situation, which in turn influences Life Satisfaction. One can conclude that agents are not completely mistaken when they rejoice at the prospect of a future improvement in their living standard. Their anticipatory feelings are not totally compensated by an *ex post* dissatisfaction.

4.3 A built-in disposition?

Camerer and Loewenstein go as far as claiming that "*people have a "gestalt" notion of an ideal distribution of outcomes in time*", which means that trying to progress is something like a built-in mechanism, a basic instinct. This observation finds an echo in the psychological corpus, in particular the so-called tellic theories.

First, having aspirations as such is recognized as being good for one's happiness. "*Dispositional optimism*" for instance (i.e. "*one's characteristic thoughts about the future*") is considered by many psychologists as a correlate of happiness (Diener et al., 1999). Cantor and Sanderson (quoted by Diener et al, p 284) note that "*having goals provides a sense of personal agency and a sense of structure and meaning to daily life*". Emmons (1986, quoted by Diener et al, p 285) reports that "*positive affect and a higher life satisfaction are associated with past fulfilment of goals and with having valued goals, independent of past success*". Pomerantz et al. (quoted by Diener and Lucas 2000, p 60) also claim that "*people with more goals that they consider very important have higher life satisfaction, self-esteem*

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and positive affect". As a *contraposée*, not trying to progress, not having aspirations is often considered by psychologists as a sign of depression or illness.

Second, the mere fact of moving towards one's goals is also recognized as a source of well-being. Michalos (1985) notes that "*the process of moving towards one's aspirations may be more important to well-being than the end-state of goal attainment. Thus people with high aspirations and low current outcomes may be satisfied as long as they are making adequate progress towards their goal*". According to Emmons (1986, quoted by Diener and Lucas, 2000, p 57) "*happiness results more from the pursuit of a goal than from the attainment of a goal*".

Some authors attribute these observations to anthropologic considerations. They see the attempt to progress as a built-in mechanism specific to humanity. Frank and Hutchens (2004, p 555) for instance, note that the biological model of human nervous system creates the condition of sensitivity to change and deviation rather than to level. It is also tempting to look at the improvement instinct as a feature selected by evolution[16].

Last, a philosophical interpretation is a more optimistic version of Sisyphus: Descartes thought that self-esteem is the basis of happiness. Therefore, progressing, while as painstaking as pushing Sisyphus' boulder, would make man happy by generating self-esteem or the pleasure that derives from contemplating a valuable goal.

5. CONCLUSION: BACK TO THE EASTERLIN PARADOX

This paper has illustrated the existence of anticipatory feelings and the preference for improving sequences of consumption. Raising the incomes of all may not increase the happiness of all, but expecting a financial improvement seems to be a motive of well-being *per se*, beyond the obvious effect of consumption smoothing.

To be sure, this pro-growth argument may not be decisive; in particular it does not take into account the negative externalities of growth. Similar effects could also probably be evidenced

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[16] Of course, it could be argued that evolutionism is based on competition and that it is competition that forces individuals to progress, in spite of their preference for leisure, but then the question of why people engage into competition has to be addressed.

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in other domains, and it would be interesting to compare the relative impact of material improvement versus progress in other fields.

However, unveiling the role of expectations sheds light on the Easterlin paradox. There seem to be several channels relating income growth with well-being. The first most obvious one is of course the direct positive effect of consumption. The second and third negative channels are social comparisons and adaptation. Last, the fourth channel is the positive impact of expectations.

The net effect of these four channels may turn out to be deceptively small if these effects more or less compensate each other. This would explain the Easterlin paradox. Hence, before concluding that income growth does not make people happy, it is worth decomposing the general relation between GDP growth and Life Satisfaction, especially if the relative effect of these channels depends on the macroeconomic and institutional features of the economy.

An assumption to explore is indeed that the positive welfare impact of expectations is higher in certain contexts. Senik (2004 and 2007) showed that expected income based on the observation of one's professional peers has a particularly strong welfare impact in more mobile and uncertain economies (e.g. Transition countries). The current paper extends this result to expected income in general. It recalls that growth is one of the important ingredients of national welfare.

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