THE (UN)HAPPINESS OF KNOWLEDGE AND THE KNOWLEDGE OF (UN)HAPPINESS: Happiness research and policies for knowledge-based economies

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[DRAFT, COMMENTS WELCOME]

ABSTRACT

This paper explores the current state and interfaces of two broad policy discourses, i.e. that of policies for knowledge-based economies (KBEs) and policy implications of happiness research, which so far have exhibited little explicit cross-referencing. I first review the state of 'mainstream' knowledge policy associated with the OECD, the related but somewhat separate literature on information society indicators, and some 'non-mainstream' knowledge policy analysis. This is followed by a brief overview of some of the major policy implications and controversies in happiness research. Next, I discuss major interfaces of the two policy discourses. They mostly concern the nexus of education, work and innovation. I also illustrate the diversity of beliefs and values about some core elements of KBEs in a group of what are usually regarded as similar countries, and advocate the use of subjective variables to capture these differences. The main argument put forward in this paper is that policies for KBEs should be informed by insights from happiness research.

Keywords: knowledge-based economies; knowledge policy; happiness research; subjective well-being, productivity.

1. Introduction

This paper is motivated by two observations. First, much of the mainstream discussion of knowledge-based economies (KBEs) seems narrowly technocratic and science & technology (S&T) focussed, promoting a best practice model. Definitions of the KBE vary among authors, and sometimes by the same author over time, but common themes emerge. Some prominent definitions are[1]:

> *"…'knowledge-based economies' - economies which are directly based on the production, distribution and use of knowledge and information. This is reflected in the trend in OECD economies towards growth in high-technology investments, high-technology industries, more highly-skilled labour and associated productivity gains." (OECD, 1996, p. 229)*

> *"…economies in which the proportion of knowledge-intensive jobs is high, the economic weight of information sectors is a determining factor, and the share of intangible capital is greater than that of tangible capital in the overall stock of real capital. These developments are reflected in an ever-increasing proliferation of jobs in the production, processing, and transfer of knowledge and information."*
>
> *(Foray, 2004, p. ix)*

> *"The knowledge economy … is a recent term that signifies a change from the economy of earlier periods. The knowledge economy is an economy in which much greater strategic importance is given to the allocation of resources in*
> - *R&D and other formal modes of knowledge creation,*
> - *The formation of human capital through education and training,*
> - *The management of information, knowledge, and expertise through investments in codification and the building of social networks, and*
> - *The organization of markets of rights in knowledge.*
>
> *This is also an economy in which a general-purpose technology (information technology) provides a powerful infrastructure that increases productivity and offers new opportunities to any knowledge-driven activity." (Foray, 2006, p. 9)*

The mainstream KBE discourse is dominated by a market-driven approach. Knowledge is usually only seen as valuable when transferred (directly or indirectly) to the market and earning a return on investment, i.e. when it can contribute to economic growth. Also, knowledge is seen as the major factor of production the efficient use of which is crucial for productivity growth. The latter is intimately related to changes in the nature of work and work organisation.

The second observation motivating this paper is the lack of explicit cross-referencing between the literatures on KBEs and happiness research in economics. For example, Layard's (2005) popular book on happiness does not mention KBEs in its index, and Foray's (2004) book that tries to define the economics of knowledge as an original

[1] For a critical survey of the plethora of definitions of the KBE and related concepts see Carlaw et al. (2006).

subdiscipline of economics does not mention happiness or subjective well-being (SWB) in its index. This example seems symptomatic of much of the two literatures.

By happiness I mean the degree to which people feel good, or overall subjective well-being (SWB). As pointed out by Frey and Stutzer (2002, p. 403, note 2)

> *"subjective well-being is the scientific term in psychology for an individual's evaluation or her experienced positive and negative affect, happiness, or satisfaction with life. They are separable constructs,…"*

Or more elaborately:

> *"Subjective well-being refers to all of the various types of evaluations, both positive and negative, that people make of their lives. In includes reflective cognitive evaluations, such as life satisfaction and work satisfaction, interest and engagement, and affective reactions to life events, such as joy and sadness. Thus, subjective well-being is an umbrella term for the different valuations people make regarding their lives, the events happening to them, their bodies and minds, and the circumstances in which they live." (Diener, 2006, p. 399/400)*

However, I use happiness and SWB as synonymous in most of this paper. I extend the discussion to additional aspects of SWB only in Section 5 in order to highlight the need for including subjective evaluations of specific core elements of KBEs in policy formulation.

In recent years the mainstream view on policies for KBEs, or 'knowledge policy', seems to have been shifting closer to acknowledging the potential importance of happiness research, without saying so explicitly. Similarly, happiness research is concerned with many features of KBEs, but in almost all cases without explicitly acknowledging the knowledge policy discourse. The main argument put forward in this paper is that currently the knowledge policy and happiness policy discourses are not as closely related as they should be. Producing a closer alignment between them should be a high priority. This can be seen to give the knowledge policy discourse direction: Knowledge is not accumulated for its own sake, but for a purpose, and that purpose is increased human happiness/SWB. Being clear about the ultimate aim of KBEs should lead to more appropriate policies.

I focus only on public policies for developed countries. This does not mean that the topic is irrelevant for poor countries. However, the knowledge policy discourse has been mostly driven by the OECD, and happiness research is mostly focussed on rich countries. Also, there are important differences between poor and rich countries in terms of the relationship between economic growth and happiness which warrant separate discussion.

The paper is organised as follows. Section 2 reviews the current state of knowledge policy associated with the OECD and that of related policy discourses, i.e. the somewhat separate literature on information society indicators, and non-mainstream knowledge policy analysis. Section 3 provides a brief introduction to happiness research and some of its major policy implications and controversies. Section 4

contains a somewhat eclectic review of the more obvious and explicit interfaces of knowledge policy and happiness policy discourses, focussing on the nexus of education, work and innovation. Section 5 illustrates the diversity of beliefs and values about core KBE elements even in a group of similar countries and advocates the use of SWB variables that capture these differences in knowledge policy formulation. Section 6 contains some concluding comments.

2. Comments on the current state of KBE and related policy discourses

The sorry state of the mainstream knowledge policy discourse: Some recent examples

The OECD is mostly responsible for promoting the KBE discourse, making the development of KBEs its major policy focus. It started publishing reports on the emerging KBEs in the mid 1990s, and governments took up the KBE concept in formulating policies shortly thereafter. A key publication is OECD (1996). The string of reports on KBE issues quickly became a torrent, as a check of OECD publications shows.[2] Some recent, and quite revealing, offerings on the topic by researchers closely associated with the OECD are collected in Kahin and Foray (2006). After presenting what seems to be pretty much the 'traditional' mainstream policy consensus, I briefly discuss several contributions to the volume that testify to what seems to be the sorry state of current knowledge policy. They go at least part (but not all) of the way towards acknowledging the potential importance of happiness research in improving this unfortunate situation.

Ásgeirsdóttir (2006) displays little doubt about the current state of knowledge policy. She highlights four key policy messages which she thinks need to be taken into account if the aim is to promote KBEs in order to create economic growth. The first is the importance of more general policies aimed at getting the 'economic fundamentals' right, like stable macroeconomic policies, policies supporting well-functioning markets, efficient training policies, competition policies which ensure low costs of technologies, liberalising telecoms, policies ensuring openness to trade and FDI etc. The second key message is that the development of KBEs depends on the four pillars of innovation, new technologies, human capital, and enterprise dynamics. Thirdly, globalisation affects these four pillars, and finally, there is increased emphasis on knowledge management. There is an acknowledgement that in future social and moral competencies, as well as technical ones, will be important and that social capital can support an innovative culture.

In contrast to Ásgeirsdóttir, Kahin (2006) highlights some of the major problems of knowledge policy and gropes at prospects for such policy. He does state the conventional wisdom that the generation and management of new knowledge is linked to innovation, wealth creation, and economic growth, and that there is a growing need for informed policy perspectives on knowledge (ibid., p. 1), but he goes on to bemoan that *"There is too much to know about knowledge to be able to make intelligent decisions about it" (ibid.)* and that *"Knowledge policies remain balkanised and isolated under different institutions and areas of expertise… as diverse as*

[2] For a critical exploration of the OECD's central role in propagating the concept of the KBE, see Godin (2006).

intelligence and security, K-12 education, healthcare, patents, agency rulemaking, research funding, and the dissemination of agency information" (ibid., p. 2). This balkanisation of knowledge policy is a reflection of the *"unspeakable complexity of the knowledge economy" (ibid.).* The latter leads Kahin (ibid., p. 5) to go some, but not all, of the way toward acknowledging that knowledge policy might benefit if it were informed by insights from happiness research: *"Judicious avoidance of knowledge is not necessarily a bad thing. Human attention and absorptive capacity are scarce. Opportunity costs may be high".* And further (ibid., p. 7):

> *"Politicians recognize the ascendance of knowledge, but what can they do about it? The exploding scope, volume, and significance of knowledge in the global economy now exceeds the more slowly developing analytic frameworks and statistical bases on which informed public policy can be made… We know from living that knowledge extends backward into its roots in the human psyche. We know that it spans the world outside and the world within.*
> *We may be slipping into the riddles and paradox."*

In another chapter, Kahin's co-editor discusses some broad themes that determine the extent to which knowledge use is 'optimised' (Foray, 2006), and which one would therefore also expect to be targeted by policy. The first one mentioned is the efficient and effective deployment of Information and Communication Technologies (ICT) as knowledge instruments. The development of new applications on part of the users of ICT (the "coinvention of applications") is seen as crucial to ensuring the effective diffusion of ICT after their initial invention. The second broad theme is that of institutions. To be more precise, it is the emergence, transformation, and path-dependent evolution of institutions devoted to the creation and transmission of knowledge in an efficient manner. Foray sees this as the essence of the 'economics of knowledge' as a discipline. To achieve such institutional improvements, he argues that policy makers should use the accumulated evidence on many aspects of the KBE (i.e. quantitative indicators) in order to develop 'evidence-based knowledge policies'. He finishes by saying that *"Knowledge policies are needed as tools to improve the working of institutions but also to inform larger social choices about what kind of institutions and mechanisms will lead to outcomes that are "optimal" at national, regional, and global levels" (Foray, ibid., p. 15).* Foray's chapter is remarkable in several respects. He seems to admit that so far knowledge policy has not been sufficiently based on 'evidence', but rather *"on a casual understanding and vague perception of problems and issues" (ibid., p. 14).* Also, he does not define what he means by 'efficient', 'optimised' and 'optimal' production and use of knowledge.

Gault (2006) surveys the official statistics measuring 'knowledge and its economic effects'. He admits that in their present state they are insufficient and calls for more and better indicators if we want more effective evidence-based policy. The only hint that a much wider range of indicators might have to be considered that goes beyond 'economic effects' is an acknowledgement that knowledge activities also give rise to wider policy issues, i.e. ethical issues (for example in relation to research on living things) and moral issues (for example in relation to cloning or stem cell research).

Schuller (2006) probably comes closest among the authors in Kahin and Foray (2006) to making a link between KBEs and happiness. Discussing the growth in the volume

of knowledge, he alludes to the relevance of nested hierarchies such as facts/information/knowledge/wisdom as relevant concepts and acknowledges that knowledge accumulation is not of course a simple linear process. He further comments that *"in any case, it is clear that the mere accumulation, even of wisdom (or whatever is conceived of as at the top of the hierarchy), is not enough to guarantee progress and satisfaction" (ibid., p. 84)*. However, he stops short of making an explicit connection between the KBE literature and that on happiness. Rather, he puts forward a framework for extending the analysis of social capital, especially trust, in the generation, distribution and verification of knowledge.

The need for a re-direction of information society indicators research

There is a large KBE-related, but somewhat separate, literature that focuses on information society indicators. I briefly comment on some recent assessments of the field and the research agendas proposed. They seem to come close to explicitly considering insights from happiness research.

Grigorovici et al. (2004) survey the literature on macro-level information society indicators and various e-readiness measures.[3] They lament the lack of a comprehensive theory guiding these efforts and propose constructing a multi-level multi-factor index based on a structural modelling approach. They agree that a vast range of social impacts of ICT needs to be measured and monitored, not just economic impacts. Also, to better understand KBEs, improved indicators are needed for measuring knowledge inputs, stocks and flows, outputs, networks and learning. They advocate that future research should develop closer links between information measurement models and Quality of Life models

> *"since ultimately the goal of any endeavour for measuring the "Information Society", "Technology Achievement" or "E-readiness", is to be able to quantify and track their impacts and changes on people's living conditions at various levels of analysis … Unfortunately, most of the e-metrics research done currently seems to have forgotten the real objective, ..." (ibid., p. 193).*

While Grigorovici et al.'s sentiments seem similar to mine, Quality of Life is usually perceived as a much broader concept than happiness. In fact, advocates of Quality of Life measures may explicitly reject the use of happiness measures (see, for example, Cobb, 2000).

More recently, Menou and Taylor (2006, p. 261) have commented that:

> *"In spite of a sustained public policy discourse over last several decades, the information society-related policies tend to be mushy products of an odd mix of futurology, social forces, aspirations, ideology, and interest-group politics, among other things. It is rarely*

[3] Composite indices that try to capture some essential but elusive feature of KBEs have mushroomed. A recent example is the International Telecommunications Union's (ITU, 2007) ICT Opportunity Index. Others include the ITU's 'Digital Access Index', the World Economic Forum's 'Network Readiness Index', the International Data Corporation's 'Information Society Index', the United Nations Development Programme's 'Technology Achievement Index', etc.

admitted that they should be informed by reliable observations and data."

In their view, developing appropriate 'information metrics' to measure important aspects of information/KBEs and societies and to guide policy is still a 'grand challenge', despite the long history of some of these efforts and their renewed proliferation in recent years. Menou and Taylor's (2006) aim is to show that alternative ways of measuring the information society are necessary and feasible. To meet the grand challenge, they see the need for a new coherent field of academic study that addresses a number of critical areas. Most of these challenges seem to point to the need to incorporate insights from happiness research, but again the authors never quite manage to make the connection.

One of the challenges identified by Menou and Taylor is 'to define the universe to be measured'. Achieving a universally accepted definition of information, knowledge and wisdom may be an open-ended undertaking close to the punishment of Sisyphus. However, they insist that some clarity and rigour is an elementary requirement and not beyond reach. The notion that information and mind are fundamental constituents of reality is mentioned in connection with this challenge. Another challenge is 'the definition of objects and phenomena to include in the universe'. Menou and Taylor observe that information measurements often are not comprehensive enough, excluding whatever is not informational, or at least not directly related to information resources and activities, as if informational and non-informational domains could exist without each other. A further challenge is to frame measures within established or in progress social theories. It is not yet clear to Menou and Taylor what the appropriate theories are. The challenge is to test those theories that seem relevant and promising.

The neglect of happiness research becomes even less understandable when one considers that another major challenge identified by Menou and Taylor is to find ways to bring back the ordinary citizen, who is supposed to benefit from the development of the information society, as key player in the process of observation, analysis, and assessment of the transformations taking place. The ultimate challenge according to Menou and Taylor (ibid., p. 265) is to "*advance our understanding and allow for enlightened actions that ensure that the information revolution does not lead to more damage than benefits,…*". I would argue that at least some of the data and new indices needed are already available from happiness research.

Only one of the four contributions introduced by Menou and Taylor (2006) comes close to the use of subjective survey data that I advocate in Section 5 below. In an Estonian case study, Pruulmann-Vengerfeldt (2006) argues that cultural and social indicators of various life domains need to supplement traditional technology-centric information society measures in order to properly assess the complexity of information society related issues. Of particular interest here is Pruulmann-Vengerfeldt's inclusion of questions about the general attitude of survey participants towards technology, and inclusion of lifestyle variables indicating which groups in society are more or less likely to adopt new technologies.

Some insights from the non-mainstream knowledge policy discourse

I briefly discuss an example of a group of non-mainstream analysts who go beyond the usual OECD policy discussion and explore deeper issues related to knowledge policy. Although they often get tantalisingly close to advocating the use of happiness/SWB data, they also stop short of explicitly advocating their use.

As the title of their book suggests, Rooney et al. (2003) concentrate on foundations and frameworks for public policy in KBEs, eschewing detailed and specific policy prescriptions. They employ a complex system paradigm in order to broaden what they perceive as a mostly naïve and inappropriate, i.e. narrowly technocratic, mainstream knowledge policy discourse that largely neglects or marginalises social, ethical and cultural dimensions.[4] Much in their story depends on an appropriate social environment, or the beneficial aspects of social capital:

> *"Knowledge is…a social as well as an individual quality that should flourish in an environment of plenitude, free exchange of ideas and learning. Settings in which anti-social behaviour predominates amount to poor economic settings for knowledge-based economies. Robust and purposeful relations and communication underpin such economies." (Rooney et al., 2003, p. 9).*

They therefore argue that knowledge policy must have a social and communication focus, and must go beyond a consideration of information- and technology-related issues only. Policymakers must implement policies to nourish, protect and harvest the knowledge commons, be ready for and exploit knowledge waves, and prepare communities for participation in KBEs. The latter includes policies to introduce cultural change away from ego-driven individualism towards sustainable consumption (ibid., chapter 8) and would seem to link easily to insights from happiness research. Also, the authors argue that a KBE should by definition be fair, equitable and just, all dimensions whose links to happiness might seem obvious. However, Rooney et al.'s parting comments in the book's epilogue take a different track. Similar to (but preceding) Schuller (2006), they extend the data/information/knowledge hierarchy by adding a top level, i.e. wisdom, without referring to the happiness literature:

> *"There is little understanding of wisdom in knowledge-related discussion generally…Just as more and more information does not necessarily make more or better knowledge, neither does more and more knowledge make wisdom…More and more knowledge is not a sensible objective…While knowledge can be wonderful, wisdom is better…Wise people...know better than others and are recognized as being people who know better. This means that wisdom is a scarce and valuable social quality that should be close to the centre of knowledge-related policy debates…" (Rooney et al., 2003, p. 154).*

In particular, they advocate an Aristotelian approach to (secular and practical) wisdom. In a later paper, Rooney and Mckenna (2005) elaborate this position at

[4] Rooney (2005) conducts a text analysis of a large body of policy documents from around the world to further substantiate his view about mainstream knowledge policy.

length and try to make a case for wisdom to become an explicit objective for KBEs. As they put it (ibid. p. 308):

> *"Without wisdom, any social or economic system is deficient because of the power of wisdom to provide good judgement, perspicacity, and ethically applied knowledge. Yet knowledge about how to be wise, how to foster wisdom, and how to recognize it has been lost in the dominant discourses of the industrialized world."*

In their view, unless critical and transcendent aspects of knowing, such as curiosity, creativity, insight and imagination, are accorded higher value in knowledge policy, there is little chance for wisdom to become an explicit objective for KBEs. However, the emphasis on creating knowledge and innovation at faster and faster rates and the associated rapid rate of change seems to have created a 'politics of urgency' that leaves little time for reflection and consideration (ibid.).

Without wanting to digress into a long philosophical debate, I would argue that Rooney and his co-authors might well be right about the 'ultimate goal' of wisdom as the key factor in deriving appropriate knowledge policy, but that the related (if possibly lesser but more measurable) human quality of happiness is an important, if not indispensable, ingredient in this quest. They might not disagree, as they sometimes refer to insights from psychology and neuroscience, but Rooney et al. never make the step towards embracing happiness research.[5]

3. Major policy issues in happiness research

Happiness researchers hold the view that happiness/SWB indicators add important information beyond that contained in the conventional economic and social indicators, and that they are therefore important in informing policy debates. They have not held back in offering policy advice, although little, if any, has directly and explicitly addressed the KBE discourse. I briefly discuss some of the major policy issues and controversies in happiness research as highlighted by a number of prominent researchers. This is not meant to be a representative review. Rather, I hope to convey the flavour of much of the current happiness policy debate.

The happiness paradox and the happiness of nations

The starting point for modern happiness research in economics is the observation that in the developed world, on average people are no (or not much) happier than 50 years ago, despite the large increases in real incomes over that time period. This is variously labelled the 'Easterlin paradox', due to the seminal work of Easterlin (1974), or the 'happiness paradox' (Layard, 2005).[6] It is due to certain features of human nature, in

[5] Also note that some happiness researchers, for example Helliwell (2003, p. 333/334), have explicitly commented on the link between Aristotelian philosophy and modern happiness research.

[6] For a brief review of this issue see, for example, Di Tella and MacCulloch (2006). Veenhoven, one of the pioneers of happiness research, has recently argued that since 1973 happiness has continued to increase in rich countries (Veenhoven, 2006). Using his concept of happy-live-years, which is a happiness index adjusted for average length of life, he finds that

particular the need for social comparisons (people care mostly about their relative income) and habituation to higher income (the hedonic treadmill). Layard (2005) argues that both features distort people's incentives and result in them striving to work too much and earn too much money, at the expense of their leisure. Also, income inequality is bad in the sense that extra income brings less benefit to the rich than the poor. How to increase happiness is the new challenge and frontier – and much more difficult than traditional wealth-creation. Layard does not add that wealth-creation in developed countries, with which he deals exclusively in his book, is largely and intensely knowledge-driven.

There seems to be a consensus amongst happiness researchers that most of the average level of happiness in a country (i.e. the 'happiness of nations') can be explained by a relatively small number of objective factors. Layard (ibid., ch. 5), summarising findings by Helliwell (2003), mentions the '"Big Seven": Family relationships, financial situation, work, community and friends, health, personal freedom and personal values.[7] Especially divorce rates and unemployment rates have major negative impacts on the happiness of nations.

Layard (2005) draws a wide range of specific policy conclusions from the findings about happiness/SWB, for example that the struggle for higher relative income should be discouraged by higher income taxes, that tax allowances for most advertising should be stopped, that policies should focus on improving the welfare of children and enable flexible working practises, that much more money needs to be spend on helping people with mental illnesses (only a fraction of whom receive treatment today). Moreover, he acknowledges (ibid., p. 145) that almost all policies, i.e. including those not specifically derived from happiness research, affect happiness through many channels.

Layard (2006) covers similar terrain, but aimed directly at economists, not the general public. He argues that the theory behind public economics needs radical reform (ibid., p. C24): *"The challenge to public economics is to incorporate the findings from modern psychology while retaining the rigour of the cost-benefit framework…"*. He concludes that economics uses exactly the right framework for thinking about public policy, but the wrong account of what makes people happy.[8] He sees a need for economics to become much more inter-disciplinary, requiring collaboration between economists and other social scientists, especially psychologists.

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life in modern society is generally getting better, and he expects this trend to continue. This is not due to the already happy getting happier, but to a reduced number of unhappy persons in the population. In most countries there has been a simultaneous rise in happiness and longevity. However, in the UK and US, happy life years have risen only due to the lengthening of life, not the degree of happiness. Only one country, i.e. Belgium, experienced a decline in happy-live-years (ibid.).

[7] More precisely, the following factors have been found to explain 80% of the variation of happiness reported in the World Values Surveys for 50 countries: the divorce rate, the unemployment rate, the level of trust in society, membership in non-religious organisations, quality of government, the fraction of the population believing in God (Layard, 2005, p. 71).

[8] Layard (2006, p. C31) states that *"Broadly, economics says that utility increases with the opportunities for voluntary exchange. This overlooks the huge importance of involuntary interactions between people – of how others affect our norms, our aspirations, our feelings of what is important, and our experience of whether the world is friendly of threatening."*

Ng and Ho (2006) provide what could be called an East Asian perspective on happiness policy. They agree that public policy can contribute to the pursuit of happiness at the individual level. However, given the track record of public policy in some of the fast growing East Asian countries, sometimes it might imply governments doing less. In Ng and Ho's words (ibid., p. 3): *"…although we agree that governments do not have to, and indeed should not, pursue happiness for their citizens, they can facilitate that pursuit by creating an environment that favors such pursuits."* In particular, they emphasize the importance of the rule of law and basic freedoms that are common in today's democratic nations. In the concluding chapter of Ng and Ho (2006), however, one of the editors is more explicit about the public expenditure implications of happiness research. Ng (2006) argues that happiness studies imply that the optimal level of public spending is higher than most economists believe, and that diversion of resources from the private to the public sector in 'appropriate' areas (like research, education, health and environmental protection) are likely to be welfare enhancing.[9]

What can economists learn from happiness research?

Frey and Stutzer (2002) specifically ask the question what economists can learn from happiness research. While they do not directly mention KBEs anywhere, some of the issues they discuss will be taken up again in Section 4 below.[10] Frey and Stutzer first discuss reasons for economists to consider happiness research: i) Happiness is generally considered an ultimate goal of life. ii) It should be important for economic policy. At the micro-level, Pareto-improving policies are often impossible, i.e. social actions usually entail costs for some individuals. Hence, they argue, an evaluation of the net effects, in terms of individual utilities, is needed.[11] At the macro-level, economists deal with trade-offs, especially that between unemployment and inflation, and happiness research emphasises the high non-pecuniary costs of unemployment which should be taken into account in economic policy decisions. iii) As their own research has highlighted, happiness is influenced by institutional conditions such as the quality of governance and the size of social capital. iv) Happiness research can help economists to understand the formation of SWB in general, thereby shedding new light on basic concepts and assumptions of economic theory and also on some empirical puzzles. In particular, happiness researchers have found consistently large influences of nonfinancial variables on self-reported satisfaction, which arguably should be taken into account alongside economic variables. However, causality issues loom large, i.e. economic variables like income, unemployment, and inflation, as well as institutional factors, affect happiness, but happiness might also affect these variables in turn.[12]

[9] Also see Ng (2002a,b). He regards increased public spending in these areas as a way to overcome the East-Asian countries' 'happiness gap' (i.e. their very low happiness scores despite spectacular economic growth).

[10] Also see Di Tella and MacCulloch (2006) who provide a shorter but more recent survey covering much of the same ground.

[11] Frey and Stutzer (2002) discuss at some length why they regard reported SWB as a satisfactory empirical approximation of individual utility.

[12] On this point, see the more extended discussion in Diener and Seligman (2004).

In the summary section of their survey paper, Frey and Stutzer (2002) discuss major implications for economic policy. For example, they argue for the use of happiness measures in the evaluation of the effects of government expenditure. Also, welfare policy needs to focus more on creating employment instead of financial support for the unemployed because the latter will only compensate for the pecuniary losses of unemployment. The definition of poverty should be changed to focus on SWB instead of disposable income, i.e. antipoverty policy should be redesigned in light of findings from happiness research. Tax policy should take effects on SWB into account, although Frey and Stutzer are much more cautious in their policy prescription than is Layard.

Finally, Frey and Stutzer (2002) discuss a number of open issues in happiness research where progress is especially needed: i) *Effects of happiness on behaviour;* happiness may influence many important economic decisions (for example with regard to consumption, work, investment, political behaviour). This is the issue of reverse causality. ii) *Application of happiness analysis in further areas* (discrimination of women, quality of life indicators, growth analysis), emphasising a broader set of institutions than done so far. iii) The application of more advanced methods of analysis (using panel data instead of cross-section data). iv) Further improvements in happiness measurement. Suffice it to say that all of these issues are still with us.

Economists focussing on happiness research take most of their clues from psychologists. Not surprisingly, the latter tend to produce the more comprehensive and detailed accounts of psychological findings relevant to happiness research. Diener and Seligman (2004), for example, mention research on the potentially negative effects of materialism, such as low self-esteem, greater narcissism, less empathy, less intrinsic motivation, more conflictual relationships, greater emphasis on social comparisons (the hedonic treadmill) and, generally, put more emphasis on what seems to be an epidemic of mental disorders in wealthy societies, all of which contribute to stagnant life satisfaction. They regard mental health as an area in which historical trends in SWB have been startlingly and strongly opposite the trends in economics, and where governmental and institutional policies can make an enormous difference to well-being, a theme which has also been taken up by Layard.[13] Diener and Seligman do not explain what the increase in mental disorders in wealthy countries is mostly due to. They call it a paradox (ibid., p. 16). However, one is tempted to ask whether the rise in mental disorders and the rise of KBEs are co-incidental, or in some way causally related.

Should policy aim at directly maximising national happiness?

Frey and Stutzer (2007) ask the important question whether public policies should be *directly* aimed at maximising national happiness. Should happiness maximisation be the ultimate goal by which policy success is measured? Should aggregate happiness, now that it can be measured adequately, be maximised as a social welfare function?

[13] They note that mental health is an area where economic indicators and SWB can easily move in opposite directions, i.e. costs associated with treating mental illnesses can increase GDP, while the prevalence of mental illnesses reduces SWB (Diener and Seligman, 2004, p. 17). This trend will only increase in future should more people receive treatment.

This issue is hotly debated amongst happiness researchers. Layard (2005, 2006) explicitly advocates this goal. Others do so implicitly.[14] Frey and Stutzer, however, like Ng and Ho (2006), disagree. They provide arguments for their alternative view that insights gained from happiness research should be taken as (one among many) inputs into the political process, i.e. they should improve the nature of the political process. In their view, different issues require different measures and indicators of well-being. They do not, however, argue against using aggregate happiness indicators. They are important macroeconomic inputs in the political discourse, helping to overcome the currently dominant orientation towards GDP. Frey and Stutzer just argue against explicitly trying to maximise them.

Kahneman and Krueger (2006) position themselves somewhere in the middle of the spectrum. They argue that a measure of Gross National Happiness would seem an overly ambitious goal given the present state of knowledge. They therefore advocate the use of SWB measures as a complement to traditional analysis.[15] Similarly, Diener (2006) has proposed guidelines and recommendations for the development and use of national indicators (note the plural!) of SWB and subjective ill-being in policy debates, which were endorsed by a list of fifty-one prominent researchers. The use of multiple SWB indicators is suggested by the diversity of policy domains where findings from happiness research should be relevant.[16] It can be expected that the existing measures of national well-being will undergo substantial developed in future, and that additional measures will be development and refined over time.

Intimately related to this discussion is that of the political neutrality, or otherwise, of well-being indicators. Some prominent happiness advocates, such as Layard, might give the impression that happiness/SWB considerations are part of a leftist agenda.[17] By contrast, Diener and Seligman (2004) believe that SWB measures are and must remain descriptive, not prescriptive. They *"simply yield facts that can be used either by the left or by the right, and ... they provide an added way to better assess the claims of various political viewpoints by revealing how policies actually influence wellbeing" (ibid., p. 24)*. Diener and Seligman note that the issue of political neutrality of happiness/SWB indicators does not seem different from that of any other type of indicator (for example economic indicators).

[14] For details, see Frey and Stutzer (2007).

[15] They also propose their own alternative SWB indicator, or rather misery indicator, the U-Index (for 'unpleasant' or 'undesirable'). This indicator is fundamentally connected to time allocation, measuring the proportion of time that people spend in an unpleasant state. Kahneman and Krueger regard this measure as particularly well-suited for cross-country comparisons.

[16] According to Diener (2006), indicators of subjective well-being and ill-being can be used for the evaluation of policies in such diverse areas as health care, public health, social services, parks and recreation, work life, transportation, families, and the environment.

[17] However, the most extreme policy conclusions are not presented by Layard but by various authors of books on 'affluenza' written for a wide audience (see, for example, Hamilton and Denniss, 2005).

4. Some major interfaces of knowledge policy and happiness policy discourses

Policies concerned with KBE issues directly and/or indirectly impact on happiness. However, as the discussion in Sections 2 and 3 has highlighted, the knowledge policy and happiness policy discourses have so far taken place without much direct interaction or mutual acknowledgement. Below I highlight some of their more obvious interfaces as suggested by my reading of the literature. They all concern the nexus of education, work, and innovation, which is at the core of KBEs.

Education

It is taken as self-evident that life-long education and learning in all its forms is central to facilitating, and coping with, the accelerating speed of change associated with the development of successful KBEs (OECD, 1996). It is a pre-requisite for obtaining 'decent' employment in a rapidly changing world (Reich, 2002), for speeding-up progress in science, technology and innovation, and for productivity growth. Lundvall and Johnson have coined the term 'learning economy' to highlight this central feature of KBEs.[18] However, Helliwell (2003) reports, somewhat surprisingly, that education does not figure among his "Big Seven" factors having major direct impacts on happiness. Indeed, he finds education to have only small and insignificant effects. The positive effects of education on happiness are already captured by some Big Seven factors, especially income, health and trust, all of which are positively affected by an increase in education levels. In short, education seems to affect happiness mostly indirectly through its impact on other variables. This might be an important reason for the disconnectedness of much of the current knowledge policy and happiness policy literatures.

Fortin (2005) seems to be one of the few analysts so far who puts forward a policy recommendation for economic growth in an advanced KBE that is explicitly influenced by insights from the happiness/SWB literature. He argues that instead of investing more in university education and training (the standard prescription derived from new growth theory) *"Our foremost objective should be to raise average labour productivity not as much by encouraging our already productive as by bringing the low-productivity segment of our workforce closer to the median" (ibid., p. 3)*. In short, raising the skill levels of people at the bottom of the skill distribution is more likely to produce growth, reduce income inequality, and increase SWB.[19]

Knowledge work, productivity, stress, unemployment

The 'human factor' is central in KBEs because the crucial resource in such economies, i.e. knowledge, is mostly (and will mostly remain) centred in human brains, despite attempts to develop 'expert systems' for knowledge capture and decision making. In KBEs many more outputs then previously are either mostly the product of human brain activity and/or more intensive in such activity, at least until

[18] For a discussion of the similarities and differences of the concepts of the KBE and the learning economy see, for example, Lundvall (2002).

[19] Frey and Stutzer (2002, p. 412) reference some research that suggests that the impact of income inequality on happiness varies between countries (Americans, for example, have less aversion to income inequality than Europeans). However, they also note that the impact of income inequality on happiness is a so far under-researched topic.

we enter the cyborg age or finally fulfil the old and so far elusive fundamental promise of artificial intelligence research. But this seems precisely the problem: Human brains are fragile, somewhat fickle and prone to malfunction, especially when put under pressure and managed inappropriately. Is it a coincidence that happiness in developed countries seems to have been stagnant since about the same time that researchers have noted the rise of the information/KBE and the rapidly increasing number of information/knowledge workers?[20]

Lamberton (1997) has suggested that the mainstream KBE discourse misses the real significance of the dichotomy between tacit and codified knowledge. In essence, the role and importance of tacit knowledge is often underappreciated because it stands for the intrinsically subjective human element in knowledge production and transfer which is very difficult to measure and therefore often downplayed or forgotten. The dangerous belief now is that all important knowledge can be codified (ibid., p. 79). This is arguable an important reason for the often found pre-occupation with measurable aspects of KBEs, especially ICT and codified knowledge. In short, despite the enormous increases in the degree of codification of existing knowledge enabled by the developments in ICT, a large amount of knowledge is, and will remain, tacit and intangible, and therefore difficult to measure and manage.

This was also recognized by Drucker (1999), who pointed out that the biggest contribution management needs to make in the 21st century is to increase the productivity of knowledge workers. Productivity increases comparable to those achieved by manual labour during the 20th century seem difficult to realise. Productivity growth in KBEs requires constant experimentation and re-organisation of work practices in order to reap the benefits of investment in ICT (see, for example, Bryjolfsson and Hitt, 2000), often leading to unhappiness and stress which in turn is known to reduce productivity.[21] Therefore, policies aimed at producing a happier workforce are likely to go beyond enhancing the SWB of workers. They also increase productivity and profitability (Diener and Seligman, 2004). They should, therefore, be at the centre of attempts to increase productivity in KBEs.

It has long been established that work can be a source of great happiness. It all depends on the nature of work and work practices.[22] The issue whether KBEs, by their very nature, lead to increased mental health problems still seems undecided. For some, there is no question that work in KBEs reduces happiness. Cohen (2003), for example, argues that the new nature of work and work organisation in KBEs gives rise to an epidemic in work-related mental stress and mental illness. This is due to the

[20] Machlup's seminal book alerting fellow economists to the importance of knowledge production and distribution in the US economy was published in 1962 (Machlup, 1962).

[21] Layard (2005) has pointed out that management practices often reduce happiness by creating stress, especially if pay is performance-based while performance can't be assessed objectively or easily, which seems typical of much knowledge work. In such situations people often get obsessed with how they rank compared to their peers.

[22] For a survey of findings on well-being effects resulting from work, see Diener and Seligman (2004). In general, people must have a feeling of control over what they do and work must be an outlet for one's creativity. People seem to be most happy when they experience what psychologists call 'flow', i.e. being lost in a task that stretches a person without defeating him/her. Flow is a state of intensive and focused concentration in which enjoyment is maximised (Lakhani and Wolf, 2005).

fact that work intensity has increased because productivity gains are being sought through multitasking enabled by the use of ICT, pushing as many tasks as possible onto individuals. In Cohen's (ibid., p. 39) words: *"Stress becomes the way to regulate post-Fordist society. Living work becomes live work and the limit to the new labor organization of work is burnout"*.

There is also a long-established and extensive disciplinary and inter-disciplinary literature on the topic of 'information overload' faced by many knowledge workers, i.e. of having too much information instead of less, but useful and relevant, information.[23] This can cause stress and anxiety, and impede decision making. The problem is only likely to grow in future. A recent study found that in 2006, the amount of digital information created, captured and replicated was about three million times the information in all the books ever written. It also forecasts a six fold annual growth in digital information from 2006 to 2010 (Gantz et al. 2007). In the presence of information overload, more information does not lead to better decision making. Instead, it is often better to base decisions on a few key facts or on tacit (i.e. unconscious) knowledge. This idea has also been popularised by Gladwell (2005), who argues that decisions made very quickly (snap judgements) can be every bit as good as those made after long deliberation.

However, there are also dissenting voices. Veenhoven (2006, p. 39/40), for example, has countered the argument that life in modern society has increased the incidence of mental illness, particularly depression. At least at the aggregate level of analysis, he sees little evidence that KBEs have had a negative impact on happiness, rather the opposite.[24] It seems the impact of work on happiness remains a highly contested topic. Moreover, how work practices and industrial relations in KBEs will evolve is, of course, uncertain,[25] and so are the effects these developments might have on the happiness of workers.

If work in KBEs is bad for happiness, unemployment is definitely worse. This seems to be a consensus opinion among happiness researchers. Being unemployed, even when receiving the same income as when employed, reduces people's happiness. While work may be a burden, losing ones job does not just result in lost income, but a loss of sense of self, and great psychic and social costs. In fact, unemployment seems to reduce happiness more than any other single characteristic (Frey and Stutzer, 2002). Layard (2005, p. 68), therefore, concludes that low and stable unemployment must be a major objective for any society. The difficult and controversial issue facing policy makers is, of course, how to get there in KBEs characterised by accelerated change. The answer will very much depend on one's political convictions.

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[23] For an introduction to this literature see, for example, the surveys by Eppler and Mengis (2004) and Edmunds and Morris (2000). Synonymous with or closely related to information overload are terms like 'cognitive overload', 'sensory overload', 'communication overload', 'knowledge overload', 'information fatigue syndrome', 'infoglut', 'information deluge', 'data smog', 'analysis paralysis', 'information pollution'.

[24] It is possible that in modern societies people are simply more aware of how they feel. However, even if there has been a real rise in rates of depression, that can still co-exist with a rise in average happiness (Veenhoven, 2006, p. 40): *"Modernization can be to the advantage of a majority, but can come at the expense of a minority, who are pushed into depression; ..."*.

[25] Hodgson (1999) puts changing work practices and industrial relations at the centre of his search for possible KBE futures and sketches no less than seven possible scenarios.

Innovation

Mainstream KBE analysts seem to have a rather limited view of the impacts of knowledge creation and innovation. As mentioned earlier, Foray (2006), commenting on what he sees as the essence of the economics of knowledge as a discipline, focuses on the role of socio-economic institutions to produce knowledge in an 'efficient manner', with the familiar conflict between 'social well-being' and private returns to knowledge being at the heart of the problem:

> *"The unifying framework here is the character of knowledge as a semipublic good, with difficult-to-enforce property rights. Its diffusion is in principle good for social well-being but bad for private returns: No one wants to invest in the creation of new knowledge if the rents generated are not at least partly appropriable. Institutions that govern the creation and diffusion of knowledge are shaped by this trade-off: On the one hand they need to meet the objective of providing the ideal motivation to the private producers of knowledge while on the other they have to fulfil the social objective of ensuring efficient use of knowledge once it has been produced." (Foray, 2006, p. 11).*

It appears to be symptomatic of the disjuncture between the economics of knowledge and happiness economics that Foray is silent about the impact of knowledge production, as a process, on the well-being of knowledge producers. Rather, he links social well-being to the subsequent use of the knowledge created.

Turning to happiness researchers, Layard (2005, ch. 6) seems to be one of the few who puts the rise of KBEs at the heart of the happiness paradox. He regards S&T, which are core elements of KBEs, as the prime source of the changes that affect people's attitudes and feelings. S&T have been responsible for the rise in our material standard of living and improvements in physical health, but they have also created offsetting negative trends that have negated the positive effects. In particular, he mentions adverse trends in changes in family life (broken families), weaker moral values (for example more crime) and declining community trust that have negatively affected happiness in rich countries. Layard argues that they are due to changes in gender roles, the spread of television and the growth of individualism, all of which have been ultimately driven by S&T.

Apart from questioning this type of S&T determinism in general, one may also question some of the specific 'negative effects' mentioned by Layard, like, for example, labour-saving technological changes that allow women to reduce time spend on housework and join the paid workforce, or the fall in child mortality due to better health technology, or birth control technologies, or the decline in religious belief and the moral vacuum it has allegedly created, which, at least at first sight, might seem somewhat simplistic. However, what Layard (2005) has done is to put the links between KBEs and happiness research firmly on the agenda, although he never explicitly mentions the term KBE.

Weehuizen et al. (2006) try to make the links between innovation in KBEs and happiness explicit. They report preliminary findings from a model that incorporates

the role of innovation as 1. a source of productivity growth 2. a source of stress affecting 'mental capital'. They find that moderate stress might go hand in hand with productivity growth, while high levels of innovation may be counter-productive if they lead to high levels of stress that people cannot cope with. When Weehuizen's (2006) final report was released, it created headlines like *"Mental health problems threaten the knowledge economy"* (UNU-MERIT, 2006). The attempt to increase knowledge worker productivity is reported to unequivocally damage KBEs' mental capital. Giving knowledge workers more autonomy is adding substantially to their workload and pressure. Many knowledge workers find this difficult to mange, leading to ever greater levels of stress and mental health problems (ibid.). Governments should therefore invest more in the treatment of mental health related problems as well as into prevention. Weehuizen is reported to have said that *"Each Euro spent on treatment of mental health related problems saves 20 to 30 Euros in future costs…" (ibid.).*

The relationship between innovation and happiness in KBEs is a vast and multi-faceted topic that does not lend itself to simple answers. Happiness researchers seem to focus mostly on the negative impacts of innovation on happiness. Below I briefly discuss two issues reported in the literature that point to the possibility that in developed economies at least, causality might increasingly run from happiness to innovation and economic growth, i.e. happiness might increasingly become an explanatory variable in advanced KBEs.[26]

Happiness is increasingly being mentioned by mainstream and non-mainstream analysts that focus on incentives or motivating factors for creative labour. For example, von Hippel (2005, 2006) emphasizes the phenomenon of user innovation, i.e. the democratising of innovation, often accompanied by users freely revealing their innovations. Enjoyment derived from innovating and problem-solving might tilt the balance of users' innovate-or-buy decisions towards the former, both in terms of commercial and not-for-profit activities (von Hippel, 2006, p. 242-244). Others have focussed more narrowly on open source. They have included the role of having fun or joy derived from voluntary contributions to code of software products as at least one of the motivating factors for such activities (Hertel et al., 2003; Lakhani and Wolf, 2005; Lerner and Tirole, 2006). Whatever the specific activity, fun or joy can lead to 'flow'.

A closely related, but more speculative, issue is that of the role of happiness in shaping what might come after the current mostly proprietary-based KBEs. Benkler (2006), for example, argues that commons-based peer production activities conducted over the internet, which he terms 'social production', are emerging as a distinct mode of resource allocation and production of information, knowledge and culture in the digital age, potentially heralding a new stage in the development of KBEs. Social production is achieved by sharing creative labour and/or physical resources over the internet. Examples include SETI@home, Linux and Wikipedia. There is some evidence that cross-country variation in the participation in social

[26] There seem to be only a few studies so far that directly explore the hypothesis that causality runs from happiness to economic outcomes. Examples are Kenny (1999) and Graham et al. (2004).

production projects might be related to the level of average happiness in a country, but more research is needed.[27]

Mainstream KBE analysts are also beginning to recognise the new social organisations that enable rich voluntary spillovers and the importance of public knowledge (the knowledge commons) in general. Foray (2006, p. 14), while not going as far as Benkler, argues that these developments point to *"an emerging paradigm of open, distributed systems of innovation and learning"*. At present, however, social production is still a peripheral phenomenon existing alongside the proprietary-based KBEs that are the subject of the mainstream knowledge policy discourse.[28]

The realisation of Benkler's vision of social production being a mature feature of a new 'networked information society' depends on whether an institutional framework and policies that support, or at least not hinder, social production can be put in place and defended against competing interests of commercial producers, and other threats. The stakes for economic progress are potentially very high if it is true that optimising institutions for price-based production undermines social production, and if it is also true that current technological changes are improving the efficiency of social production. In that case, Benkler (2004, p. 281) argues, *"we are making systematically mistaken policy choices not on the peripheries of our economies and societies, but at their very engines."* I argue that discussions about the future direction of KBEs would benefit from research that explores the links between social production and happiness economics.

5. Diversity of beliefs and values about core KBE elements

Inglehart et al. (2004) highlight the enormous cross-country diversity in people's beliefs and values, including major and systematic differences between the groups of poor and rich countries, that emerge from the World Values Surveys. In their interpretation, SWB is a good proxy for the extent of 'self-expression values' in affluent societies, which themselves proxy for post-material values. By contrast, poor countries are characterised by 'survival values'. The point I wish to emphasise is that even within a group of fairly homogenous rich countries, people's beliefs and values about core KBE elements differ, sometimes greatly. These differences should be taken into account in the formulation of knowledge policy. Table 1 is included merely to indicate this diversity and how quickly beliefs and values can change over time.

[27] See my analysis of the paradigmatic social production project SETI@home (Engelbrecht, 2007). I find that in rich countries there is indeed statistically significant evidence of a positive correlation between the level of SWB and social production in terms of SETI@home. One interesting issue raised by Benkler is that of the importance, or otherwise, of social capital. He argues that it is not a prerequisite or social production, which mostly involves only very weakly connected communities or even total strangers.

[28] Kenway et al. (2006) argue that the dominant knowledge policy discourse is haunted by alternative economies, i.e. what they call the risk, gift, libidinal and survival economies. In their view, these alternative exchange systems are not normally acknowledged as this would highlight the shortcomings of the dominant discourse. Kenway et al. (ibid., p. 6) seek to *"take 'the economy' and 'knowledge' out of the hands of the economists"*. In short, they seem to be proposing to throw the baby out with the bathwater.

The countries included in the table are either English speaking or part of Protestant Europe (see ibid., Figure 2, p. 14).

The 'opinion about scientific advance' variable is the percentage of people who responded 'will help' to the question "In the long run, do you think the scientific advances we are making will help or harm mankind?" (ibid., Table E022). The 'more emphasis on technology' variable is the percentage of people who answered 'good' to the question: "I'm going to read out a list of various changes in our way of life that might take place in the near future. If it were to happen, do you think it would be a good thing, a bad thing, or don't you mind? More emphasis on the development of technology." The 'trust' variable is the percentage of people who answered 'most people can be trusted' to the question: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (ibid., Table A165). The 'feeling very happy' variable is the percentage of people who answered 'very happy' to the question: "Taken all things together, would you say you are:" (ibid., Table A008). *SWB* is the widely publicised subjective well-being ranking based on combined happiness and life satisfaction scores from the World Values Survey.[29]

Table 1: Diversity of beliefs and values about science, technology, trust and happiness in a group of rich countries

	Opinion about scientific advance (%)		More emphasis on technology (%)		Trust (%)		Feeling very happy (%)		*SWB*
	1990 wave	**2000 wave**	1990 wave	**2000 wave**	1990 wave	**2000 wave**	1990 wave	**2000 wave**	**2000 wave**
US	63	**56**	70	**57**	52	**36**	41	**39**	**3.5**
Canada	55	**52**	63	**58**	52	**39**	30	**44**	**3.8**
Australia	-	**57**	-	**58**	-	**40**	-	**43**	**3.5**
NZ	-	**26**	-	**35**	-	**48**	-	**33**	**3.4**
Great Britain	48	**40**	64	**70**	44	**30**	38	**-**	**2.9**
Ireland	40	**41**	61	**69**	47	**35**	44	**42**	**4.2**
Sweden	47	**44**	35	**35**	66	**66**	41	**37**	**3.4**
Norway	36	**39**	47	**46**	65	**65**	29	**30**	**3.3**
Denmark	43	**-**	59	**62**	58	**67**	43	**45**	**4.2**
Finland	42	**-**	68	**55**	63	**58**	20	**24**	**3.2**
Iceland	54	**66**	69	**85**	44	**41**	41	**47**	**4.2**
Germany	52	**51**	83	**63**	26	**35**	14	**20**	**2.6**
Netherlands	37	**-**	47	**48**	56	**60**	48	**46**	**3.9**
Switzerland	-	**39**	57	**34**	43	**41**	36	**40**	**4.00**

Source: Inglehart et al. (2004)

[29] Inglehart (2005, p. 11) explains the construction of *SWB* as follows: *"Happiness was rated on a four-point scale, on which high scores indicated low levels of happiness; life satisfaction was rated on a ten point scale on which high scores indicated high levels of satisfaction. To give both variables equal weight, the mean scores on the happiness scale were multiplied by 2.5 and subtracted from the life satisfaction scores."*

The percentage of respondents who thought scientific advance will be helpful in the long-run has fallen in most of the countries shown for which data for both years are available, with the exception of Iceland, Norway and Ireland. This is interesting, given that the countries in Table 1 are likely to account for a large proportion of worldwide R&D spending aimed at pushing out the knowledge frontier. The changes over time in the percentage of respondents who thought that more emphasis on the development of technology is a good thing are even more diverse, being about evenly split between rises and falls. Trust seems to have fallen in all English speaking countries, but there are an even number of falls and rises for Protestant European countries.[30] The percentage of respondents feeling very happy has risen in seven out of the eleven countries shown for which data are available from both WVS waves.

I argue that differences in societies' attitudes concerning central elements of KBEs, such as those shown in Table 1, are a neglected aspect of the mainstream knowledge policy discourse. They should be included as more KBE-specific SWB indicators alongside a general SWB variable and 'standard' economic and social variables.[31] The precise way this is done and the weight they should be given relative to other indicators will depend on the question at hand and should be a legitimate topic for debate.

KBE-specific SWB indicators might also be usefully included when devising typologies of KBEs. KBE typologies at various levels of geographical aggregation are being used in policy circles. For example, a recent report to the European Commission (Technopolis, 2006) evaluates European Union policies towards the development of KBEs at the regional level. Its authors extract four key factors from 15 KBE indicators that are then used to develop a typology of regional KBEs. People's beliefs and values are not among the 15 indicators the analysis is based on although some, like the unemployment rate and levels of education, will affect SWB directly and/or indirectly. In short, a KBE typology that includes both objective and subjective variables remains a task for the future. Such a typology might help us get closer to the formulation of wisdom-based knowledge policy.

6. Concluding comments

In this paper I have highlighted some of the key features of the current state of two major policy discourses, i.e. that of knowledge policy and of happiness policy, and their major interfaces, without pretending to have produced an exhaustive or necessarily representative survey. The discussion has been fairly general. However, there seems to be enough evidence from mainstream KBE analysts themselves to suggest that the currently unsatisfactory state of knowledge policy is pointing in the direction of including insights from happiness research. If it is accepted that happiness is the ultimate aim of economic activity, we arguably need a much closer relationship

[30] The responses to the questions are also available by gender, as well as by age, education and income group etc. (see Inglehart et al., 2004). For example, there are clear differences in the responses to the science and technology related questions by gender, with the percentage reported being higher for males than females (except for Ireland).

[31] Note that Diener and Seligman (2004) and Diener (2006) argue that use of more specific SWB measures in addition to an overall measure of SWB will often be desirable.

between the two policy discourses. This would seem a promising step to get us closer to wisdom-based knowledge policy.

People's beliefs and values about specific core KBE elements should be taken explicitly into account in the formulation of knowledge policy. They provide additional vantage points highlighting the complexity and diversity of KBEs and societies which goes beyond that currently captured by mainstream economic and social indicators. The development of specifically KBE-related SWB indicators should be part of the search for a list of national SWB indicators being advocated by Diener and Seligman (2004) and Diener (2006). Which combination of subjective variables should be used will depend on the particular policy question at hand.

Somewhat paradoxically, KBEs have increasingly become 'unknown' economies. This has produced repeated calls from mainstream analysts to develop more and more economic and social indicators to capture the elusive qualities of KBEs. However, it seems unlikely that the proliferation of KBE indicators can achieve what its developers hope for. Similarly, various international organisations seem constantly to be developing new composite indices that try to capture how well countries are prepared for the KBE. By definition, composite indices combine important elements that should be analysed separately, but more than anything they seem to fulfil the deep psychological need of analysts and policy makers to rank countries.

There are signs that the lack of explicit mutual recognition and interaction of knowledge policy and happiness policy discourses highlighted in this paper might be slowly changing. For example, in the 2006 edition of the OECD's publication "Economic Policy Reforms: Going for Growth" (OECD, 2006), the last chapter entitled "Alternative measures of well-being" contains at least one page on happiness/SWB measures. Also, the OECD, as well as other international organisations, is sponsoring or co-organising conferences on happiness.[32] One may, therefore, hope that at some point in the not so distant future insights from happiness research will be taken into account in knowledge policy formulation.

[32] To name but two recent examples: The international conference "Is happiness measurable and what do those measures mean for policy", University of Rome "Tor Vergata", Rome, 2-3 April 2007, and the second OECD World Forum on "Statistics, knowledge and policy", Istanbul, 27-30 June 2007.

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