Reflections on Measuring and Improving Productivity When Subjective Well-being Is the Objective

John F. Helliwell
University of British Columbia[1]

It marks an important step to expand the study of productivity to treat subjective well-being rather than GDP as the objective. At the national level, this might involve using an aggregate equation explaining national average life evaluations instead of a production function explaining GDP in terms of labour, capital and natural resources. Earlier attempts to expand GDP-based measures of productivity to something more appropriately reflecting underlying utility have involved correcting GDP in the manner suggested by Nordhaus and Tobin (1973), and also by Stiglitz *et al.* (2009) without implying any fundamental changes to how productivity analysis should be done.

A middle ground might involve moving away from the production side towards the income side, as Nick Oulton (2022) has done. This comes closer to the geographic and conceptual basis of the well-being approach by focusing on the people rather than the production process itself. That is also, on a geographic basis, likely to permit delving into narrower geographies better than does the pure capital/labour production model assumed by Agarwala *et al*, (2021).

To move the basic measure of output from produced goods and services to subjective well-being requires a much more fundamental transformation. First, it is necessary to choose a preferred measure of subjective well-being that has reasonably good claims to represent utility. The choice has generally favoured an umbrella life evaluation measure that has claims to include due account for income and health, the quality of institutions, the quality of the social context, and the variety of positive and negative emotions that affect how people feel about their lives (Helliwell, 2021). These umbrella life evaluations are typically given by answers to questions asking people to rate their current lives on a scale running from 0 at the bottom to 10 at the top. Alternative versions of this ques-

1 The author is Professor Emeritus in the Vancouver School of Economics at the University of British Columbia. Email: john.helliwell@ubc.ca.

tion ask about satisfaction with life, about happiness with life, or as a ladder that uses 10 as the top and 0 the bottom of possible lives. The levels of the answers to these alternative formulations can differ, but their estimated linkage to the various explanatory factors is remarkably similar (Helliwell, *et al.* 2017:10-12, and Helliwell, 2021), and the relative importance of the key variables is remarkably consistent around the globe (Helliwell *et al.*, 2015).

How to measure well-being productivity? The simplest first step might be to ask how well countries do at converting conventionally measured GDP into life evaluations. But if it is possible to prepare a credible list of other factors contributing to higher life evaluations, then a regression of life evaluations on these variables provides what might be thought of as a production function for well-being. What might be an appropriate measure of efficiency? It is possible to simply treat the underlying variables as inputs analogous to the capital and labour inputs appearing in a production function for GDP, and to treat the residuals as a measure of efficiency analagous to X-efficiency or some combination of Solow residuals (or Solow/Swan residuals in antipodean accounts like those of Tim Hazledine (2022), and of Jaime Legge and Conal Smith (2022)), and a time trend. But what then? If some nations are happier than others, whether because they have higher values for the variables explicitly included in the well-being equation (as explained by Sarracino and O'Connor (2022), the six variables used in the WHR modelling are GDP per capita, healthy life expectancy, someone to count on, perceived freedom to make key life choices, generosity, and trust, as measured by the absence of corruption) or because they have positive residuals for the underlying equation, how can this be used to signal where efforts could best be directed to make for happier lives? There are no easily established production models for the creation of any of the five WHR variables beyond income, and even less is known for additional factors not included in the available data and modeling.

An alternative approach is taken by Legge and Smith (2022), who add social capital and natural capital to produced capital and labour to estimate total factor productivity for well-being after using an exogenous adjustment for possible response bias based on the well-being responses of immigrants. They find, reasonably enough, that the well-being consequences of the four capitals are very different. This is not the place to comment in detail on these results, but their Figure 3 suggests strongly that their use of immigrant well-being differences to identify response biases has produced a positive response bias in the Nordic countries where straightforward analysis of residuals in global well-being equations with common global parameters would not give that result.

I suspect that if they shifted to a more global data sample, their results would be very different. Analysis of migration from very many countries to a given destination has indeed shown limited evidence that immigrants from some source countries have higher or lower life satisfaction than their locally born counterparts (Helliwell, Shiplett, and Bonikowska, 2020). But the differences are very small, and, as with Legge and Smith, are as amenable to ex-

planation by advantages and disadvantages that migrants bring with them as by what they describe as cultural bias.

The most valuable feature of that part of their analysis is to provide a robustness check on the main features of their results. If plausible scales for differing local response styles or unmeasured cultural influences do not change the key conclusions in a material way, that increases the weight that can be attached to the results. The same applies, of course, for the use of alternative assumed functional forms for the models used by them and others to explain subjective well-being. In any event, their analysis faces a similar issue to that facing the GDP-based approaches: that there are no ways of untangling missing variables, nor of assessing the consequences for the choice of public polices, beyond the important result (in the Legge and Smith analysis) that social trust, as proxied by lack of corruption, appears to have a substantial impact on subjective well-being, as found in many other studies.

What can be done to increase the policy applicability of well-being analysis? Fortunately, subjective well-being can be measured at all geographies and for most or all population sub-groups. This means that the levels and distribution of well-being can be assessed at many interesting nodes of the economic, geographic and social fabrics, thereby locating places and situations where lives could be better, and clues to what might be done to improve them. The fact that individual life evaluations are the primary source for well-being measurement also opens the door for individual-level efficiency analysis of the sort suggested and applied by Binder and Broekel (2011).

How can well-being equations be used to create a work plan for how to use research and resources to improve well-being productivity? First, the coefficients in life satisfaction equations, to the extent they are reasonably applicable to local circumstances, can be used to attach shadow values for increases in the levels of each of the driving variables. The ratios of the coefficients can be used to estimate the improvement in well-being that would result from an increase in any of the supports for well-being. Where one of the coefficients in question is that for income, then it gives for the other variable a compensating differential of the sort used by Adam Smith centuries ago, and others more recently (e.g. Helliwell and Huang, 2010) to think about the values of non-pecuniary aspects of a job. Even more straight-forwardly, the coefficients on each variable provide an estimate of the increase in well-being that might accompany an increase in one of the supporting variables.

How then can these relative values be used to form a ranking among alternative ways to improve well-being? At the aggregate level, there are no clear production functions for the creation of health, social support, freedom and altruism, but this is where the detail and specificity of well-being analysis can help. Within health, there are many possibilities for rearranging the technology and delivery of health care in ways that improve the lives of patients and providers, curing illnesses while also building rather than just repairing physical and mental health. In education, researchers are increasingly applying the lessons of positive education, finding ways that still deliver the necessary 3 Rs mon-

itored by the long-standing PISA studies, while also making education a positive experience for teachers, students and families, and simultaneously creating values and life skills to support happier futures. And there is growing study of how to make for happier workplaces, for happier cities, and better mental and physical health. The 2022 Global Happiness and Well-Being Policy Report presents examples from around the world of policies designed to improve well-being in all these sectors, although in most cases the attractiveness of the policies is expressed in instrumental terms, with conventional sector-specific objectives being the currency of choice (Global Happiness Council, 2022). It has been common, especially in well-being analysis of the workplace (Cotofan *et al.*, 2021) and health, and indeed more generally (de Neve *et al*, 2013), to take an instrumental approach to subjective well-being, something to be improved because it will thereby reduce quit rates, mortality (Rosella *et al.*, 2019) hospitalizations (De Prophetis *et al.*, 2020), or health care costs (Goel *et al.*, 2018). As a strategy for introducing subjective well-being into policy discussions, this has advantages, since it offers policy makers possible ways to achieve the pre-existing objectives at a lower cost and on a more sustainable basis.

Peroni, Pettinger and Sarracino (2022) in this symposium provides another useful example of an instrumental approach, showing that both job quality and job satisfaction have positive linkages to industry-level measures of output per worker.

But making subjective well-being the objective, and not just an instrument to improve other outcomes, requires a further shift in thinking and analysis. If higher life evaluations really are the objective, then that is how the analysis should be framed, with conventional inputs and outputs mainly entering via their impacts on the net resource requirements to achieve higher well-being (e.g. Frijters *et al*, 2020, Helliwell *et al*, 2020, 2021, Layard and O'Donnell, 2015, Layard, 2021). Seen in this context, happier workplaces contribute both through their direct impacts on life evaluations and through their ability, as found by Peroni *et al.*, to improve conventional productivity measures. Equally, a sense of community belonging contributes to better lives instrumentally though improved health status (Michalski *et al.* 2020), and also more directly as a driver of overall life evaluations (Helliwell *et al.* 2019).

References

Agarwala, M., Coyle, D., Di Gennaro, V. and Ferrini, S. (2021) "The Impact of Subjective Well-being on Economic Productivity: A Sub-National Empirical Analysis in the UK," paper presented at the Virtual Workshop on *Productivity and Well-being: Measurement and Linkages* organized by the Centre for the Study of Living Standards and The Productivity Institute, November 16-17.

Binder, M., and Broekel, T. (2012) "Happiness No Matter the Cost? An Examination on How Efficiently Individuals Reach Their Happiness Levels," *Journal of Happiness Studies*, Vol. 13, No. 4, pp. 621-645.

Cotofan, M., De Neve, J. E., Golin, M., Kaats, M., and Ward, G. (2021) "Work and Well-being During COVID-19: Impact, Inequalities, Resilience, and the Future of Work," *World Happiness Report 2021*, pp. 153-190.

De Neve, J. E., Diener, E., Tay, L., and Xuereb, C. (2013) "The Objective Benefits of Subjective Well-being," *World Happiness Report 2013.*

De Prophetis, E., Goel, V., Watson, T., and Rosella, L. C. (2020) "Relationship Between Life Satisfaction and Preventable Hospitalisations: A Population-Based Cohort Study in Ontario, Canada," *BMJ open*, Vol. 10, No. 2, e032837.

Frijters, P., Clark, A. E., Krekel, C., and Layard, R. (2020) "A Happy Choice: Wellbeing as the Goal of Government," *Behavioural Public Policy*, Vol. 4, No. 2, pp. 126-165.

Global Happiness Council (2022) *Global Happiness and Well-being Policy Report 2022. New York: Sustainable Development Solutions Network*.https://s3.amazonaws.com/happinessscouncil.org/GHC_2022.pdf.

Goel, V., Rosella, L. C., Fu, L., and Alberga, A. (2018) "The Relationship Between Life Satisfaction and Healthcare Utilization: A Longitudinal Study," *American Journal of Preventive Medicine*, Vol. 55, No. 2, pp. 142-150.

Hazledine, T. (2022) "Trust, Deep Trust, Productivity and Well-being in 136 Countries," *International Productivity Monitor*, Vol. 42, pp. 142–165, Spring.http://www.csls.ca/ipm/42/IPM_42_Hazledine.pdf.

Helliwell, J. F., and Huang, H. (2010) "How's the Job? Well-being and Social Capital In the Workplace," *ILR Review*, Vol. 63, No. 2, pp. 205-227.

Helliwell, J. F., Huang, H., and Wang, S. (2015) "The Geography of World Happiness," *World Happiness Report 2015*, pp. 12-41.

Helliwell, J. F., Huang, H., and Wang, S. (2017) "The Social Foundations of World Happiness," *World Happiness Report 2017*, pp. 8-47.

Helliwell, J. F. (2021) "Measuring and Using Happiness to Support Public Policies," in *Measuring Well-Being*. Matthew T. Lee, Laura D. Kubzansky, and Tyler J. VanderWeele, (Oxford University Press)." https://oxford.universitypressscholarship.com/downloadpdf/10.1093/oso/9780197512531.001.0001/oso-9780197512531-chapter-2.pdf (Also NBER WP26529).

Helliwell, J. F., Gyarmati, D., Joyce, C., and Orpana, H. (2022) "Building an Epidemiology of Happiness," in Hayden, A., Gaudet, C., and Wilson, J. eds." *Towards Sustainable Wellbeing: Moving beyond GDP in Canada and the World*. (University of Toronto Press), pp. 223-239. (Previously NBER w28095).

Helliwell, J. F., Huang, H., Norton, M. B., and Wang, S. (2019) "Happiness at Different Ages: The Social Context Matters," in *The Economics of Happiness* pp. 455-481. Springer.

Helliwell, J. F., Shiplett, H., and Bonikowska, A. (2020) "Migration as A Test of the Happiness Set-Point Hypothesis: Evidence from Immigration to Canada and the United Kingdom," *Canadian Journal of Economics*, Vol. 53, No, 4, pp. 1618-1641.

Layard, R. (2021) "Living Long and Living Well: The WELLBY Approach," *World Happiness Report 2021* https://worldhappiness.report/ed/2021/living-long-and-living-well-the-wellby-approach/.

Layard, R., and O'Donnell, G. (2015) "How to Make Policy When Happiness is the Goal," *World Happiness Report 2015*, pp. 75-87. (New York: Columbia University).

Legge, J. and Smith C. (2022) "Well-being and Productivity: A Capital Stocks Approach," *International Productivity Monitor*, Vol. 42, pp. 117–142 Spring.http://www.csls.ca/ipm/42/IPM_42_Smith.pdf.

Michalski, C. A., Diemert, L. M., Helliwell, J. F., Goel, V., and Rosella, L. C. (2020) "Relationship Between Sense of Community Belonging and Self-Rated Health Across Life Stages," *SSM-Population Health*, 12, 100676.

Nikolova, M., and Popova, O. (2021) "Sometimes Your Best Just Ain't Good Enough: The Worldwide Evidence on Subjective Well-being Efficiency," *The BE Journal of Economic Analysis & Policy*, Vol. 21, No. 1, p. 83-114.

Nordhaus, W. D., and Tobin, J. (1973) "Is Growth Obsolete?" in *The Measurement of Economic and Social Performance* NBER. pp. 509-564.

Oulton, N. (2022) "The Link Between the Standard of Living and Productivity in the UK: A Decomposition," *International Productivity Monitor*, Vol. 42, pp. 187–211 Spring.http://www.csls.ca/ipm/42/IPM_42_Oulton.pdf.

Peroni, C., Pettinger, M., Sarracino, F. (2022) "Productivity Gains from Worker Well-Being in Europe,"*International Productivity Monitor*, Vol. 43, Fall. http://www.csls.ca/ipm/42/IPM_43_Peroni.pdf

Rosella, L. C., Fu, L., Buajitti, E., and Goel, V. (2019) "Death and Chronic Disease Risk Associated with Poor Life Satisfaction: A Population-Based Cohort Study," *American Journal of Epidemiology*, Vol. 188, No. 2, pp. 323-331.

Sarracino, F. and O'Connor, K., J. (2022) "A Measure of Well-being Efficiency Based on the World Happiness Report," *International Productivity Monitor*, Vol. 43, Fall. http://www.csls.ca/ipm/43/IPM_43_OConnor.pdf.

Stiglitz, J. E., Sen, A., and Fitoussi, J. P. (2009) "Report by The Commission on the Measurement of Economic Performance and Social Progress".