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POLICY BRIEF

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Consumption, Technology and Wellbeing[1]

Cruise ship, Brest harbor © Louise Ras, Sailing Hirondelle

SUMMARY

This policy brief highlights the insights subjective well-being metrics bring to the understanding of the relationship between consumption and happiness. We explore this topic in the advent of expected significant price increases under the double impact of higher climate volatility and the costly transition to cleaner production and transportation technologies, as it is the case with maritime transport.

People appear to be sensitive to price increases, on top of the real purchasing power of price and income changes regarding their happiness. Moreover, the type of consumption matters, with a lower marginal effect of material consumption on wellbeing compared to experiential consumption. Health, social relationships and local environment are considered as main drivers of their wellbeing and de-emphasise consumption.

A key outcome is that the gains of additional consumption decrease with the level of consumption, making consumption reductions less painful at the upper end of the revenue scale. Rich societies should be actively working on further decoupling material consumption and well-being by consciously exposing the elusive nature of the well-being boost we get from conspicuous consumption (goods others can readily observe: car, clothing, house, watches) and provide incentives for more socially and environmentally responsible modes of consumption.

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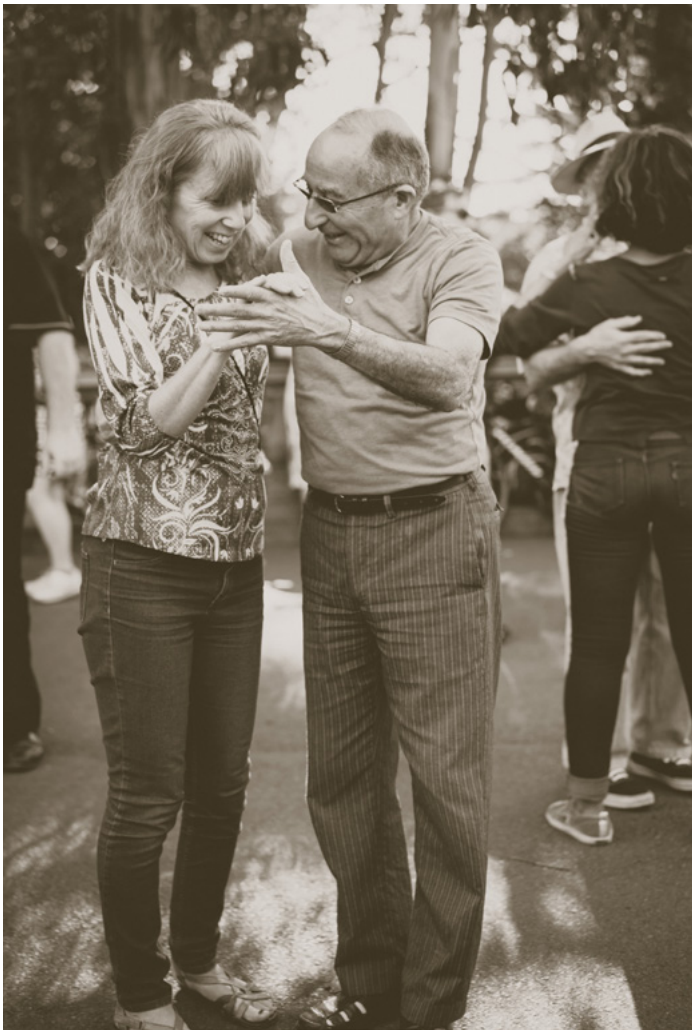
What is subjective wellbeing?

Economists' interest for the measurement of subjective wellbeing emerged in the 1950's from psychological science. Psychological scientist had devised questions which approached a common understanding of wellbeing with a sufficient level of robustness. A key such measure is life satisfaction: "On a scale from 0 to 10, how satisfied are you with your current life?", associated with evaluative well-being in the sense you have to reflexively weight all the aspects of your current life. Three other core aspects are emotional well-being ("How happy were you yesterday?"), eudemonic well-being ("How much do you feel what you do in your life has meaning, value?) and mental health ("How anxious did you feel yesterday?). Surveys have adapted these questions to assess domain-specific satisfaction, e.g., satisfaction with work or work-life balance, past and future life, or prospects for the next generation.

For economists, these questions, and the cardinal nature of the answers[2] act as a reasonable empirical approximation of the elusive utility function which is a foundation of all economic models. It allows to observe the effects of contexts or policies without arbitrary assumptions about what goods, services and circumstances are valued by people and how.

Politically speaking, these measures raised to prominence in the late 2000's, on the wave of the Global Financial Crisis and the feeling that Gross Domestic Product (GDP) growth maximization had failed as an overarching policy objective. The report from the Stiglitz-Sen-Fitoussi commission (Stiglitz *et al.*, 2009) was a landmark event in this respect, designating subjective well-being as part of the core dashboard for new measures of human progress (along with GDP and sustainability indicators). Since then, several governments and local authorities have embedded subjective well-being metrics into their policy design and evaluation. Their actions range from simple measurement (note: a measurement is not a use...) to policy budgeting (in the UK, as described in the ***Green Book***, see *Social Impacts Task Force*, 2021; HM Treasury, 2022), up to being an overarching objective of the policy agenda, as with the New Zealand Well-Being Budget (Government of New Zealand, 2020).



Dancers in Golden Gate Park © John Moeses Bauan, Unsplash

Measuring subjective wellbeing: whathave we learnt?

One core insight of subjective well-being is to throw a new light on the relation between revenue, consumption and well-being. The crux of the matter is best known as the *Easterlin Paradox* (Easterlin, 1974): while the US has experienced significant economic growth and improvement of living standards since the 1960s, the share of people saying they are happy or very happy has decreased. This paradox flies in the face of broad cross-sectional evidence that richer countries are on average more satisfied, as evidenced in data from the ***Gallup World Poll***. It also contrasts with the observation that the shorter time series available from other countries seem to evidence a positive relationship between GDP per capita and satisfaction, thus pointing to a US-specific phenomenon (Stevenson and Wolfers, 2008).

[2]*There is still a lively debate on how appropriate it is to consider answers as cardinal, for example by computing means and medians. A body of work however shows the fact that cardinality-based computations of satisfaction have a high predictive power, for example for job quits (D'Ambrosio, Clark and Barazzetta, 2018), (Kaiser and Oswald, 2022), better than a rich set of observable factors.*

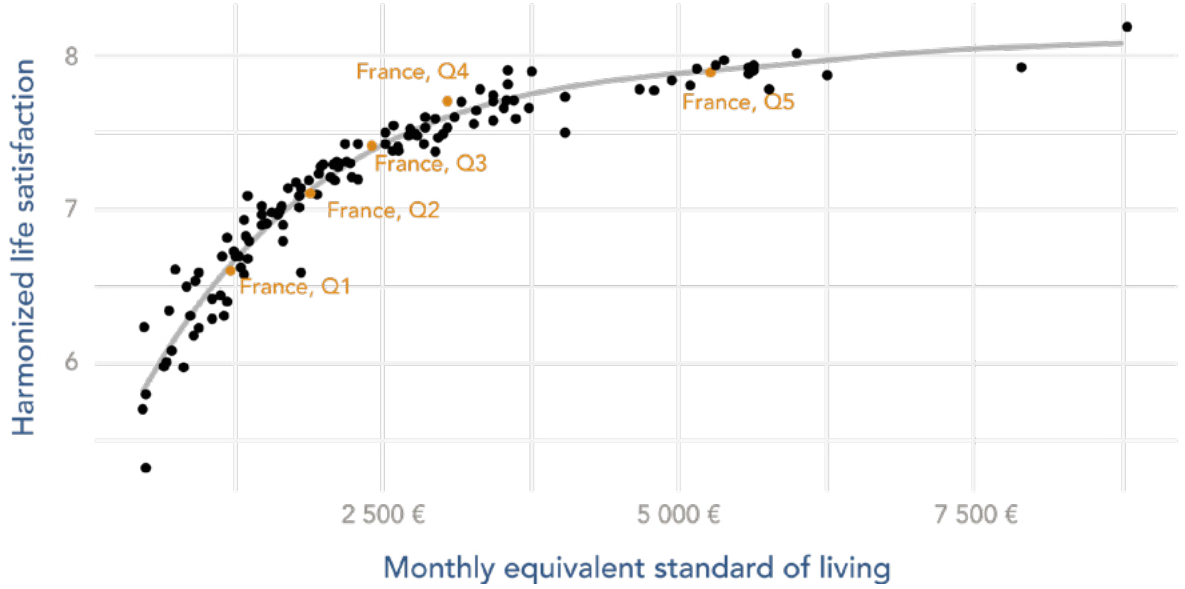


FIGURE 1. *Monthly equivalent standard of living (revenue adjusted for household composition) vs. harmonized life satisfaction from the EU-SILC survey. Each point is a country-revenue quintile average.Adapted from J-M Germain, 2020.*

More granular data has allowed many contributions to show that the relationship between household revenue and satisfaction displays the expected logarithmic shape predicted by any decreasing marginal utility function. In other words, gains in revenue provide incrementally smaller gains in satisfaction, up to the point where these gains become negligible. For the US, Kahneman and Deaton (2010) pinpoint the tipping point at around 75k$ a year for emotional well-being (happiness question). On European data, Germain (2020), from which we adapt Figure 1, shows how a threshold on life satisfaction may vary across European countries.

A variability of this threshold comes as no surprise to regular readers of the yearly ***World Happiness Report***. Using the Gallup data, that report shows that revenue is only one, albeit important, driver of life satisfaction. They show that average life satisfaction at a country level can be convincingly decomposed into components pertaining to revenue, social support, health, freedom, generosity, and perception of corruption. This decomposition is illustrated in Figure 2, on the top 20 countries with the highest average life satisfaction in the 2022 edition of the *World Happiness Report*. These indicators reflect the contribution of the collective private and public sphere to individual well-being. Their level will in turn impact the shape of the relationship between revenue and satisfaction: in a country with a reliable (low-corruption) and cheap good healthcare system, a household will require fewer personal resources to healthcare spending, thus limiting the share of expenses which do not directly provide satisfaction *per se*.

A few other stylised facts bear attention. Closely related to the satiation observation, research has shown that part of the link between revenue and satisfaction stems from a comparison effect: we are not really made happier by our shiny new car, but by the fact it is shinier and more fashionable than other cars in our neighbourhood, circle of friends or colleagues. This gives rise to what is referred to as a hedonic threadmill: we tend to increase our perceived needs and thus spending just to keep up with people we perceive as our peers. In an affluent society, this can lead to the kind of outcomes highlighted by Easterlin: an increase in consumption without any corresponding long-term satisfaction gain. On a related note, life satisfaction displays a behaviour consistent with loss and risk aversion: on average, life satisfaction responds more strongly to (unexpected) negative revenue shocks than to positive ones suggesting that smoother revenue and consumption paths may be more conductive of wellbeing.

To a large extent, most of the literature considers revenue to be a near-equivalent for consumption, in line with the view of savings as delayed consumption. Part of the reason is a data availability issue: revenue is much more common in surveys, since detailed, reliable consumption data is expensive and time-consuming to collect. Some longitudinal surveys, and ad hoc experiments provide additional insights with respect to the role of consumption itself. Longitudinal population surveys have substantiated and detailed the comparison effect (see Noll and Weick, 2015; Brown and Gathergood, 2020; Dominko and Verbič, 2022).

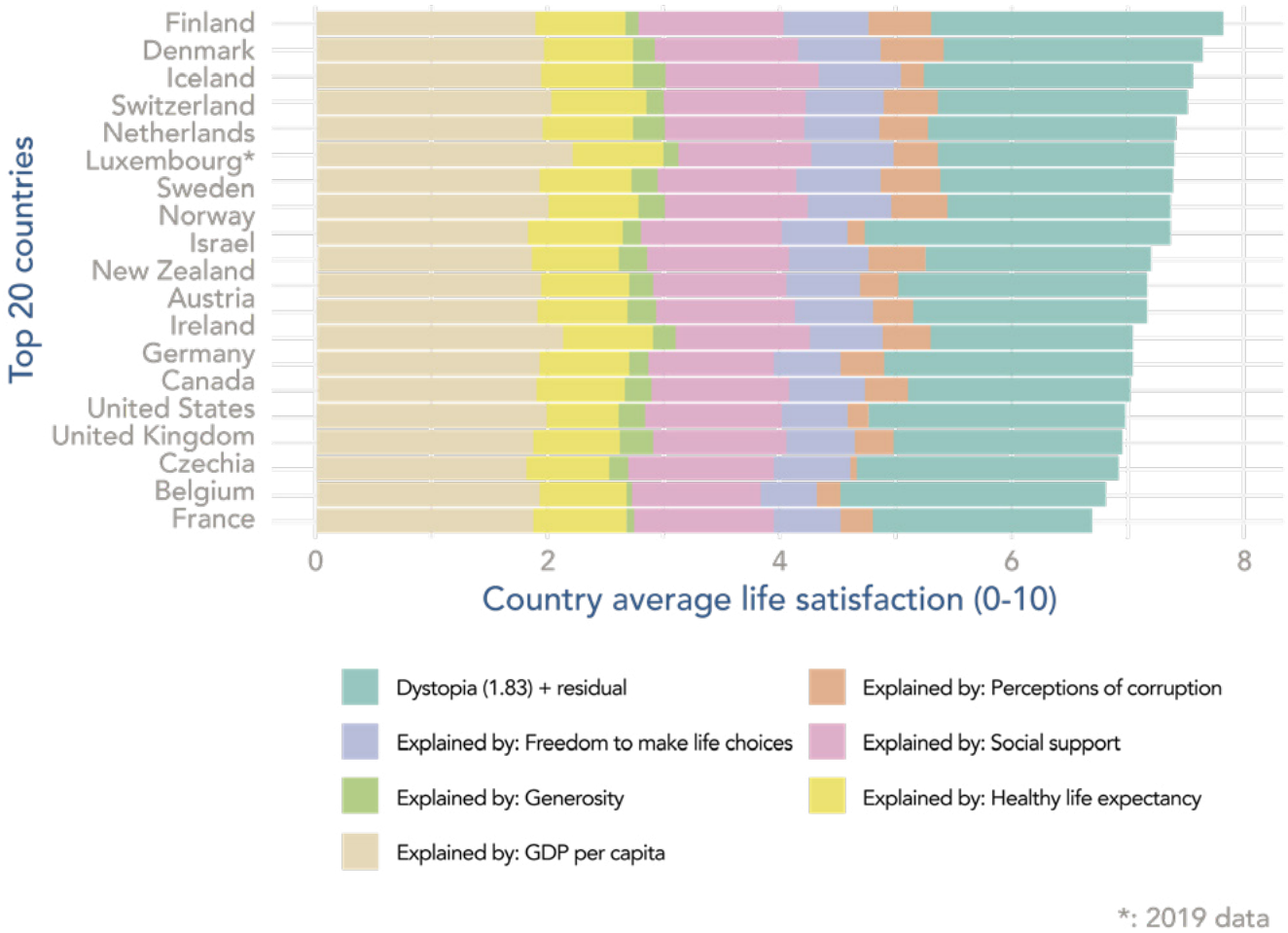


FIGURE 2. *Results of a regression of the country-average life satisfaction on a set of indicators. Dystopia here stands for a fictional country which would have the lowest score in each indicator, allowing for a positive contribution of each indicator above the minimum observed level.Source: World Happiness Report 2022.*

They consistently show that consumption does matter for life satisfaction, but the relationship is really significant for two classes of goods: on the one hand conspicuous consumption (goods others can readily observe: car, clothing, house, watches), and experiential goods (restaurant, travel, leisure, and also charity). The weight of conspicuous consumption is consistent with the comparison effect described above. The effect of leisure spending stems in part from the increased social interaction some of these allow, directly (eating out with friends) or indirectly (providing material for a conversation over a book, a visit or a movie). More experimental approaches show that experiential purchases provide more satisfaction and happiness than material purchases (see Kumar *et al.*, 2020 for a review). In practice however, it can be difficult to draw the line between the two (Weingarten *et al.*, 2022), all the more so when companies have made a large effort to brand their goods as part of an overall experience (*Apple* being a prime example). While most of the literature focuses either on life satisfaction or happiness (emotional), Tsurumi *et al.* (2021) gauges the impact of material and relational consumption (goods and services whose consumption entails substantial social elements: dinners with friends, collective sports, etc.) on several well-being dimensions. They find that relational consumption contributes to all their well-being dimensions without a measurable upper bound, while material consumption impact is limited to certain thresholds. Relational consumption also appears to have a higher marginal impact than material consumption on all well-being dimensions. Alongside consumption itself, it appears that experienced price variations have distinct, separate impact on well-being. Well-being data show that people generally prefer low nominal inflation (Di Tella *et al.*, 2001). Moreover, experienced inflation most of the time differs from measured inflation, mainly because we are more sensitive to the price of frequent purchases (*e.g.*, groceries) and less to that of less salient expenses (*e.g.*, monthly data plan). On French data, Prati

(2022) shows that the dispersion of experienced inflation explains part of the satisfaction with living standards, over and above income. As a result, increasing prices have a double negative effect of well-being, through real consumption and through experienced inflation.

Policy avenues

Recent experiences as well as credible scenarios of climate change suggest that we should expect significant price increases under the double impact of higher climate volatility and the costly transition to cleaner production and transportation technologies.

First, higher climate volatility should affect global productivity levels (food crops, among other things) and should increase prices through a supply shortage effect. Second, although cleaner production and transportation technologies are among the most popular mitigation solutions to climate change, their costs are very high, due to a lack of maturity. Considering the case of maritime transportation, cleaner technologies such as exhaust gas cleaning systems and liquefied natural gas (LNG) fuelled ships are still at the embryonic stages, thus present volatile and high investment costs (Sèbe and Recuero-Virto, 2022), although they are some of the most suitable options for shipping companies (Zis *et al.*, 2016; Endres et al., 2018). These expensive costs to cleaner maritime transportation will most likely affect consumption prices, given that 80% of the world's traded goods are carried by sea (Carrière-Swallow *et al.*, 2022).

Well-being research helps delineate some impacts of these changes in prices on wellbeing. Emphasize can be put on the relationship between revenue and satisfaction once again on the voluntary dimension of some consumption reduction patterns, and on the relevance of mental health.

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A direct consequence of the shape of the relation between revenue and satisfaction is that a uniform decrease of consumption would disproportionately impact people lower on the global and national scale. This would of course be especially true for any increase in the prices for essential goods (food, energy), which represents a much larger share of poor to medium income households, globally and nationally. Conversely, consumption reductions targeted at richer people would have a more limited impact on their life satisfaction – and possibly a positive impact of the rest of the population, through a reduced comparison effect. This can, for example, take the form of a Pigouvian taxation on consumption goods or services which have a strong impact on climate, are highly salient and highly skewed towards richer consumers.
Alongside economy-wide changes, a number of studies suggest that voluntary consumption reductions may not decrease happiness or satisfaction, and maybe increase it (Kaida and Kaida, 2016; Minton *et al.*, 2018; Schmitt *et al.*, 2018; Zannakis *et al.*, 2019; Netuveli and Watts, 2020; Welsch, 2020; Zawadzki *et al.*, 2020). These studies rely on people actively choosing to reduce their consumption of a set of goods, chiefly on environmental grounds (to reduce their impact on climate change) but also for wellbeing-motivated reasons, under the idea that over-consumption is doing them more harm than good, and that they too often regret making some purchases, or feel peer-pressured to buy without really wanting it. Due to the small scope of such experimentations, it remains to be seen if these effects would also apply at scale.

Another significant implication is that more resources should be directed towards mental health. In the UK, Clark *et al.*(2018) documented that bad mental health is a stronger contributor to low life satisfaction than material difficulties. Furthermore, the same study showed that mental health at 16 was the most significant driver of life satisfaction in adulthood. Both of these indicate there would be a very large wellbeing payoff of making mental health care more accessible and freer of its current social stigma, as well as making available an explicit mental health training for children and teenagers. In this respect, two evidenced-based programs deserve some attention. This is not restricted to rich countries: emerging and low-income countries suffer from wide-ranging mental health problems (Mnookin, 2016). Among teenagers, the ***Healthy minds*** program by Bounce Forward has been shown to increase mental health with no adverse effect on academic performance.

Among adults, a local community course, entitled *Exploring What Matters*, has been evaluated by the LSE Center for Economic Performance (Neve *et al.*, 2020), and shown to improve participants' life satisfaction and mental health. Intervention of this kind show that most participants underline health, social relationships and local environment as main drivers of their wellbeing and de-emphasise consumption. At a higher level, some researchers (Pickett and Wilkinson, 2019; Layard and Ward, 2020) advocate that rich societies should be actively working on further decoupling material consumption and well-being by consciously exposing the elusive nature of the well-being boost we get from conspicuous consumption and provide incentives for more socially and environmentally responsible modes of consumption.

Further research

In the light of the impeding price changes due to climate change adaptation and mitigation, several avenues of research appear essential to understand how these changes will impact subjective wellbeing and how to contain such prices swings.

A first area would be to better understand the full link between real consumption, the price structure and wellbeing. We saw that perceived inflation weighs on wellbeing, but we know much less about the wellbeing costs of rebalancing consumption patterns according to rapidly-changing prices. For example, an increase in transportation prices and a better pricing of the ecological impact (carbon emission, water consumption) means a large disruption in the fashion industry. Apart from the direct effect of higher prices, this could mean a full reshuffle not only in our wardrobes, but with respect to what is an acceptable attire in business environments. While there are obvious gains to clothing norms more in line with actual weather, more compatible with active transportation (e.g., cycling to business appointments) and less reliant on aggressive air conditioning, there is a switching cost in terms of wellbeing in pioneering and adapting to these new norms.

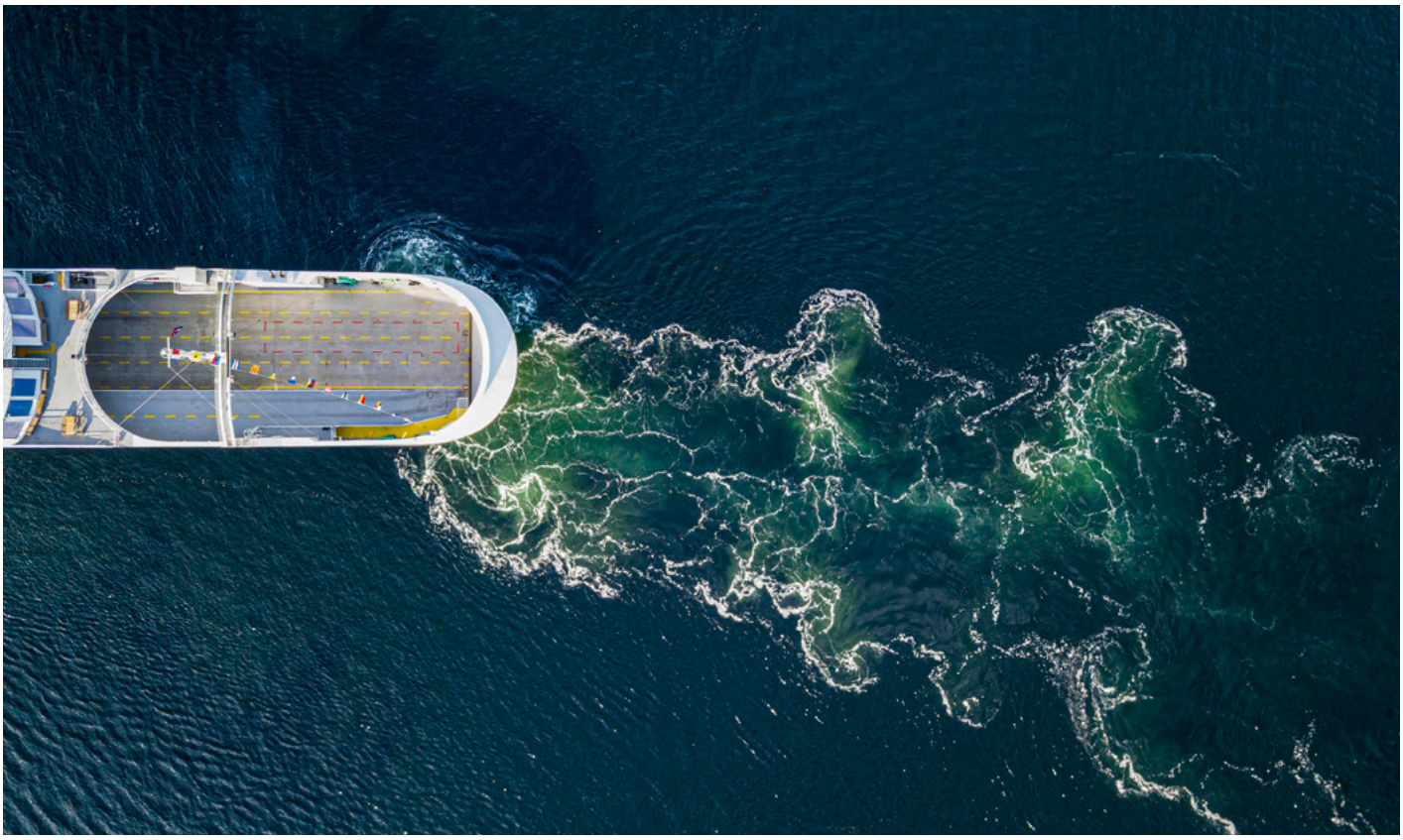
A second area focuses on the malleability of conspicuous consumption and consumption patterns. We need to know if wellbeing-informed programs, such as Exploring What Matters or voluntary consumption reduction programs do lead to sustained changes in the types of good and services consumed. A related question is whether these evolutions can contribute to informational cascades whereby other people outside the program observe the consumption evolution and change their own behaviour.

Research should also explore how we could contain the effects of climate change on consumption. The world heavily relies on new technologies to mitigate climate change, although they are costly,

and cannot guarantee that they will be mature enough to shield against significant price changes. In addition, investments are made on one or very few technologies at a time. However, scientific findings are not set in stone. Over time, research tends to point out the flaws of former technologies that were once critically acclaimed. In the case of maritime transportation, most investments to tackle greenhouse gas emissions were targeted toward LNG for many decades, until the recent discovery of "methane-slips" (methane emission from the unburned fuel). A better alternative would be to consider several technological paths to greener transition.

Furthermore, if our society focuses that much on technology, it is because technical progress is a key driver to productivity efficiency, increased global consumption, and economic growth. Nevertheless, given the limited impact of material consumption on well-being, it would be instructive to identify the impacts of greener consumption trends, to select the policies that would support such a change in consumption patterns, and to predict the likelihood of a paradigm shift in that direction. This would come as additional support to operational solutions to climate change, such as speed reduction, which is known to decrease ships' greenhouse gas emissions. A shift in the consumption paradigm could take the form, for example, of consumers being likely to accept a delayed delivery for the sake of climate sustainability.

In maritime transport, the spotlight is often on technology when it comes to solving climate change. However, the literature highlights that whatever the emerging technologies, they will not solve anything if we do not change how our society functions. As an example, the shipping industry is developing a single solution at a time to reduce gas emissions, with few regards to energy diversification and placing operational solutions at the end of the agenda. We show that the shipping industry did not learn from the liquefied natural gas environmental setbacks, and massively invests in hydrogen. This strategy, significantly funded by the European Union, is risky as it locks out other technologies. If the hydrogen fails to succeed, no other technology can take over. Meanwhile, the lack of transformation of the maritime sector continually leads to more gas emissions and raises the question of changes in current consumptions patterns.



Electric ferry in Bergen, Norway © Matjaz Krivic, Climate Visuals Countdown

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OCEAN UNIVERSITY INITIATIVE

The Ocean University Initiative was initiated by the local authorities in Brittany. It is implemented by the University of Brest (UBO) with the aim of creating the conditions for establishing in France of an institute of the United Nations University dedicated to the ocean and the coasts, and with the means to carry out pioneering work in three areas: research, training and communication.

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