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DISCUSSION PAPER SERIES

IZA DP No. 12998

Recoupling Economic and Social Prosperity

Katharina Lima de Miranda
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ABSTRACT

Recoupling Economic and Social Prosperity*

This paper explores a new theoretical and empirical approach to the assessment of human well-being, relevant to current challenges of social fragmentation in the presence of globalization and technological advance. We present two indexes of well-being – solidarity (S) and agency (A) – to be considered alongside the standard indexes of material gain (G) and environmental sustainability (E). The four indexes – SAGE – form a balanced dashboard for evaluating well-being. The solidarity index covers the needs of humans as social creatures, living in societies that generate a sense of social belonging. The agency index involves people's need to influence their fate through their own efforts. While "economic prosperity" (material gain) is conventionally measured through GDP per capita, "social prosperity" can be measured through our solidarity and agency indexes, alongside environmental sustainability that is measured through the Environmental Performance Index. The SAGE dashboard is meant to provide a "sage" approach to assessing well-being, since it aims to denote sagacity in the pursuit and satisfaction of fundamental human needs and purposes. Many of the prominent challenges of the twenty-first century, including the dissatisfaction of population groups who feel left behind by globalization and technological advance, may be viewed in terms of a "decoupling" of economic prosperity from social prosperity. We present a theoretical model that provides a new perspective on the welfare effects of globalization and automation. The dashboard is meant to provide an empirical basis for mobilizing action in government, business and civil society to promote a recoupling of economic and social prosperity.

JEL Classification: I31, O11, D63, D91, A13, B55, F01, F60, H11

Keywords: Beyond GDP, inequality, empowerment, social cohesion, social inclusion, social solidarity, social sustainability, well-being

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1 Introduction

This paper explores a new theoretical and empirical approach to the assessment of human well-being, relevant to current challenges of social fragmentation in the presence of globalization and technological advance. The central conceptual insights of our analysis rest on three claims: (1) Human well-being is about more than satisfying preferences for the consumption of goods and services. It also includes the pursuit and satisfaction of fundamental human needs and value-driven purposes. (2) Since the success of *Homo sapiens* is built largely on cooperation and niche construction, humans have evolved motives to socialize (particularly in groups of limited size) and to use their capacities to shape their environment. (3) Consequently, social solidarity and personal agency have become fundamental sources of human well-being. These insights have been given insufficient attention in the current literature on well-being, social welfare, and happiness.

On this basis, we present two indexes of well-being, "solidarity" (S) and "agency" (A), to be considered alongside the standard indexes of material gain (G) and environmental sustainability (E). The latter two measures are well-known and will receive no further elaboration here. The most popular index of material gain is GDP per capita, though the inadequacies[1] of this index are well-known. It is commonly supplemented by indexes of income inequality (measured by Gini coefficients) and poverty (usually defined relative to median income). Popular measures of environmental sustainability, such as the Environmental Performance Index,[2] serve the purpose of "protecting the sources of raw materials used for human needs and ensuring that the sinks for human wastes are not exceeded, in order to prevent harm to humans" (Goodland 1995, p.3).[3]

Our *solidarity index (S)* covers the needs of humans as social creatures, living in societies that generate a sense of social belonging. With respect to social belonging, "solidarity" may be considered synonymous with "social cohesion" and "social inclusion." Our *agency index (A)* involves empowerment; it covers people's need to influence their fate through their own efforts. This includes mastery of the environment, personal growth, and attainment of personal goals.

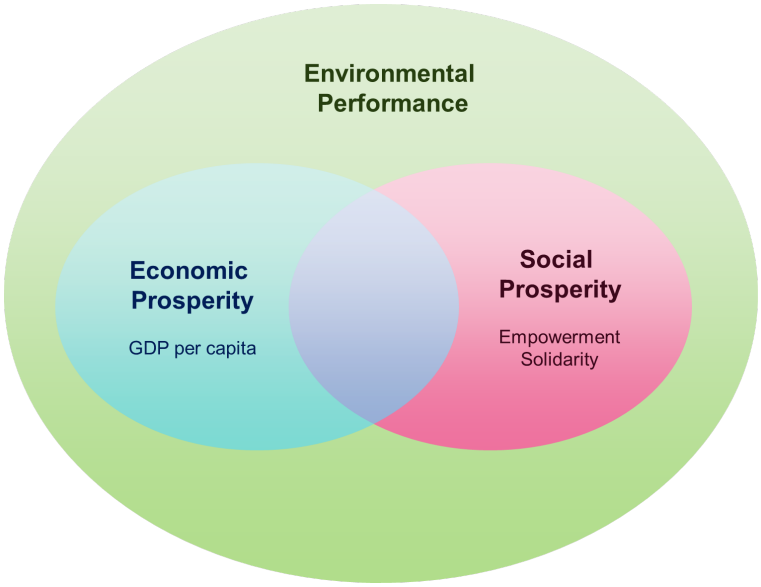
The four indexes—SAGE (solidarity, agency, material gain, and environmental sustainability)—are meant to embody a "sage" approach to assessing human well-being, aiming to denote a wide-ranging sagacity in the pursuit and satisfaction of fundamental human needs and purposes. These indexes are illustrated in figure 1. The economy and society are embedded in the natural environment. The circle denoting "economic prosperity" (measured by GDP per capita) and the circle denoting "social prosperity" (measured by our solidarity and agency/empowerment indexes) are to be found within the circle denoting "environmental performance." In well-functioning socioeconomic systems, the economic-prosperity circle largely overlaps with the social-prosperity circle—i.e., the incentives, motives, and attitudes (including trust, social support, economic security, and so on) that people need to conduct economic transactions to promote well-being are the ones that promote solidarity and agency

[1] For example, it measures material throughput regardless of whether it contributes positively or negatively to human welfare.

[2] Hsu, et al. (2016).

[3] The OECD Environmental Strategy for the First Decade of the 21st Century (OECD 2001) specifies four criteria for environmental sustainability: regeneration (sustainable use of renewable resources), substitutability (use of nonrenewable resources to be offsetable by renewable resources or other forms of capital), assimilation (pollution to remain within the assimilative capacity of the environment), and avoiding irreversibility.

Figure 1: The relation among the four indexes



in their society. For an economy that grows (in terms of GDP per capita) while its citizens are mired in dissatisfaction and conflict, the economic-prosperity circle becomes decoupled from the social-prosperity circle. For an economy whose growth is becoming increasingly unsustainable, the economic-prosperity circle is growing while the environmental-performance circle is shrinking.

We claim that many of the prominent challenges of the twenty first century—including climate change, environmental degradation, social fragmentation, stagnating subjective well-being, and "deaths of despair" in the United States[4]—arise from a "decoupling" of economic prosperity (measured in terms of GDP) from social prosperity (in terms of people's well-being in their communities). The persistence of national, ethnic, and religious conflicts around the world, combined with rising dissatisfaction among large population groups that feel "left behind" in both the developed and developing countries attests to such decoupling for significant segments of modern societies. Tackling the major challenges of our times will involve confronting the paradox of growing aggregate output in an increasingly integrated global economy, accompanied by ongoing social tensions in a persistently fragmented global community. Our indexes of solidarity and agency, alongside indexes of economic prosperity and environmental sustainability, aim to shed light on the decoupling processes in disparate parts of the world and provide an empirical basis for mobilizing action in government, business, and civil society to promote a recoupling of economic and social prosperity.

We will argue that solidarity (S) and agency (A)—alongside material gain (G) and environmental sustainability (E)—cover fundamental human needs and purposes, present in all cultures. When people's important material needs have been met, when they feel securely and meaningfully embedded in society, when they have the power to influence their circumstances in accordance with self-determined goals, and when they live respectfully of planetary boundaries, then they achieve a wider sense of human well-being than when they simply maximize GDP growth. Failure to achieve any of these ends is associated with suffering. The

[4]Case and Deaton (2020).

inability to meet basic material needs signifies extreme poverty; lack of agency signifies a lack of freedom, empowerment, self-expression, and self-determination; failure to achieve social solidarity is associated with loneliness and alienation; and living unsustainably means robbing future generations (as well as others in the current generation) of the opportunity to lead flourishing lives.

The four goals—SAGE—are not consistently substitutable for one another. The gains from solidarity and agency generally cannot be translated into temporally invariant monetary terms whereby material gain is measured. In order to thrive, people need to satisfy all four purposes—their basic material needs and wants, their aim for social embeddedness, their desire to influence their destiny through their own efforts, and their need to remain within planetary boundaries. Agency is valueless when one is starving; consumption has limited value when one is in solitary confinement; and so on. Furthermore, the gains from solidarity, agency, material gain, and environmental sustainability are different in kind and thus not readily commensurable.

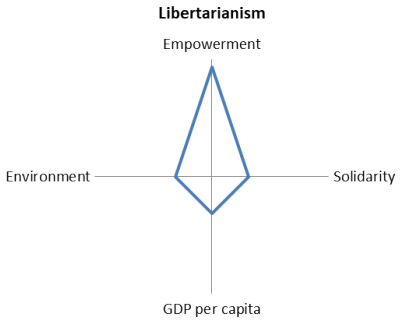
Our SAGE indexes may thus be understood as a dashboard. Just as the dashboard of an airplane measures magnitudes (altitude, speed, direction, fuel supply, etc.) that are not substitutable for one another (e.g., correct altitude is not substitutable for deficient fuel), so our four indexes are meant to represent separate goals. When a society makes progress with respect to all four SAGE goals, there can be some grounds for confidence that a broad array of basic human needs and purposes is being progressively met.

Figure 2 clarifies the underlying concepts by depicting various stylized special cases.[5] "Libertarianism"—in figure 2a—emphasizes agency (empowerment), possibly at the expense of the other goals (communitarian belonging and environmental sustainability may be neglected, and even GDP per person may receive inadequate emphasis when public goods cannot be procured through unfettered individualistic activity). "Neoliberalism"—in figure 2b—promotes both agency (empowerment) and economic prosperity generated in free markets (often at the expense of communitarian and environmental goals). "Despotic communitarianism" (exhibited by some communist movements)—in figure 2c—emphasizes solidarity alone (often at the expense of empowerment and environmental sustainability). "Eco-solidarity" (as exemplified by FridaysForFuture)—figure 2d—is focused on communities that aim to protect the environment, possibly at the expense of economic prosperity and empowerment. What we have termed "liberal communitarianism"—in figure 2e—promotes a liberal approach to economics and politics to promote both agency (empowerment) and economic prosperity, while simultaneously advancing people's sense of belonging in their communities (possibly at the expense of environmental sustainability). Finally, under the heading of "liberal eco-communitarianism"—in figure 2f—we have depicted an approach that combines liberal communitarianism with regard for our planetary boundaries. These special cases provide visual bearings whereby the empirical results below may be interpreted.

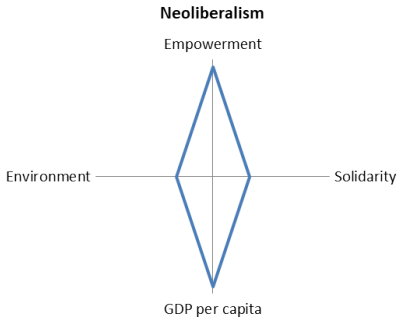
We claim that the SAGE indexes are all relevant to the current challenges arising from globalization and technological advance. Over the past four decades, these forces have generated significant growth of gross world product, but also been accompanied by rising inequality, climate change, a rising sense of disempowerment, and social alienation among various population groups (such as many inhabitants of America's rust belt and Britain's small towns,

[5]Needless to say, these characterizations are extremely simplified portrayals of underlying social and political movements. Their purpose is to shed light on the potential applicability of our dashboard.

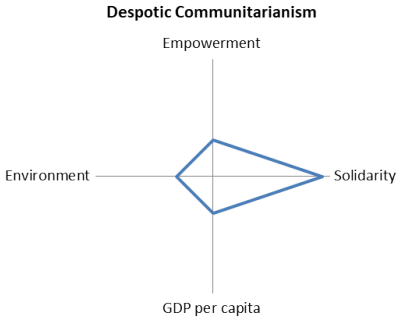
Figure 2: The Recoupling Dashboard



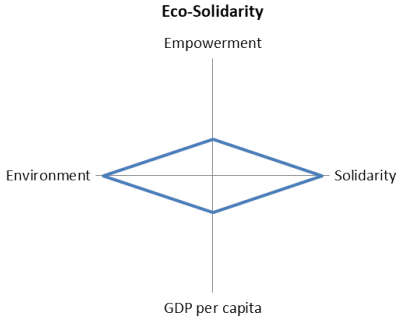
(a) Libertarianism



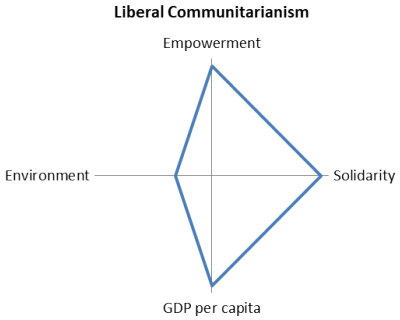
(b) Neoliberalism



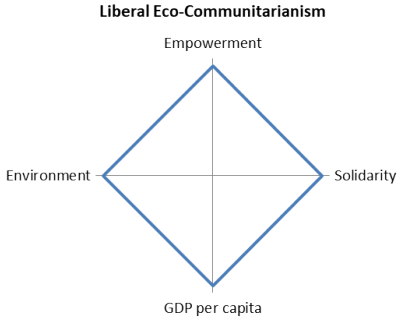
(c) Despotic Communitarianism



(d) Eco-Solidarity



(e) Liberal Communitarianism



(f) Liberal Eco-Communitarianism

as well as many of Africa's unemployed youth). The rise of populism, growing nationalism, backlash against globalization and multilateralism, and growing tolerance of authoritarianism may be symptoms of the decoupling of social prosperity—in terms of solidarity and agency—from economic prosperity.[6] Our solidarity and agency indexes help examine this role.

These contrasting developments are understandable in the light of how globalization and technological advances have developed over the past two decades. Globalization has manifested itself primarily through the proliferation of global supply chains, in which multina-

[6]Needless to say, populism, nationalism, authoritarianism, and anti-globalism are complex phenomena arising from many social, economic, and political sources. These phenomena cannot be attributed solely to deficient solidarity and empowerment, though the latter often have a role to play.

tional enterprises are able to shift production flexibly across geographic regions in response to changes in wages, productivity, and business conditions. Thus people working in one geographic region (for example, car manufacturing centers such as Detroit or Dagenham) find themselves in competition with their counterparts in distant parts of the world (such as Tokyo) of which they have no knowledge. Under these circumstances, the sudden loss of jobs in response to shifts in global supply chains is often experienced as profoundly disempowering, since it is no longer clear how people are able to secure their jobs and future career paths through their own efforts. The associated collapse of local communities, such as those built around traditional manufacturing plants, leads to the breakup of social ties (as described, for example, in Putnam [2016]). The rise of automation and the accompanying shift of routine jobs from people to machines generate a similar sense of disempowerment and alienation.

Thus, in light of the ways in which globalization and technological advance in the new digital age are proceeding, aggregate economic prosperity, social solidarity and personal agency are not closely associated with one another. This disconnect is relevant to the recent rise of nationalism and populism. When economic growth primarily benefits people at the top of the income distribution and is accompanied by reduced social and economic mobility, then it is not surprising that people at the middle and lower reaches of the income distribution should feel disempowered and socially alienated. Under these circumstances, the politics of the right wing versus the left wing (focusing on the choice between economic efficiency versus equity, understandable for empowered people living in a cohesive society) can be expected to give way to the politics of openness (free trade and cosmopolitanism) versus closedness (protectionism and nationalism). Furthermore, it is also understandable that the disadvantaged groups become favorably disposed to populist politicians who promise to "take back control" from the "detached elites" (in effect promising renewed agency/empowerment) and to "build a wall" against immigrants (thereby promising the restoration of traditional communities).

In this context, it is useful to assemble data sets on solidarity agency/empowerment, to be considered alongside the conventional data on economic prosperity and environmental performance. Our empirical assessment of solidarity and agency is meant to be only a beginning, not the end, of a journey to gain a better understanding of the relation between economic prosperity and social well-being. Our data are illustrative, rather than comprehensive, measures of social prosperity. They are meant as an invitation for more research. These data can serve as a step towards educating and mobilizing decision-makers in government, business, and civil society to action to achieve progress with regard to all four goals, encouraging further research on how such progress is to be achieved, and developing monitoring frameworks to achieve a more balanced approach to the promotion of human well-being.

This paper is addressed to two separate audiences: (1) policymakers and business leaders, who may be expected to focus on our empirical SAGE indexes and (2) academic economists, who may be interested in incorporating our notions of solidarity agency into rigorous economic analysis and understanding our indexes in this light. While both groups may wish to consider the next section, on "Underlying Issues," the first group may concentrate on the empirical section "Solidarity and Agency/Empowerment Indexes," whereas the second group may examine the section "Illustrative Theoretical Model" before proceeding to the empirical section.

This paper is structured as follows. Section 2 deals with underlying issues for our analysis of solidarity and agency. Section 3 provides a simple theoretical model that is meant to illustrate how orthodox economic analysis, focused on economic prosperity, needs to be extended

in order to take account of solidarity and agency as well.[7] Section 4 presents our SAGE indexes, in order to permit some preliminary intertemporal and cross-country comparisons. Finally, section 5 concludes the paper.

2 Underlying Issues

We begin by considering three important issues underlying our analysis. First, we examine why solidarity and agency may be considered fundamental aspects of human well-being, separate from economic prosperity. Second, we explain why solidarity and agency cannot be adequately captured through analyses of inequality. Third, we relate our indexes to existing measures of well-being.

2.1 Solidarity and Agency as Components of Well-Being

Our sense of well-being arises from the process of natural and artificial selection. Natural selection occurs through our interactions with our natural environment. Artificial selection takes place when humans are engaged in "niche construction,"[8] shaping their environment to suit their purposes. The process of selection takes place at multiple levels, from the individual to social groups. Humans are social creatures, which means that they often cooperate in groups to achieve their ends. Their cooperative motives induce them to work in groups, which can become functional groups of organization. These groups may in turn cooperate with one another to create a functional group of organization at a higher level of aggregation. Our index of solidarity is meant to capture human cooperation in this multilevel sense.[9]

While selection at various levels—from individuals to groups—deals with what biologists call "ultimate causes" shaping the properties of organisms in their interaction with their environment, human psychological motives are "proximate causes." These motives[10] are forces that give direction and energy to one's behavior, thereby determining the objective of the behavior, as well as its intensity and persistence (see Elliot and Covington, 2001; following Atkinson, 1964). Cooperative motives—including care (seeking to promote the well-being of others) and affiliation (seeking belonging within social groups)[11] - drive people to seek social belonging and generate their sense of solidarity.

Acting in accordance with these motives extends far beyond what economists call the satisfaction of individual preferences, because these motives can be associated with people's sense of purpose, giving meaning to their lives. People's cooperative purposes are associated with moral values. In the value circumplex of Schwartz (1994), for example, these values include universalism, benevolence, and conformity. Our conception of well-being includes

[7]For brevity and simplicity, this model does not describe the interaction between economic activity and the environment, as done in conventional environmental economic models.

[8]See, for example, Kendal et al. (2011) and Laland et al. (2001).

[9]For an outstanding recent explanation of human multilevel selection, see Wilson (2019).

[10]For an excellent overview, see H. Heckhausen (1989) and J. Heckhausen (2000). Bosworth, Singer, and Snower (2016) provide an analysis of motives in economic decisions.

[11]The caring motive is concerned with nurturance, compassion, and care-giving, e.g., Weinberger et al., (2010). The affiliation motive is concerned with belonging, e.g., McDougall (1932), Murray (1938), and McAdams (1980).

not just the satisfaction of tastes and appetites through consumption, but also the pursuit of purposes and values, driven by motives.

Whereas humans cooperate in groups under some circumstances, they act as individuals in others. The motives operative for individualistic activity include achievement (seeking to attain predetermined, often socially accepted, goals)[12] and status-seeking (seeking social standing and social influence)[13] and self-interested wanting.[14] These motives are also associated with value-driven purposes. In the Schwartz (1994) circumplex, the relevant values include power, achievement, hedonism, and self-direction.

Whereas the pursuit and satisfaction of cooperative purposes generates well-being from solidarity, the pursuit and satisfaction of individualistic purposes, including individual purposes in social settings, gives rise to well-being from agency, as well as well-being from economic prosperity. These considerations—including but also lying far beyond the scope of the individualistic utility maximization of orthodox economic theory—help rationalize our choice of solidarity and agency/empowerment indexes.

Solidarity and agency are specified with regard to particular reference groups. Solidarity may be directed "inwardly" to one's national, religious, ethnic, racial, or class groups, or "outwardly" to groups with regard to which one does not define one's social identity. Inward solidarity by itself may promote the well-being of one's in-group members, but it may lead to conflict with out-groups, and this conflict generally detracts from the well-being of both in- and out-group members. In other words, inward solidarity generates positive externalities for in-group members, but negative externalties for out-group members. Populism, for example, represents a form of inward solidarity that often generates hostility to immigrants, from which social conflicts within nations can arise. However, inward solidarity may also be associated with outward solidarity—as when people with a strong sense of national identity welcome immigrants and benefit from the resulting cultural exchange—generating positive externalities and promoting the well-being of in- and out-group members alike.[15] Inward solidarity is commonly understood as a precondition for outward solidarity—that is, a strong sense of social identity is necessary for openness to strangers.[16] Our empirical definition of solidarity (below) includes both "inward" and "outward" aspects of solidarity.

Agency also has "inward" and "outward" forms. Inward agency may manifest itself as the exercise of power that limits the opportunities of others. Predatory monopolies and military confrontations are examples of such empowerment. However, inward agency can be associated with outward agency—as when people become empowered by helping others achieve their goals—thereby enhancing one's own and others' well-being. Our empirical definition of agency (below) covers both the "inward" and "outward" aspects.

[12]See, for example, Atkinson and Feather (1966); Pang (2010).

[13]A discussion is included in H. Heckhausen (1989) and J. Heckhausen (2000).

[14]This motive is related to the self-interested, individualistic preferences of mainstream neoclassical utility theory.

[15]This concept of solidarity is closely related to the Judeo-Christian concept of "love your neighbor" and "love the stranger," as well as the Buddhist concept of compassion.

[16]Appiah (2018) contains many insightful examples.

2.2 The Role of Inequality

In the current economic literature, the ills associated with globalization and technological advance are commonly alleged to arise from the resulting inequality of income and wealth.[17] Thereby both the advantages and disadvantages of these global forces have been attributed to economic prosperity, with the former focused on aggregate income and wealth and the latter focused on distribution. Recent explanations of nationalism and populism concentrate on inequality versus "culture."[18]

Various reasons have been given why inequality should be considered a component of well-being. In the realm of behavioral economics and social psychology, it has been suggested that one's well-being is constructed by comparing one's own wealth to that of others. According to Fehr and Schmidt (1999), people are portrayed as having "inequity aversion," in the sense that they feel "envy" when their income is less than others in their reference group (reducing their well-being) and feel "guilt" when their income is greater than the others (also reducing their well-being). In this framework, there is no room for people feeling pride when they are doing relatively well and aspiration when others are doing better. In line with the theories of relative deprivation, social comparisons, and reference groups, people feel poor when their counterparts get relatively richer.[19] Other authors have indicated that countries with relatively high inequality tend to have relatively high rates of homicide, mental illness, social distrust, substance abuse, infant mortality, and other ills.[20] There is also a sizeable literature suggesting that inequality stifles economic growth.[21]

But there is also evidence pointing in different directions. In a large-scale empirical study of 68 societies over three decades, Kelley and Evans (2017) show that in developing countries, more unequal societies tend to be happier ones, since inequalities are seen to represent opportunities that give hope to the less well-off. In these societies, inequality is associated with opportunities for upward mobility. In developed countries, inequality is shown to have little if any bearing on happiness. In another study, Starmans, Sheskin, and Bloom (2017) found that people prefer unequal distributions to equal ones, both with regard to other lab participants and among their fellow citizens, provided that the allocation of wealth is perceived to be fair.

Furthermore, it has been argued that inequality is not necessarily destructive of people's value-driven purposes. For example, Frankfurt (2015) argues that inequality per se is not morally significant. It is difficult to see why people who lead long, healthy, joyful, meaningful, and stimulating lives should be morally justified to feel aggrieved because others are doing even better. According to this line of reasoning, whereas poverty (the absence of economic prosperity) is morally objectionable, inequality alone is not.[22]

[17] Particularly prominent examples are Piketty (2014) and Milanovic (2016). Furthermore, inequality has recently risen more within countries than between them; for example, Roser (2013) and Goda and Garcia (2017). Nevertheless inequality between countries is still vastly higher between countries than within countries. Consequently, there is a strong incentive for migration, for example, from Africa to Europe and from Central America to the United States. Our concept of solidarity as a fundamental source of human well-being is clearly relevant to this phenomenon, since solidarity may be defined inclusively or exclusively of migrants.

[18] See, for example, Rodrik (2019).

[19] For a review, see Kelley and Evans (2017).

[20] For example, Wilkinson and Pickett (2009). Such considerations, as well as misuse of market power, also underlie the analysis of Piketty (2014).

[21] See, for example, Boushey (2019).

[22] See also McCloskey (2014).

In sum, inequality should not be viewed as an unambiguous detractor from well-being. Rather, the welfare consequences of inequality depend crucially on how the inequality is generated. With the help of the indexes presented here, future research can explore the degree to which the disadvantageous or advantageous welfare consequences of inequality depend on the absence or presence (respectively) of solidarity and agency.

2.3 Relation to the Existing Literature on Well-Being

Much of the existing literature on measures that adjust or supplement GDP is tied closely to the notion of "the greatest happiness of the greatest number"—that is Benthamite utility maximization, whereby social welfare is simply the sum of individual utilities. Maximizing utilities is an exercise in satisfying "preferences," which are the rankings that an individual gives to specified alternatives based on their relative utility to the individual. Preferences are derived entirely from people's choices. In these rankings, no distinction is made between the taste for chocolate ice cream, the need for aviation security, and the injunction against killing. Such preferences are far removed from the pursuit of value-driven purposes, along the lines described above.[23]

This is true of the various GDP adjustments, such as the Measure of Economic Welfare, Index of Sustainable Economic Welfare, Green GDP, and Genuine Savings. The individualistic, preference-satisfying basis for evaluating well-being is also apparent in the approach that supplements GDP with environmental and social indicators, such as the System of Economic Environmental Accounts (SEEA), and Sustainable Development Indicators. Even indicators that aim to assess well-being independently of GDP by measuring the achievement of basic human capacities, such as the Human Development Index, have individualistic, preference-satisfying foundations.

The psychological measures of subjective well-being, such as the various happiness indicators, including the Happy Life Years Index and the Personal Well-being Index, also view well-being as the sum of individual components, without regard to human purposes.

Exceptions to the individualistic focus comprise the various social indicators constructed by sociologists, such as the Physical Quality-of-Life Index and the Index of Social Progress. These indicators, however, are not based on value-driven purposes within a multilevel selection framework and are not brought into relation with the economic indicators of well-being..

The Sustainable Development Goals (SDGs) describe a broad set of economic, social, and environmental objectives to be achieved by 2030. They are thus clearly meant to be relevant to well-being, but the connection between the SDGs and well-being has not been made explicit. The SDG Index and Dashboards[24] cannot readily be interpreted as welfare indicators, since the SDGs are a mixture of policy ends (such as SDG 1: ending extreme poverty) and policy means (such as SDG 17: global partnerships for development), the SDGs have not been weighted or prioritized with regard to overarching welfare criteria, and the substitutabilities and complementarities among the SDGs remain largely unclear.[25]

[23]Overviews of the adequacy of GDP and its proxies include, for example, Afsa et al. (2008), Bleys (2009), Boarini et al. (2006), Costanza et al. (2009), Diener and Suh (1997), Goossens et al. (2007).

[24]See Schmidt-Traub et al. (2017) and Sachs et al. (2016).

[25]Some progress has, however, been made in investigating tradeoffs among the SDGs—e.g., Machingura and Lally (2017).

The OECD Better Life Index (BLI)[26] is an interactive tool that permits users to compare countries' performances according to their own preferences regarding what constitutes a better life, taken from a list of specified "topics" (such as housing, income, jobs, community, education, environment, and so on). Thus the BLI can be interpreted as objective potential components of well-being that are to be ranked in accordance with people's preferences. It is unclear whether the users of this interactive tool invariably align their preferences to their tastes or value-driven purposes.

In short, none of the indicators above is closely related to the pursuit of human purposes through the engine of psychological motives.

3 Illustrative Theoretical Model

We now present a simple theoretical model that is meant to illustrate how conventional models of economic decision-making can be extended to include solidarity and agency, and how the extended framework sheds light on current problems generated by globalization and technological advance. Our analysis is meant to answer the following questions:

- Why are the concepts of solidarity and agency relevant to economic decision-making and to the resulting assessment of well-being? In other words, what are the economic causes and consequences of empowerment and solidarity?

- How can the concepts of solidarity and agency be incorporated into models of economic decision-making and into the assessment of well-being? Thus far these concepts have played virtually no role in neoclassical economics and, apart from analyses of "social preferences," only a peripheral role in behavioral economics.

- Why do we require a dashboard of SAGE indexes, rather than a single well-being index? We show that our dashboard covers four separate goals that cannot be indefinitely traded off against one another. Thus it becomes important to examine the degree to which each of the goals is satisfied.

- What are illustrative channels whereby the pursuit and satisfaction of the goals in our dashboard affect decisions and well-being? Our dashboard approach to well-being stands in sharp contrast to our analysis of economic decisions, which can be portrayed as the pursuit of specific decision objectives. In fact, a person's decision objective—which takes account of the tradeoffs among all the goals—is "revealed" through her decisions—that is, the tradeoff among the goals is implicit in the decision that has been made. We argue that, analogous to the distinction between decision utility and experienced utility in behavioral economics, decision objectives differ from the assessment of well-being. In particular, well-being depends (among other things) on a balance among the goals, and this balance is often overlooked in the decision objectives.

- What are the implications of solidarity and agency for our understanding of how the current forces of globalization and automation affect decisions and well-being? For the highly educated and skilled people, we show why the benefits of globalization and

[26] See OECD (2019a, 2019b).

automation fall more on their returns from work and agency than on their returns from social solidarity. This induces these people to spend more time on the former returns and less on the latter. This withdrawal of solidarity has adverse consequences for the well-being of other people, skilled and unskilled alike. For the less educated and low-skilled people, the returns from work and agency remain stagnant, and thus they experience only the adverse consequences of the fall in solidarity, without the beneficial consequences of higher productivity. Furthermore, we indicate that these developments may lead the high-skilled people to devote more attention to economic prosperity as source of esteem, while low-skilled people fall back on solidarity based on nationalism or other group affiliations as source of esteem. We show that these changes in people's objectives may reinforce social divisions, with adverse effects on well-being.

In conventional neoclassical analysis, utility maximization explains both economic decisions and well-being, since it is assumed that economic decisions are made so as to maximize well-being. The source of utility is the consumption of goods and services. On this account, a person's well-being is "revealed" through her consumption decisions, in accordance with the axioms of revealed preference theory. Preferences are assumed to be independent of the social context. In this analysis, environmental sustainability is relevant only because environmental constraints influence the amount of goods and services that can be produced and thus consumed. Behavioral economics distinguishes between decision utility (whose maximization explains decisions) and experienced utility (whose maximization explains welfare). The sources of utility are still centered on consumption, and preferences are defined relative to cognitive reference points (such as the status quo).

Our account of economic decisions, by contrast, extends this framework in three directions. First, well-being depends not just on consumption, but also on solidarity and agency. Second, well-being arises not just from the satisfaction of tastes, but from psychological motives that can also be generated by value-driven purposes. The pursuit and satisfaction of these purposes is an important source of well-being, supplementing the utility-based well-being from consumption. Third, the pursuit of solidarity, agency and consumption is recognized to depend on the social context. Although solidarity, agency and consumption-generating economic prosperity can all be considered fundamental human goals, different social norms and values may induce people to pursue these goals with different intensities. The social norms and values, in turn, arise from people's decisions that are made in pursuit of these goals. In this context, environmental sustainability is important because it permits the continued pursuit and satisfaction of these goals.

The analysis below will focus on an individual's decisions in pursuit of solidarity, agency and consumption and provide an account of the resulting well-being. The inclusion of solidarity in the individual's decision objectives and well-being means, however, that individuals may participate in each other's decisions and well-being. The more pronounced this participation becomes, the less appropriate it is to conceive of the individual as decision-making agent and as locus of well-being. However, an investigation of social groups as agents and well-being recipients lies beyond the scope of this paper. Our aim in this section is merely to provide a microeconomic framework within which the positive and normative significance of our solidarity and agency indexes can be understood. Our analysis also indicates why the goals of solidarity and agency cannot be adequately covered through the traditional economic focus on GDP and inequality.

3.1 Conventional Model

We begin with a stripped-down conventional model in which an individual i gains utility from consumption alone. The individual provides work effort e_i that generates output and income y_i, which is entirely spent on consumption.

Let the individual's production function be

$$y_i = \alpha \left(e_i + u_i \right), \tag{1}$$

where u_i is a random productivity variable, so that output is the result of both both effort and good or bad "luck." We call the parameter α is the "effort return coefficient," since it indicates the degree to which the individual's effort (along with the random productivity component) affects her income. The random productivity variable u_i is assumed to be uniformly distributed over the interval $[-\frac{\delta}{2}, \frac{\delta}{2}]$, where δ is a positive constant.

The individual's decision utility[27] from consumption and effort is

$$U_i^c = Ay_i - \frac{1}{2}e_i^2, \tag{2}$$

where the superscript c stands for "consumption," A is a positive constant, and the disutility of a unit of effort is normalized to unity.

Substituting the production function (1) into the utility function (2) and maximizing with respect to effort, we obtain the utility-maximizing effort level:

$$e_i^c = A\alpha. \tag{3}$$

This equation represents the standard condition that the effort input is such that marginal utility of consumption with respect to effort is equal to the marginal disutility of effort.

3.2 Solidarity

We now include social solidarity in our analysis. We interpret solidarity – contributing to, being affiliated with, esteemed by, and supported by one's social group—as a public good, accruing to all members of the social group. Solidarity may be considered a value-driven purpose. As noted, it is related to the values of universalism, benevolence, and conformity in Schwartz's value circumplex.

Let q_i be individual i's contribution to this public good. Let the society comprise N individuals. Then the amount of the available public good is $Q = \sum_{j=1}^{N} q_j$.

Consuming goods and contributing to solidarity both require time. Let the individual i's time budget be

$$e_i + q_i = 1, \tag{4}$$

where total time available to the individual is normalized to unity.

The individual derives well-being both from contributing to social solidarity as well as belonging to the social group and benefiting from her affiliation with it. For simplicity, let the decision-related benefit from contributing to solidarity be $B_1 q_i$, where B_1 may be either

[27] In the conventional neoclassical analysis, decision utility is identical to experienced utility.

positive or negative (assumed to be identical for all members of the social group). Let the benefit from the group affiliation be $B_2 Q$, where B_2 is a positive constant representing the sensitivity to belonging. These benefits are analogues to decision utility.

Then the individual's decision objective regarding solidarity may be expressed as

$$U_i^s = B_1 (1 - e_i) + B_2 \left((1 - e_i) + \sum_{j \neq i} q_j \right), \tag{5}$$

where the superscript s stands for solidarity.

3.3 Agency

We recognize two components of agency: (1) the ability to influence one's economic fortunes through one's own efforts and (2) freedom from economic hardship. Like solidarity, agency may be viewed as a value-driven purpose, related to the values of power, achievement, hedonism, and self-direction in Schwartz's value circumplex.

The first component can be captured by the effort return coefficient α. Regarding the second component, suppose that hardship occurs for an individual i when her income falls below a critical level: $y_i = \alpha (e_i + u_i) < y^-$, where y^- is a positive constant. This implies that $u_i < (y^-/\alpha) - e_i$, as illustrated in figure 3 for the random productivity variable u_i, uniformly distributed over $[-\frac{\delta}{2}, \frac{\delta}{2}]$. Thus the probability of hardship is

$$p_i = \frac{1}{\delta} \left(\frac{y^-}{\alpha} - e_i \right) + \frac{1}{2}. \tag{6}$$

This is a driver of agency since economic insecurity is both disempowering in its own right and reduces the individual's benefit from her ability to influence her fortunes through her own efforts.[28]

Let the decision-relevant benefit from agency be

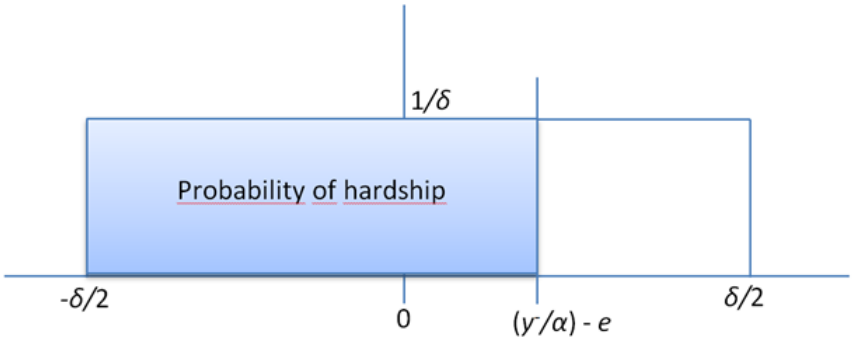
$$U^a = C\alpha (1 - p_i), \tag{7}$$

where the superscript a stands for agency and the parameter C (a positive constant) represents the marginal sensitivity to agency. In this specification, the two determinants of agency—(i) the effort return coefficient α and (ii) the probability of hardship $(1 - p_i)$–are complementary to one another—i.e., the more the ability to influence one's economic fortunes through one's own efforts contributes to one's well-being, the lower is one's probability of hardship.

[28] There are various psychological reasons for this, such as reducing the cognitive load available for empowering activities. This is the phenomenon of mental "bandwidth" (as discussed in Mullainathan and Shafir [2013])—i.e., the mental capacity to exercise fluid intelligence and executive control.

It could also be argued that empowerment also depends on the contribution of others to solidarity ($\sum_{j \neq i} q_j$), since social affiliations provide informal support networks that mitigate hardship and provide encouragement for empowering efforts. (Then the utility from empowerment could be expressed as $U^e = C\alpha (1 - p_i) (\sum_{j \neq i} q_j)$.) However, this aspect of empowerment can be interpreted as a complementarity between empowerment and solidarity and thus can be included in our understanding of solidarity.

Figure 3: The Hardship Probability



3.4 Decision-making

We now specify the individual's decision objective covering all three goals: economic prosperity (U^c), solidarity (U^s), and agency (U^a). In line with prospect theory, we specify goal-related reference points and goal-related utility functions that that display loss aversion (greater sensitivity to losses than to gains) and diminishing sensitivity to gains and losses relative to the reference point. In practice, the reference points depend on the status quo established in the past, subjective expectations, and social comparisons.[29] For the purposes of our analysis, they are assumed constant: R^c, R^s, and R^a. We specify the utility weighting functions in general terms: F^i, $i = c, s, a$, characterized by loss aversion and diminishing sensitivity.[30] Then the individual's decision objective may be specified as follows:

$$U_i^{csa} = F^c\left(U^c - R^c\right) + F^s\left(U^s - R^s\right) + F^a\left(U^a - R^a\right), \tag{8}$$

where the superscript *csa* stands for "consumption, solidarity, and agency" and the right-hand terms denote the consumption, solidarity, and agency objectives, respectively. In practice, the weighting functions F^i are dependent on the social context, as discussed below.

This decision objective is merely illustrative, meant only as an example that helps us understand how decisions could be made in our consumption-solidarity-agency framework of thought. For the moment, the qualitative conclusions from our comparative static analysis do not depend on reference points or utility weighting functions, and thus these can be ignored for now, so that we will assume that $F^c = F^s = F^a = 1$ and $R^c = R^s = R^a = 0$. Later in our analysis, when gains and losses are compared and the social context changes, these simplifying assumptions will be dropped.

Under these simplifying assumptions, we obtain the individual i's effort decision by maximizing the decision objective with respect to a_i, taking the contributions of all other individuals as given:

[29]For example, Frederick and Loewenstein (1999) examine reference points influenced by past experience; Pervin (1989) explores the influence of subjective expections; and Suls and Wheeler (2000) focus on the influence of social comparisons.

[30]This function may, for example, take the form proposed by Tversky and Kahneman (1992):

$$\begin{aligned} F(v) &= v^\gamma \text{ if } v \geq 0 \\ F(v) &= -\lambda(-v)^\gamma \text{ if } v < 0 \end{aligned}$$

where v is an outcome, $\lambda > 1$ is the constant coefficient of loss aversion, and γ is a constant $(0 < \gamma < 1)$.

$$e_i^{csa} = \alpha \left(A - B_1 - B_2 + \frac{C}{\delta} \right). \tag{9}$$

For effort to be positive, we assume that the consumption and agency effects of work effort $(A + \frac{C}{\delta})$ are greater than the solidarity effects $(B_1 + B_2)$.

This effort equation implies that

- effort rises with (i) the marginal utility of consumption A (i.e., $\frac{\partial e_i}{\partial A} > 0$), (ii) the marginal utility from agency C (i.e., $\frac{\partial e_i}{\partial C} > 0$), and (iii) the effort return coefficient α; and
- effort falls with (i) the marginal utility from contributing to and partaking of solidarity (B_1 and B_2, respectively, i.e., $\frac{\partial e_i}{\partial B_1} < 0$, $\frac{\partial e_i}{\partial B_2} < 0$) and (ii) the productivity dispersion δ (i.e., $\frac{\partial e_i}{\partial \delta} < 0$).

This effort decision implicitly involves taking the tradeoffs among the various goals into account. This effort decision does not necessarily maximize the individual's well-being, as we now proceed to show.

3.5 Well-Being

In accordance with a sizeable behavioral economics literature[31] on that distinguishes between "experienced utility" (i.e., "enjoying") and "decision utility" ("wanting"), we recognize that the criteria for evaluating one's well-being may differ from one's decision objectives. Analogously to our treatment of decision objectives, we derive an illustrative welfare function that is merely an example of how well-being may be evaluated in our consumption-solidarity-agency framework.

We begin with the plausible claim that consumption, solidarity and agency are not completely substitutable. Solidarity and agency cannot be enjoyed before one's basic consumption needs have been met, and greater levels of consumption (perhaps up to some limit) permit greater enjoyment of solidarity and agency. The enjoyment of consumption is limited in the absence of empowerment and solidarity (e.g., a meal is less enjoyable in solitary confinement than under conditions of freedom). Solidarity may become oppressive in the absence of agency, and so on. In short, we recognize that human well-being requires consumption, solidarity and agency to be in a balanced relation with respect to one another.

This balance may best be conceived in allostatic terms[32]—that is, there may be a range of values over which these goals are in balance and a range of values over which they can compensate for one another. Within these ranges of balance, well-being depends on the degree to which each goal is achieved; outside these ranges, well-being is largely determined by the goal that is most underachieved. In practice, these ranges are determined by cultural factors and past experience. These determinants, however, lie beyond the scope of our analysis. For our purposes, it suffices to represent this balance in terms of a simple, rigid relation among the goals. Specifically, we specify the following "balance-oriented well-being function"

$$V^b = \min \left(U^c,\ \beta U^s,\ \gamma U^a \right), \tag{10}$$

[31] See, for example, Tversky and Griffin (1991); Kahneman, Wakker, and Sarin (1997); Kahneman and Thaler (2006); Loewenstein and Adler (1995); and Schwarz and Strack (1999).

[32] See, for example, Sterling (2004).

where β and γ (positive constants) are fixed coefficients that, in practice, are culturally and historically determined. For example, given that the level of consumption utility is $U^c = \overline{U}^c$, the maximum benefits to be derived from solidarity and agency are $U^s = \frac{1}{\beta}\overline{U}^c$ and $U^a = \frac{1}{\gamma}\overline{U}^c$, respectively.

This non-substitutability among the goals means that well-being cannot be summarized by a weighted average of goal satisfactions. For example, a starving person cannot be compensated for lack of food by opportunities for solidarity and agency. Instead, the evaluation of well-being requires consideration of a "dashboard" of goal satisfactions. Such a dashboard merely provides components of well-being. A full assessment of well-being, however, is possible only once the determinants of goal balance have been specified. Since these determinants lie outside the scope of this study, the empirical analysis below aims only to provide such a dashboard.

We claim that although a balance among our goal satisfactions is important for the evaluation of well-being, this balance is often neglected in decision making. Over the past few decades, for example, there have been a plethora of studies exploring the consequences of imbalance among goal satisfactions among people who devote much time and energy to the pursuit of selfish materialistic and consumerist goals. For example, Kasser and Ryan (1993) and Sheldon and Kasser (1998) found that people who gave financial success relatively heavy weight among their goals reported relatively high levels of depression and anxiety and relatively low levels of self-actualization (measured by personal growth and authenticity) and vitality. Strong associations have been measured between materialism and depression (Wachtel and Blatt [1990]; Mueller et al. [2014]; Wang et al. [2017]) and between materialism and social anxiety (Schroeder and Dugal [1995]). Kasser et. al. (2004) and Williams et al. (2000) reported that people with a strong materialistic value orientation were relatively likely to be users of tobacco, alcohol and drugs. Richins and Dawson (1992) found a significant negative association between materialism and life satisfaction for American adults. Roberts and Clement (2007) observe that materialism is negatively correlated with various quality of life domains. This negative association was also found in a study by Diener and Oishi (2000) for college students in 41 countries. Cohen and Cohen (1996), Lane (2000), and Schmuck, Kasser, and Ryan (2000) find that materialistic values tend to crowd out strong social relationships, leading to feelings of alienation and disconnection from society. Studies of the materialistic and narcissitic "generation me"[33] find that its members are relatively prone to insecurity, fragile self-worth, and poor interpersonal relationships.[34] They are examples of people who make decisions that ignore their need to balance their consumption needs (receiving much attention) and their solidarity needs (which are neglected).

These and many other studies lead us to expect that decision objectives may differ substantially from evaluations of well-being. This is confirmed in various empirical studies. For example, Tversky and Griffin (1991) observe that actual payments matter more for decision objectives than for well-being assessments, whereas social comparisons are more important for evaluating well-being. Loewenstein and Adler (1995) find that people's decision objectives underpredict the degree to which well-being adapts to changes in context.

In line with these findings, our portrayal of decision objectives (equation [8]) differs from our assessment of well-being. Our well-being dashboard is simply meant to put our empirical

[33]For example, Twenge (2014).

[34]Much relevant research is surveyed, for example, in Kasser (2002).

results below into an illustrative analytical context, helping us understand why well-being needs to be measured through a dashboard and highlighting the role of goal balance in the assessment of well-being.

In the well-being dashboard relevant for the theoretical model above, the balance-oriented well-being indicator V^b influences an individual's well-being in the same way as a reference point does. For simplicity, our illustrative model assumes that loss aversion is specified with respect to the average between the balance-oriented well-being indicator and the reference point:

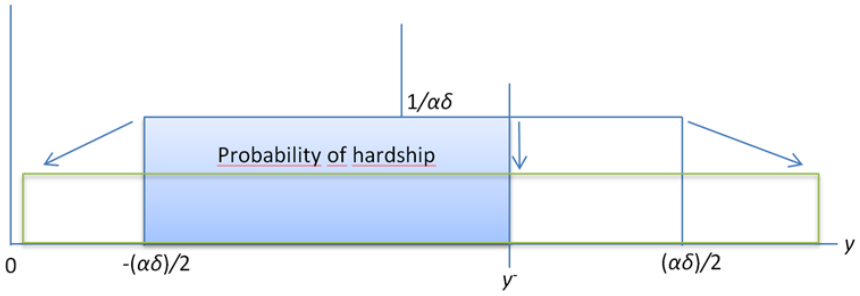
$$\begin{aligned} V^c &= G^c\left(U^c - \frac{V^b + R^c}{2}\right), \\ V^s &= G^s\left(U^s - \frac{V^b + R^s}{2}\right), \\ V^a &= G^a\left(U^a - \frac{V^b + R^a}{2}\right), \end{aligned} \tag{11}$$

where $G^i, i = c, s, a$ are "goal satisfaction functions" that, like the decision objectives, display loss aversion and diminishing sensitivity. In general, these functions may differ from the decision objectives.[35]

3.6 Welfare Effects of Inequality

This model provides a broader framework for thinking about the welfare effects of inequality, by indicating that inequality is not necessarily a social ill leading to the disintegration of society (as left-wing commentators claim) or a social blessing that motivates people to work hard (as right-wingers propose). We will show that whether inequality raises or reduces well-being depends on what generates it and on its impact on solidarity and agency.

Figure 4: The Income Distribution



In the context of our model, an increase in productivity risk δ and a rise in the effort return coefficient α may both raise income inequality in our model, but their consequences for well-being are markedly different. The initial distribution of income in our model is illustrated by the shaded rectangle in figure 4. Inequality can be measured by the dispersion

[35]Carter and McBride (2013) provide empirical estimates of such a satisfaction function, show that goal satisfaction is also characterized by loss aversion and diminishing sensitivity, and explain how it differs from decision objectives.

of $y_i = \alpha(e_i + u_i)$—namely, by $\alpha\delta$. Note that a rise in the effort return coefficient α and an equal rise productivity risk δ, for any given work effort input, have the same effect on inequality. For both changes, the distribution of income changes from the shaded rectangle to the flatter, unshaded rectangle in the figure.

Recall that hardship occurs when an individual's income falls below a critical level: $y_i = \alpha(e_i + u_i) < y^-$, and assume that, for the effort decision (9) at which $e_i = e^{csa}$, there is no hardship when the random productivity variable u_i is at its mean level ($u_i = 0$), so that $\alpha e_i > y^-$. For simplicity, we ignore the effects of balance-oriented welfare and reference points on well-being. Then the effect of an increase in the effort return coefficient α on agency well-being is

$$\frac{dU^a}{d\alpha} = \left(\frac{3}{2}C + \frac{Ce_i}{\delta}\right)\left(\sum_{j\neq i} q_j\right) + \left(A - B_1 - B_2 + \frac{C}{\delta}\sum_{j\neq i} q_j\right)\frac{\alpha C}{\delta} > 0.$$

By contrast, the effect of an increase in productivity risk δ on agency well-being, for the given effort level above, is

$$\frac{dU^a}{d\delta} = \frac{\alpha C}{\delta^2}\left(\sum_{j\neq i} q_j\right)\left(\frac{y^-}{\alpha} - e_i - 1\right) < 0.$$

It is straightforward to show that these qualitative conclusions still hold when we take the welfare effects of balance-oriented welfare and reference points into account. In short, although the effort return coefficient α and productivity risk δ have the same effect on inequality, the former raises agency well-being whereas the latter reduces it. In short, inequality can be advantageous or disadvantageous; it all depends on what generates it.

3.7 A New Analytical Perspective on the Effects of Globalization and Automation

This model suggests a new perspective on how the current forces of globalization and automation influence economic and social decisions and well-being in advanced industrialized countries. For simplicity, we focus on one widespread effect of globalization and automation: a rise in the productivity and earning power of highly educated and skilled people, while the codifiable and offshorable work of the routine white-collar and blue-collar workers is replaced by machines and low-wage workers in developing countries. We capture this development simply by examining the repercussions of a rise in the effort return coefficient for high-skilled people (whose skills increasingly have a global reach and who can take advantage of the productivity gains from the digital revolution) while the effort return coefficient remains unchanged.

We will show that in the conventional model above, this development makes the high-skilled people better off while leaving the low-skilled people no worse off. In welfare terms, this is a Pareto improvement, and thus the forces of globalization and automation are to be welcomed. In the extended model that includes solidarity and agency, however, this development has different implications for well-being. The reason is that the benefits of globalization and automation do not fall equally on economic prosperity, solidarity and agency. In particular, these benefits can be expected to fall more on economic prosperity and agency

than on solidarity for the high-skilled people. The reason is related to Baumol's cost disease. Contributions to social solidarity—reliant on interpersonal relationships within social networks—intrinsically require people to spend time. While the time required to produce (quality-adjusted) food, vehicles, financial services, communication equipment, and many other goods and services has declined dramatically over the past quarter of a century, the time required to maintain family ties, friendships, and other social allegiances has not changed much over this period.[36]

In the context of our extended model, we will show that when high-skilled people experience a rise in their productivity in producing goods and services, but little change in their productivity in social solidarity, they spend more time on the former and consequently withdraw some of their support for community activities. This withdrawal has adverse welfare consequences for both high- and low-skilled people within the society. These adverse consequences for high-skilled people may or may not outweigh the beneficial consequences of their increased productivity in goods and services production. Meanwhile, low-skilled people experience the adverse welfare consequences of their shrinking social support systems without the beneficial consequences of higher productivity. In short, this framework of analysis indicates that globalization and automation have mixed implications for well-being. Our analysis also suggests that these forces need to be supplemented by social policies that promote community building in order for their beneficial welfare effects to become dominant.

To fix ideas, suppose that the society is populated by (1) high-skilled people (H), associated with an effort return coefficient α_H, and (2) low-skilled people (L), associated with the coefficient α_L. In this context, suppose that globalization and automation raise α_H, leaving α_L unchanged.

For simplicity, we again ignore the effects of balance-oriented welfare and reference points on well-being (so that decision-related benefits are equivalent to welfare), and, furthermore, we reduce our expression for agency utility to

$$U_i^a = C\alpha_i, \tag{12}$$

where $i = H, L$. To rationalize this simplification, recall that agency utility (7) depends on the effort return α_i and the probability of hardship. Note that the latter component is related to the income that generates consumption utility. Thus if we reinterpret our consumption utility to include this element of agency, then the combination of this consumption utility and our simplified agency utility roughly captures our original conception of agency.[37]

In the conventional model above, the rise in the high-skilled effort return coefficient α_H leads to a rise in effort: $e_H^c = A\alpha_H$ (by equation [3]). Since the average welfare of a high-skilled person (for whom $u_i = 0$) at this effort level is $U_H^c = \frac{1}{2}(A\alpha_H)^2$, this skilled person's welfare rises: $\frac{dU_H^c}{d\alpha_H} = A^2\alpha_H > 0$. The low-skilled person's welfare remains unchanged, since α_L has not changed. This is the standard result that globalization and automation make the skilled people better off, without making the low-skilled people worse off, and thus these developments are to be welcomed since they represent Pareto welfare improvements. Our model, by contrast, offers a different picture.

The well-being of the high-skilled people is[38]

[36]For an economic analysis of this effect, see Snower and Bosworth (2016).

[37]Of course, this approximation does not capture the complementarities among the three components of empowerment utility.

[38]We substitute the effort decision (9) of a high-skilled individual into her well-being function.

$$U_H^{csa} = \left(\alpha_H A - \frac{1}{2}\left(\alpha_H A - B_1 - B_2\right)\right)\left(\alpha_H A - B_1 - B_2\right)$$
$$+B_1\left(1 - \alpha_H A + B_1 + B_2\right) + B_2\left(1 - \alpha_H A + B_1 + B_2 + \sum_{j \neq i} q_j\right) + \alpha_L C,$$

where the rewards from solidarity may be expressed as

$$\sum_{j \neq i} q_j = N_H\left(1 - e_H\right) + N_L\left(1 - e_L\right). \tag{13}$$

A rise in the effort return coefficient α_H leads to the following change in the well-being of the high-skilled:

$$\frac{dU_H^c}{d\alpha_H} = A\left(\alpha_H A - B_1 - B_2\right) - B_2 A\left(N_H - 1\right) + C.$$

Observe that the well-being of the high-skilled does not invariably rise, on account of a solidarity externality. The reason is that the rise in the effort return coefficient α_H has led to a rise in work effort, thereby reducing the contributions of all high-skilled people to solidarity. There can be no assurance that their increased well-being from consumption and agency is necessarily greater than their decreased well-being from solidarity.

Furthermore, the rise in the effort return coefficient α_H leads to an unambiguous fall in the well-being of the low-skilled:

$$\frac{dU_L^c}{d\alpha_H} = -B_2 N_H A s < 0.$$

The reason is that the high-skilled have reduced their contributions to solidarity, and this reduces the well-being of the low-skilled, since their effort return coefficient is unchanged.[39]

These qualitative results are reinforced when loss aversion is taken into account, through the reference points R^i and the utility weighting functions F^i, $i = c, s, a$ (as specified above). After all, loss aversion raises the loss of the low-skilled people relative to the gains of the high-skilled people.

3.8 The Role of Context-Dependent Objectives

In this section, we explore the implications of these developments—a greater focus by the high-skilled on economic prosperity and a withdrawal of support for wider community activities—for the social context and thereby for the economic and social decisions of high- and low-skilled workers. On account of these developments, it can be expected that the high-skilled people will devote more attention to economic prosperity, since it is the primary source of their success. The low-skilled people understand that economic prosperity cannot be their primary source of social esteem, since they are relatively unsuccessful in this regard. Nor can they

[39]Needless to say, even if the effort return coefficient of the low-skilled were to rise, their well-being would not necessarily rise: $\frac{dU_L^c}{d\alpha_L} = A\left(\alpha_L A - B_1 - B_2\right) - A\left(N_L - 1\right) + C$ for the same reason (the externality from solidarity) as noted above.

place hope in agency, since they are relatively unsuccessful in this domain as well. Under these circumstances, they may fall back on solidarity as the focus of their attention. If this solidarity is based on nationalism, ethnicity, religion, or other forms of group affiliation, they are likely to feel resentful of the high-skilled elites, who have withdrawn from some communal activities, thereby reducing their sources of social support both informally (through local community groups) and formally (through financial support for public amenities, education, and health in local communities). This resentment may become an engine for populism and nationalism among the low-skilled.[40] Alternatively, the low-skilled people may continue to derive esteem from economic prosperity, but resent the high-skilled elites for getting more than their just rewards due to corruption and rent-seeking activities. In response, their resentment may contribute to populist social activities aimed at bringing down the corrupt money-grabbers in the upper reaches of the income distribution.[41]

In the context of our extended model, the skilled people's increased attention to economic prosperity can affect their objectives, giving greater importance to material things and less to social matters. This change of objectives may be captured by a rise in the coefficient A (the marginal utility of consumption) in their objective function (8) relative to the coefficients B_1 and B_2 (the marginal benefits from contributing to and receiving social solidarity). Meanwhile, the low-skilled people's rising attention to social communities may be depicted by a rise in B_1 and B_2 relative to the coefficient A.

Thus the effort input of high-skilled people ($e_H^{csa} = \alpha\,(A_H - B_{1,H} - B_{2,H})$) rises relative to the effort of their low-skilled counterparts ($e_L^{csa} = \alpha\,(A_L - B_{1,L} - B_{2,L})$). This implies that even if the productivity gains from globalization and automation fall equally on the high- and the low-skilled people, these groups may respond differently. In particular, the high-skilled people would earn higher incomes since they would work harder, as they are more focused on economic prosperity. Conversely, the low-skilled people would devote a relatively greater share of their time to community activities and feel the abandonment of the elites more strongly. In short, the changes in the objectives of these groups widen the social divisions among them. This makes it more likely that the high-skilled people benefit from the productivity effects of globalization and automation, whereas the adverse welfare effects on the low-skilled people become worse.

These results are reinforced once we take account of the reference points R^i and the utility weighting functions F^i, $i = c, s, a$. The rise in the high-skilled incomes will, over time, lead to a rise in their consumption-related reference point, thereby reducing their gains from globalization and automation. Meanwhile, the resentment of the low-skilled people, fueled by populist politics, may make them more sensitive to adverse social comparisons, raising their consumption-related reference point and thereby increasing their losses from their economic stagnation.

3.9 Preliminary Policy Implications

First, our analysis indicates that globalization and automation may be expected to become more clearly welfare-improving only if they are accompanied by policy measures to strengthen social communities, counteracting the decline in solidarity and agency that would otherwise result. Our results—particularly the social implosion that can accompany globalization and

[40]This argument is developed and substantiated in Collier (2018).

[41]We are grateful to an anonymous referee for this alternative construal of populism.

automation—can help account for the anger and disaffection felt by those who perceive that they have been left behind. Their resulting focus on social affiliation may take the form of identification with their nation. In the context of our analysis, it is clear that economic policies and social policies should not be formulated independently of one another, contrary to the common current policy practice of dividing responsibilities for these policies over different ministries and government departments.

Second, perfect competition among self-interested individuals in the free market does not lead to maximum economic efficiency. The reason is that selfish agents will contribute less to social solidarity than is socially desirable. After all, their contributions affect other people's benefit from contributing to solidarity, and self-interested individuals do not take this influence into account. Analogous externalities could be explored with regard to agency, since the agency of some people affects the agency of others in ways that are not mediated through the price system. In short, when *Homo economicus* is driven by the invisible hand of market forces, people do not make themselves as well off as they could be.

Finally, economic policies at the macroeconomic level must not be implemented independently of those at the microeconomic level. The reason is that there is a crucial meso-level of social groups at which important human needs and purposes are satisfied, and which influence economic activity and are influenced by it.[42]

4 Solidarity and Agency/Empowerment Indexes

In this section, we present our SAGE indexes. Our evidence indicates that solidarity and agency are empirical phenomena that are distinct from GDP per capita, in both time series and cross-section terms. The same is true with regard to Gini coefficients of income inequality.[43] Since solidarity, agency, GDP per capita, and environmental performance represent different value-driven purposes and different sources of human well-being, the combination of these indexes provides a broader overview of the quality of life than do indexes of economic prosperity and environmental sustainability alone.

With respect to our illustrative theoretical analysis, our indexes are meant to be indicators of well-being, not decision objectives (analogous to decision utility). Furthermore, empirical considerations concerning welfare reference points or balance-oriented welfare lie beyond the scope of this paper. Thus our indexes are meant to be the empirical counterparts of the three goals—regarding consumption (U^c), agency (U^a), and solidarity (U^s)—in our theoretical model.

4.1 The Social Solidarity Index

Social solidarity concerns the idea of belonging within social groups, which may be nested within larger social groups and political institutions that pursue complementary ends. Social solidarity is closely related to social cohesion and social inclusion, concepts that have received

[42]In our model, for example, time devoted to work effort cannot be devoted to social affiliation, and thus social affiliation affects economic activity. Conversely, a change in economic incentives (such as a change in the empowerment parameter) affects social affiliation.

[43]It is also true of environmental sustainability, but since this is intuitively obvious, we do omit the empirical evidence for it.

growing attention over the past years and have a broad range of definitions, which in literature are often linked to different types and levels of solidarity. Abela et al. (2004) describe local, social, and global solidarity, while Radtke (2007) distinguishes between subnational, national, transnational, or international solidarity. Further conceptualizations include civic solidarity (Habermas, 1992, 1997), ethnic and national solidarity (Calhoun, 2007), negative solidarity (Komter, 2005), and radical solidarity (Arnsperger and Varoufakis, 2003). Overall, the predominant conceptualization of social cohesion refers to a societal characteristic involving affiliative relationships between different people and a feeling of commitment towards other people. It can be conceptualized as vertical and horizontal interactions within a society, including norms such as trust, a sense of belonging, and the willingness to participate and help (Chan, To, and Chand, 2006).[44]

In our solidarity index, country performance is measured across three key components:

- Giving behavior is an indicator for showing social solidarity through three giving behaviors: helping a stranger, donating money, and volunteering time. (Source: CAF)
- Trust in other people is a measure based on the question: Generally speaking, would you say that most people can be trusted or that you need to be careful in dealing with people?. (Source: WVS)
- Social support reflects the sense that one is supported and can count on family and friends. We measure social support as the percentage of people who report that they have friends or relatives whom they can count on in times of trouble. (Source: OECD)

The first two components cover universalist aspects of solidarity (i.e., "inward" combined with "outward" solidarity), whereas the third component covers a particularist aspect (i.e., "inward" solidarity on its own). Whereas the first component is related to the benefit from contributing to solidarity (the coefficient B_1 in the theoretical model above), the second and third components are related to the benefit from group affiliation (the coefficient B_2).

The solidarity index is calculated as the arithmetic mean of the standardized input variables. We provide data for 35 countries for the years from 2007 to 2017. Over the past decade (2007–2017), 16 of the 35 countries have experienced a decline in the solidarity score; for 3 it has remained unchanged; while the score has increased for 16 countries. The six countries that experienced the highest drop in the solidarity score are Mexico, Czech Republic, United States, Hungary, Italy, and United Kingdom. Reasons for this drop, in terms of the components of the solidarity index, differ between countries. The United States, for example, shows declining levels of trust and social support, while for Italy the main driving factor of the country's downturn in the solidarity index is the sharp decline in the giving index.

[44] Jenson (1998) maps social cohesion into five dimensions: (1) belonging/isolation (share of common values, feeling of belonging to the same community); (2) insertion/exclusion (a shared market capacity, particularly regarding the labor market; in other words, who has/does not have opportunities to participate in the economy); (3) participation/passivity (involvement in management of public affairs, third sector); (4) acceptance/rejection (pluralism in facts and also as a virtue—i.e., tolerance regarding differences); (5) legitimacy/illegitimacy (maintenance of public and private institutions that act as mediators—i.e., how adequately the various institutions represent the people and their interests).

4.2 The Agency/Empowerment Index

Agency concerns people's ability to affect their prospects through their own efforts, both economically and politically. In our agency/empowerment index, country performance is measured across five key components:[45]

- Labor market insecurity is an indicator for expected earnings losses in case of unemployment and includes the risk of becoming unemployed, the expected duration of unemployment, and the degree of mitigation against these losses provided by government transfers to the unemployed (effective insurance). (Source: OECD)
- Vulnerable employment is measured as contributing family workers and own-account workers as a percentage of total employment. (Source: World Bank/ILO)
- Life expectancy serves as a proxy for life, health, and working conditions that are a prerequisite for empowered life decisions. (Source: World Bank)
- Years in education is measured as mean years of schooling of the population aged 25 years and above. (Source: UNESCO)
- Confidence in empowering institutions measures the degree to which people believe that their government serves their needs. Our measure is based on the question: "In this country, do you have confidence in [. . .] the national government? (Source: Gallup World Poll)

The agency index is calculated as the arithmetic mean of the standardized input variables. We provide data for 35 countries for the years from 2007 to 2017. While 21 countries exhibit a rising agency/empowerment index between 2007 and 2017, 8 have deteriorated and 6 remained unchanged. Among the countries that have experienced a decrease in the agency/empowerment index score are Greece, Spain, and Mexico. An increase is observed, for example, in Japan, Germany, and Australia. In the United States the agency/empowerment index decreased after the 2008 financial crisis but has recovered since 2013, although one component of the index—confidence in empowering institutions—decreased dramatically over the past decade.

4.3 Four Dimensions of Well-Being

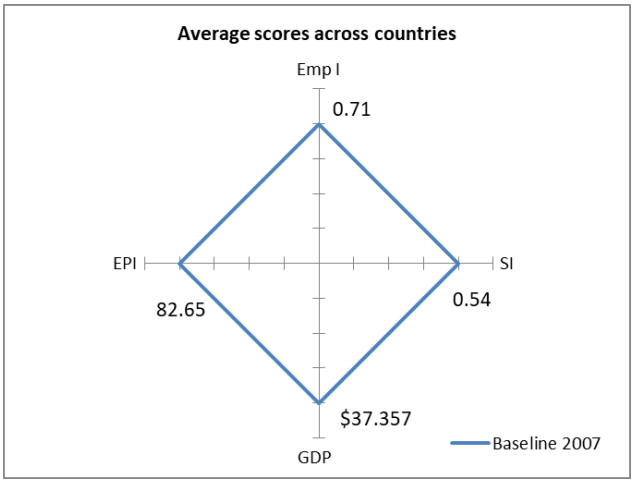
Let us now examine the degree to which the solidarity and agency indexes provide new information beyond that contained in GDP per capita and the Gini coefficient of income inequality.

The well-being dashboard has four axes:

- The upper vertical axis depicts the agency/empowerment score (Emp),
- the right horizontal axis shows the solidarity score (SI),

[45] Once again, the appendix provides an overview of the methodology, official definitions, and sources. Due to incomplete data, the empowerment scores for Brazil, China, India, Russia, and South Africa include only the variables vulnerable employment, life expectancy, and years in education.

Figure 5: Dashboard of well-being



- the lower vertical axis measures GDP per capita in constant US$ (based 2010) (GDP) and
- the left horizontal axis represents the Environmental Performance Index (EPI) score.

Both Emp and SI range between 0 and 1, with higher numbers representing higher levels of agency/empowerment and solidarity, respectively. The EPI measures environmental sustainability in various categories and ranges between 0 and 100, with higher values indicating higher sustainability.

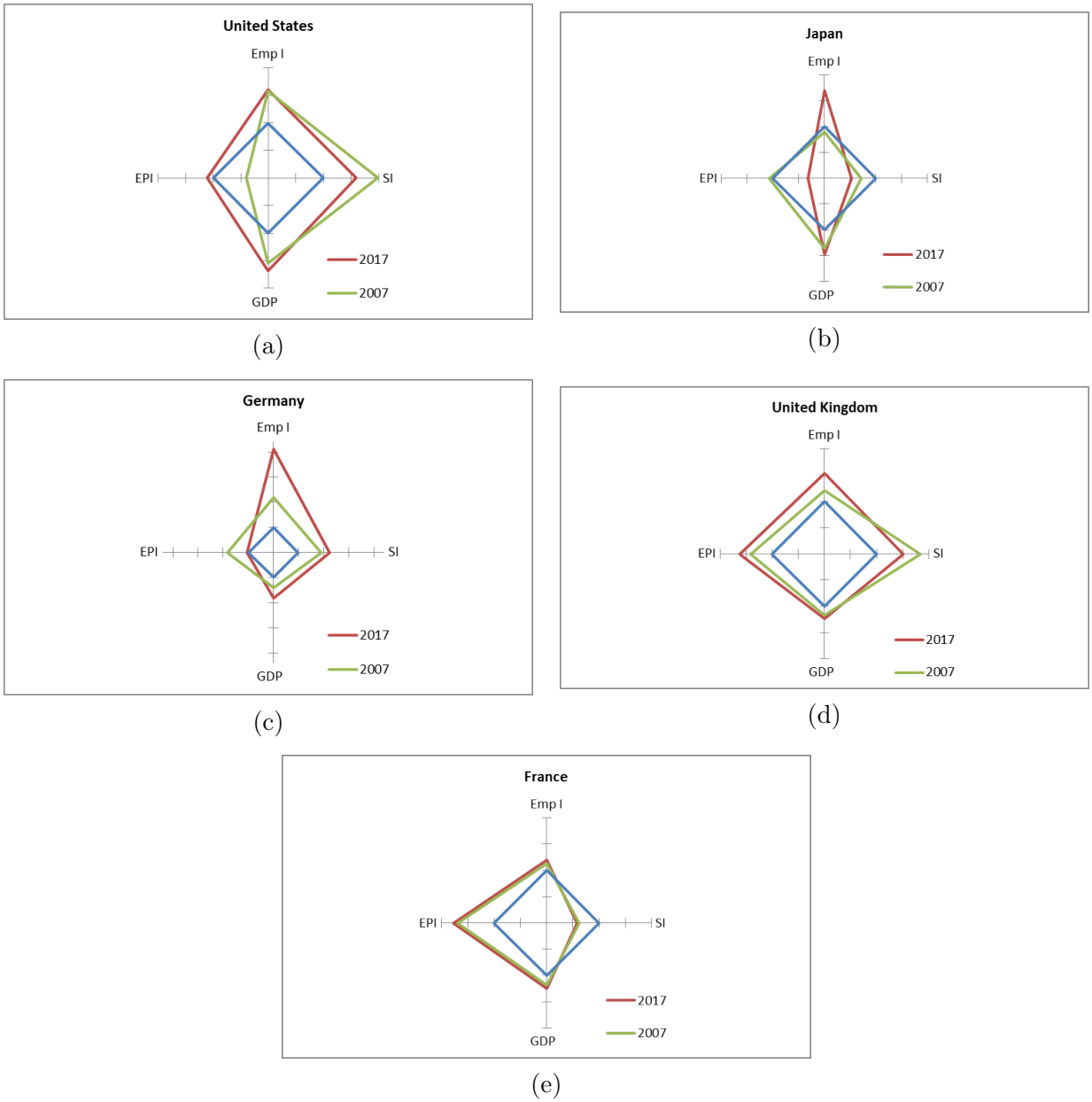
To help visualize countries' performance in terms of the well-being dashboard, we present the four indexes for selected countries in 2007 and 2017, relative to a baseline square (in figure 5). The baseline square (in blue) represents the average values of the four indexes across the countries in our sample in a base year (2007). (For a list of the sample countries, see the appendix.) The graphs are then calibrated to the average scores across countries of our baseline year 2007. In the baseline year 2007, the average Emp was 0.71 (SD=0.16) with a minimum score of 0.52 for Turkey and the highest score of 0.90 for Luxembourg. The average SI in 2007 was 0.54 (SD=0.20) with a range between 0.15 (Turkey) and 0.83 (Denmark). The average GDP per capita was $37,357 in 2007 (measured in constant US$, for base year 2010), with the lowest income country in our sample being India and the highest Luxembourg. The average EPI was 82.65, ranging from 60.30 in India to 95.5 in Switzerland.

Figures 6 and 7 show that there are considerable differences between the indexes across countries. There are also major differences in the degree of success different countries have had with regard to each of the indexes. While the green line represents the country scores in 2007, the red line represents the scores in 2017. Comparing the green and the red line, thus shows at one glance how a country developed over the past decade in each of the four dimensions.

Figure 6 shows the well-being dashboard for selected high-income countries.[46] The up-

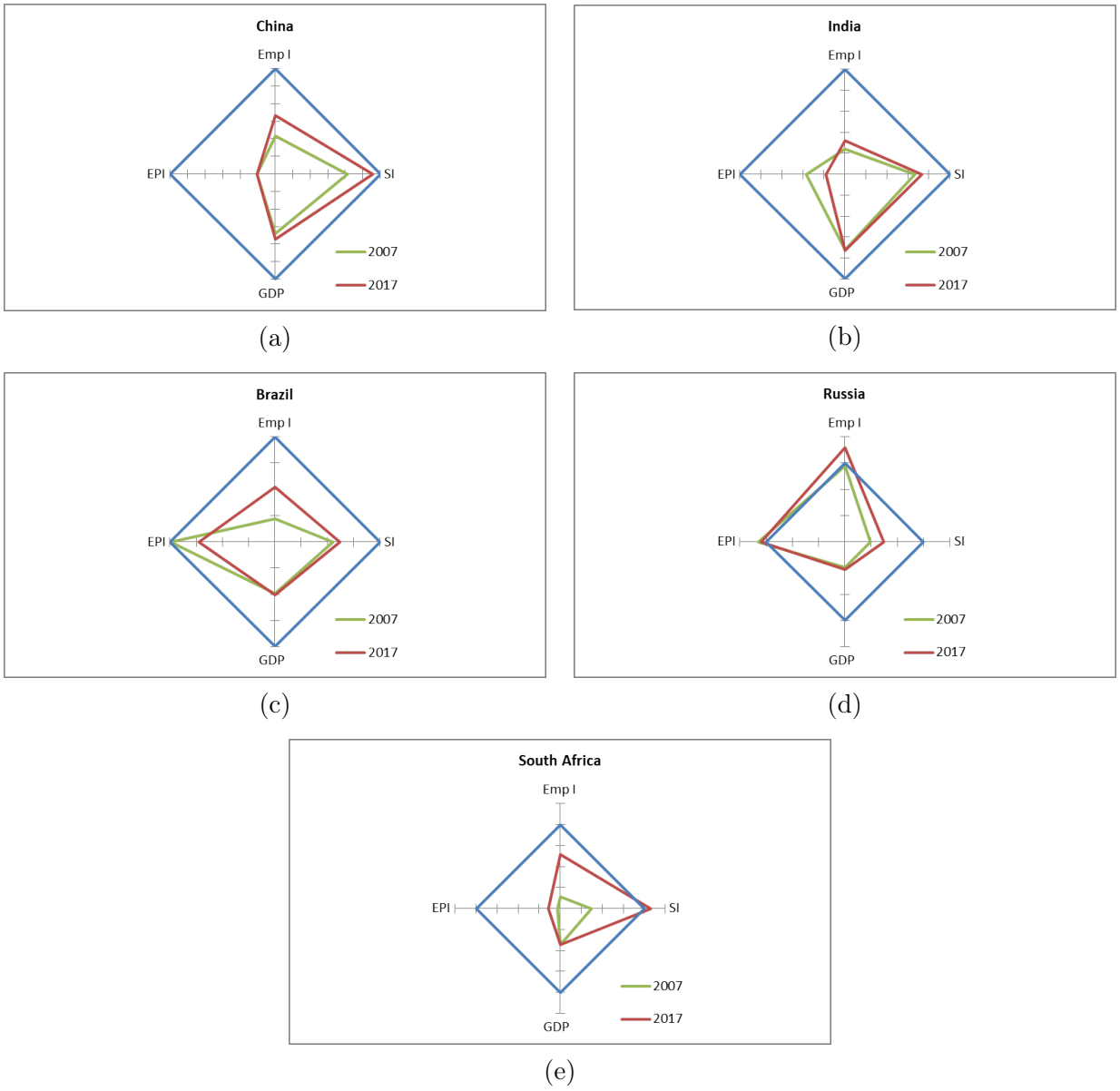
[46]Classification of countries according to the World Bank Country Classifications (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups).

Figure 6: Comparison of indexes of the four dimensions of human well-being in 2007 and 2017 for selected high-income countries



per left graph (figure 6a) depicts the time series development of the four dimensions for the United States between 2007 and 2017. One can observe that there was an increase in GDP per capita (from $49,856 in 2007 to $53,356 in 2017), accompanied by a stagnation in agency/empowerment (0.78 in 2007 and 0.79 in 2017) and a decrease in solidarity (from 0.73 in 2007 to 0.65 in 2017), as well as a slight increase in environmental sustainability (from 81 to 84.72). By contrast, Germany (figure 6c) has evolved quite differently during the same time span. The agency/empowerment index rose substantially (from 0.80 in 2007 to 0.91 in 2017), whereas the solidarity index slightly increased (from 0.63 in 2007 to 0.66 in 2017) as did GDP per capita ($41,832 in 2007 to $46,988 in 2017). On the other hand, Germany has

Figure 7: Comparison of indexes of the four dimensions of human well-being in 2007 and 2017 for selected middle-income countries



experienced a decrease in the Environmental Performance Index (from 86.30 to 84.26). This German development is one in the direction of what we have termed "liberal communitarianism" (see figure 2e in section 1)—that is, the promotion of both agency/empowerment and economic prosperity, alongside solidarity (at the expense of environmental sustainability). In this sense, the United Kingdom (figure 6d) has become more "neoliberal" (by the definition in our illustrative Figure 2b) from 2007 to 2017, since agency/empowerment and GDP per capita have risen, while solidarity has fallen. For France all four dimensions remained quite stable.[47]

[47]It is noticeable that France scores rather low in the solidarity index relative to the other selected high-income countries. This is true for all three dimensions of the solidarity index—giving behavior, trust in

The green line in relation to the blue line shows whether a country was scoring above or below the averages in 2007. For example, in 2007 GDP per capita in the United States was higher than the average, while its performance in environmental sustainability was below the average.

The dashboards also permit revealing cross-country comparisons. For example, the agency/empowerment index remained fairly stable in the United States and France, while it increased in Japan, Germany, and United Kingdom. The solidarity index has substantially declined in the United States, the United Kingdom, and to a smaller extent in Japan over the past decade. While the German agency/empowerment index increased substantially and the solidarity index rose as well, the United Kingdom experienced declining levels of agency/empowerment and solidarity. However, in terms of environmental sustainability, United Kingdom has increased its score over the past ten years, while Germany's score decreased.

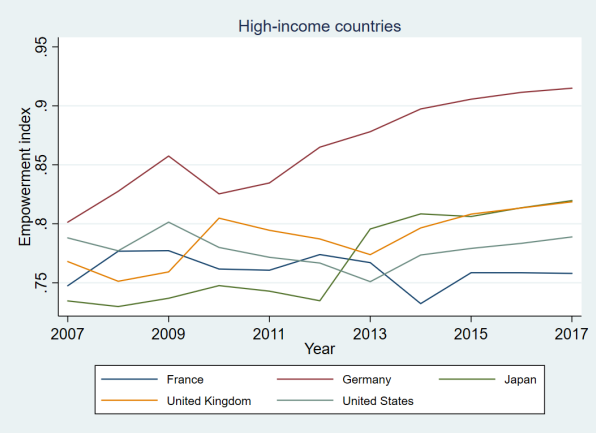
Figure 7 shows the well-being dashboard for selected middle-income countries. Most countries score below the average in all dimensions, but the countries' performance differs significantly across the indexes. China and South Africa have experienced changes in the direction of what we have termed "liberal communitarianism"—that is, low scores in environmental sustainability but rather balanced performance in agency/empowerment, solidarity and GDP per capita. In particular, South Africa has experienced a sharp increase in the agency/empowerment score (0.45 in 2007 to 0.60 in 2017) and the solidarity score (0.27 and 0.56, respectively), with stagnating GDP per capita. On the other hand, Brazil's EPI score has declined, while its agency/empowerment score has increased.

Figure 8 depicts time series for the agency/empowerment index for selected high- and middle-income countries. While the agency/empowerment index for Germany and Japan rose, especially since 2010/2011 and, to a lower degree, it also rose for the United Kingdom, this index has stagnated for the United States and France or has even decreased since the financial crisis in 2008. All selected middle-income countries—Brazil, China, India, Russia, and South Africa—have experienced an increase in the agency/empowerment index. This development was mainly driven by increases in life expectancy, particularly in South Africa, and years in education in Brazil and South Africa. Whereas high-income countries tend to exhibit a larger within-country variation in the agency/empowerment index than across-country variation, the opposite is true of the middle-income countries.

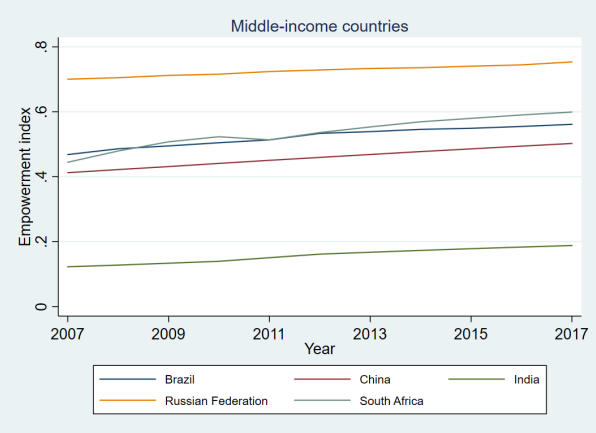
Figure 9 shows time series for the solidarity index for selected high- and middle-income countries. Most high-income countries show a substantial decrease in the solidarity index, most pronounced in the United States and United Kingdom. However, Germany experienced an increase over the last five years. In the selected middle-income countries, the solidarity

others, and social support. It can be argued that to some extent, social expenditure can crowd out personal giving (e.g., Inglehart 1997), a difference that might become visible in collectivist compared to individualist nations. The relationship between institutions, state capabilities, and informal social ties and networks is complex (Johnson et al. 2017). Here we define social solidarity as a sense of belonging within social groups that may be nested within larger social groups pursuing complementary ends. The fact that 5 Scandinavian countries are under the 10 highest ranking countries in our solidarity score in 2017 points to the direction that a well-developed welfare state and solidarity as defined here can go hand in hand.

Figure 8: Empowerment score for selected countries



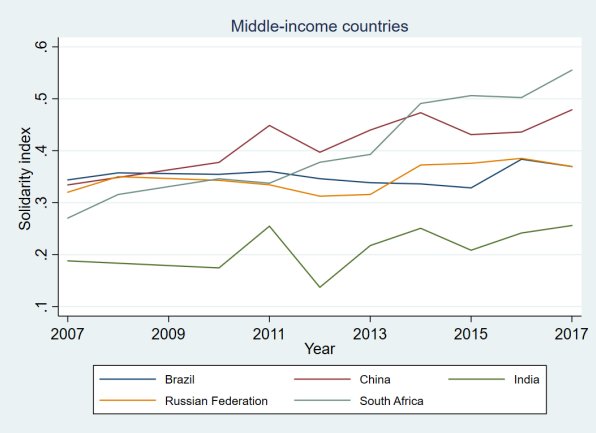
(a) Selected high-income countries



(b) Selected middle-income countries

Figure 9: Solidarity score for selected countries

(a) Selected high-income countries



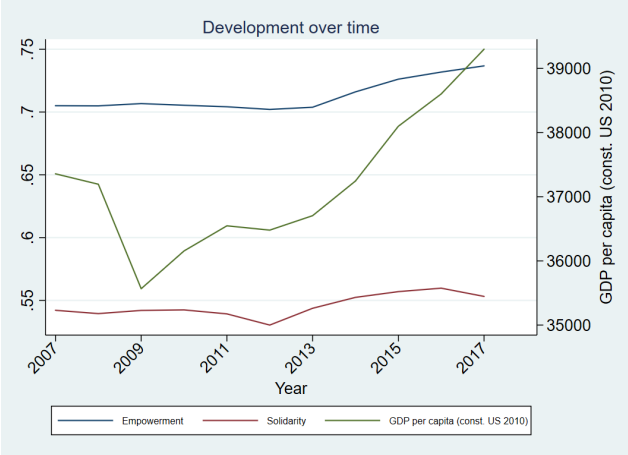
(b) Selected middle-income countries

index scores show a different pattern, with (slightly) rising scores in most countries.[48]

Figures 10, 11, and 12 show that solidarity and agency/empowerment follow time paths that are distinct from the time paths of GDP per capita. While GDP per capita rises in most OECD countries, the developments of the agency/empowerment and the solidarity indexes follow quite diverse patterns. In particular, the United States has experienced a progressive decoupling of GDP from agency/empowerment and solidarity in recent years, particularly after the financial crisis of 2008. While GDP has increased substantially, social solidarity

[48] A particular, high increase in solidarity can be observed in South Africa. The fact that solidarity increases after the 2008 financial crisis suggests that people in this country reacted with personal contributions. In fact, the dimensions—giving and social support—of the solidarity index show substantial increases in South Africa between 2007 and 2017. In countries in which "automatic stabilizers" kick in after crises, the reaction as measured by the solidarity index appears to be different. In this respect, one also has to acknowledge that the solidarity levels in the selected high-income countries are already at a much higher level.

Figure 10: Development of empowerment, solidarity, and GDP for all countries



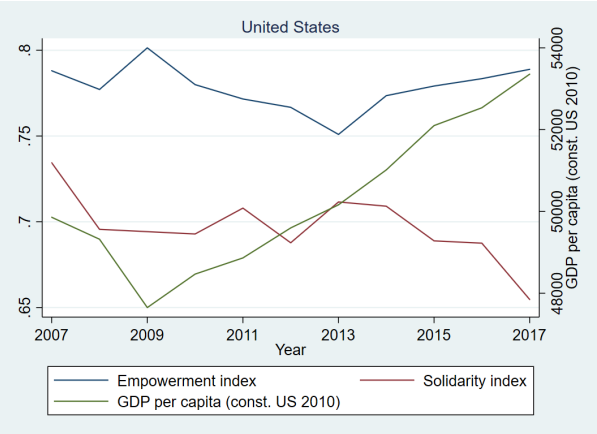
has fallen, and agency/empowerment stagnated.[49] In Germany and Japan, one can observe that agency/empowerment continues to rise along with GDP, while the development of social solidarity has stagnated. In the middle-income countries the development of the two indexes in relation to developments in GDP are quite diverse. While agency/empowerment has increased in all depicted countries, solidarity has increased in China and South Africa but stagnated in India, Russia, and Brazil.

Figure 13 depicts the correlation between the indexes of agency/empowerment and solidarity (on the one hand) and GDP per capita (on the other) over time across all countries. The time series show, that the correlation of the indexes with GDP has declined over the past decade. In particular, the correlation with agency/empowerment has fallen significantly. This latter decline is evidence that agency/empowerment has become decoupled from economic well-being.

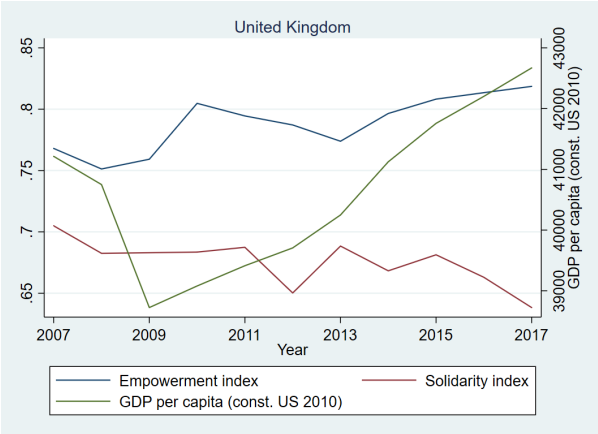
The degree to which solidarity is correlated with GDP per capita and the degree to which agency/empowerment is correlated with GDP per capita, however, varies substantially across countries. Figure 14a depicts the correlation between the solidarity index and GDP per capita (constant US$ 2010) across countries estimated over the time span 2007-2017 and figure 14b pictures the correlation between the agency/empowerment index and GDP per capita. About one-third of the countries show a negative correlation, another third have negligible correlation coefficient (between -0.3 and +0.3), while the final third shows moderate to strong positive correlations. Note, for example, the strong to moderate negative correlations of the Netherlands (-0.76), the United States (-0.58), and the United Kingdom (-0.38), while Norway (0.40) and Germany (0.69) show positive correlation coefficients. The correlation between the agency/empowerment index and GDP per capita ranges from moderately negative to strongly positive. The bulk of countries show a more or less pronounced positive correlation. Some countries, like Germany, show a high positive correlation (0.83), while others, like the United States, seem to have only a negligible positive correlation between the

[49] A similar pattern can be observed in the United Kingdom with the difference that here empowerment has slightly increased.

Figure 11: Development of empowerment, solidarity, and GDP for selected high-income countries



(a)



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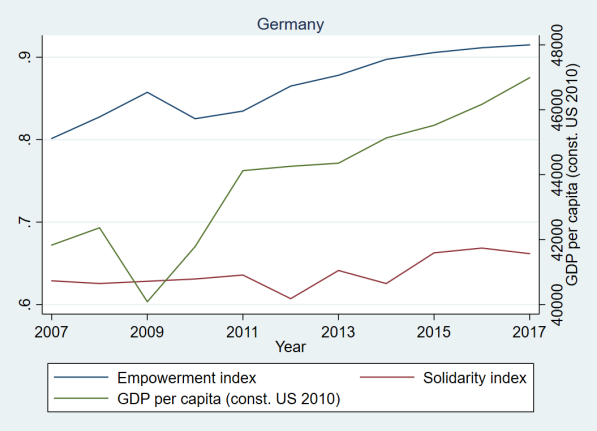

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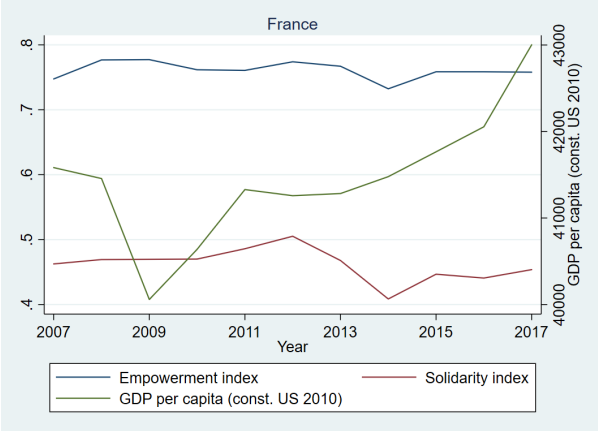

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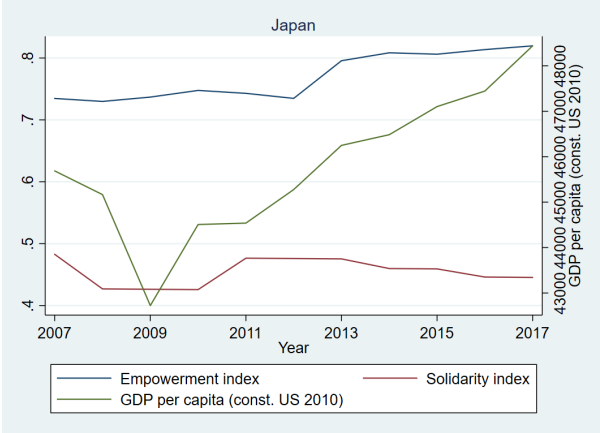
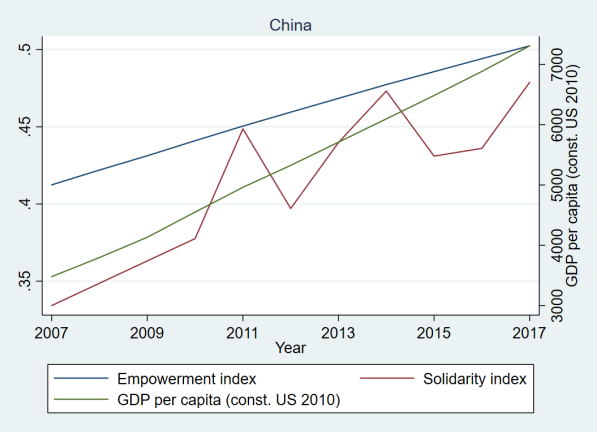
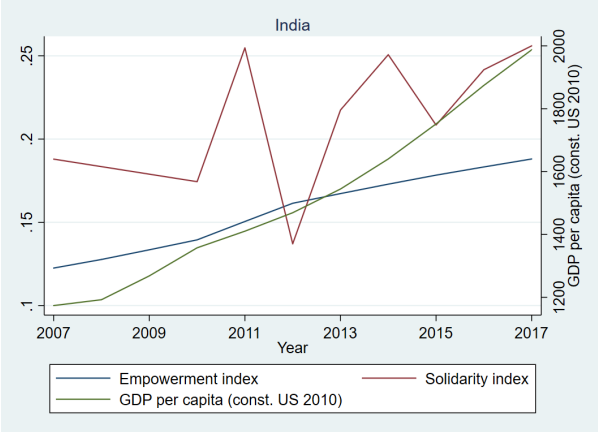


(e)

Figure 12: Development of empowerment, solidarity, and GDP for selected middle-income countries



(a)



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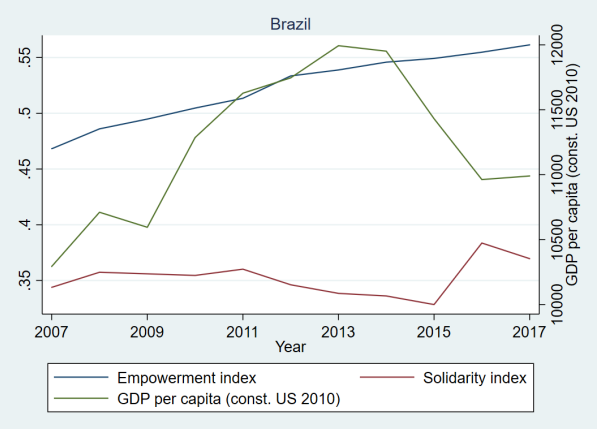

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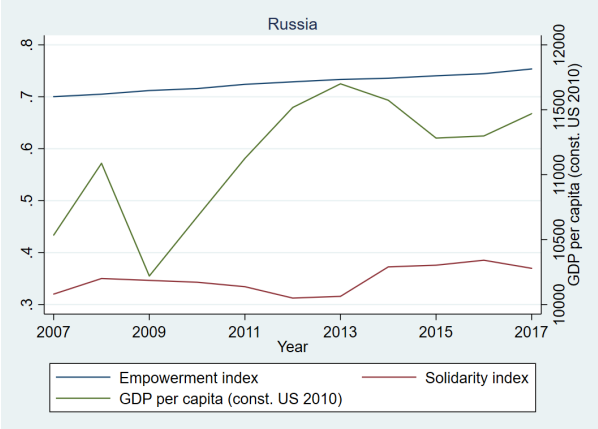

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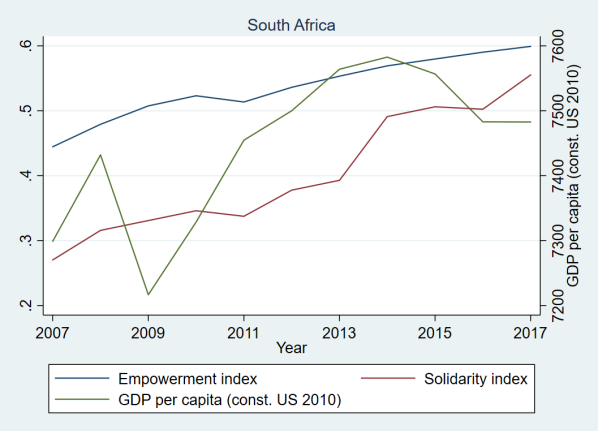
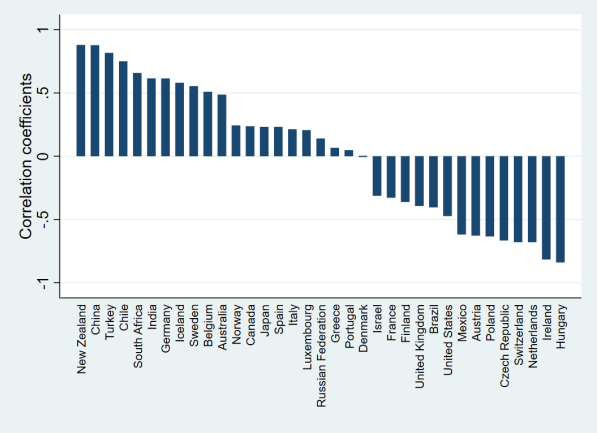


(e)

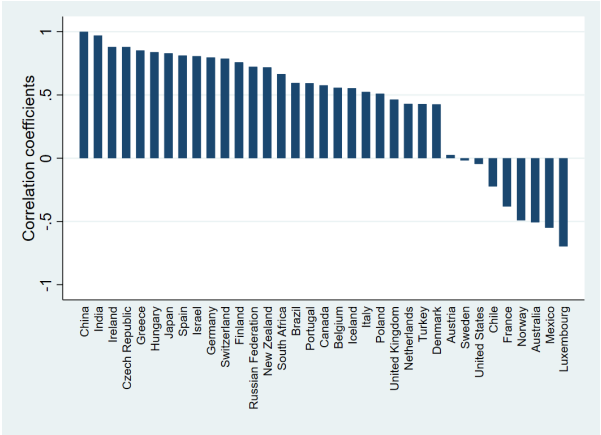
Figure 13: Correlation between indexes and GDP per capita over time across all countries

two dimensions.

Figure 14: Correlation between the indexes and GDP per capita across countries



(a) Solidarity index



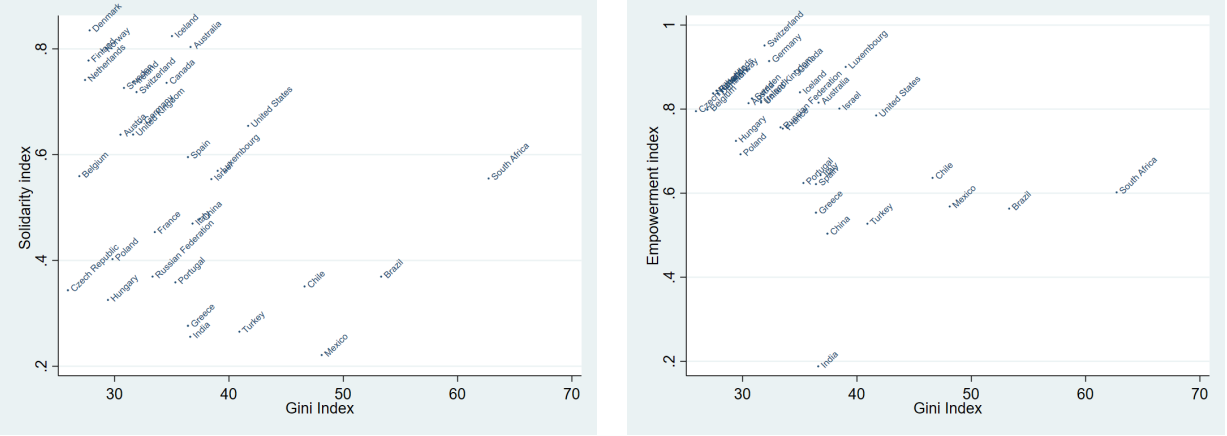
(b) Empowerment index

These figures clearly show that countries differ substantially from one another in the degrees to which social prosperity (in terms of solidarity and agency) have become decoupled from economic prosperity. This indicates that the solidarity, agency and material gain indexes capture quite distinct phenomena across countries.

Social problems—such as those arising from disempowerment and alienation (the opposite of solidarity)—are often attributed to inequality. Figures 15a and 15b depict scatterplots for the agency/empowerment and solidarity index and the Gini index across countries in 2017. The high dispersion illustrates that inequality does not capture the phenomena of solidarity and (dis-)empowerment. This shows that some of our major social problems cannot be attributed entirely to rising inequality.

In sum, the time series and cross-section evidence presented here confirm our hypothesis that solidarity and agency are phenomena that are distinct from economic prosperity and environmental sustainability. In particular, solidarity and agency follow time paths that

Figure 15: Index scores and Gini index across countries, 2017



(a) Solidarity index

(b) Empowerment index

are distinct from the time paths of GDP per capita and environmental sustainability. The degree to which solidarity is correlated with GDP per capita and the degree to which agency is correlated with GDP per capita varies across countries. We furthermore found suggestive evidence that inequality does not capture the phenomena of solidarity and disempowerment either.

The substantial fall in the correlation between solidarity and agency/empowerment (on the one hand) and GDP per capita (on the other) in many countries suggests that, for these countries, economic prosperity is becoming decoupled from social prosperity.

5 Concluding Remarks

This paper extends the traditional conception of human well-being in economics—centered on GDP per capita, adjusted for inequality and environmental costs and benefits—through the incorporation of solidarity and agency in our theoretical and empirical analysis.

Solidarity is recognized to be a fundamental source of well-being since humans are social creatures with social needs and objectives. The success of the human species depends vitally on our ability to cooperate to achieve mutually beneficial ends. Thus our well-being depends on the degree to which we are embedded in our social groups. Social isolation generally leads to mental and physiological dysfunctions.

Agency is also a fundamental source of well-being since our evolutionary success also depends on our ability to innovate. Disempowerment is associated with major psychological and physical costs. Thus our well-being depends on the degree to which we are able to shape our physical and social environment purposefully through our personal efforts.

We provide a simple theoretical analysis to exemplify how solidarity and agency can influence economic activity by affecting people's objectives.[50] Furthermore, we have con-

[50]It is important to keep in mind that this analysis is merely meant to illustrate a particularly simple way in which to integrate solidarity and empowerment into economic analysis. Many other possibilities are conceivable.

structed empirical indexes of solidarity and agency. We have shown that these indexes were quite distinct from the conventional determinants of well-being—GDP per capita, inequality, and environmental sustainability—both in their movement through time and their variation across countries.

Furthermore, we have presented preliminary evidence of "decoupling" of economic and social prosperity, by showing that the correlation (1) between solidarity and GDP per capita and (2) between agency and GDP per capita have both fallen with the passage of time in many countries over the past decade.

In conclusion, it is worth emphasizing that our empirical analysis—like our theoretical analysis—is meant to represent merely a beginning of a research program. Much more research is required to investigate theories whereby solidarity and agency influence economic activity and generate well-being. Similarly, the empirical indexes of solidarity and agency/empowerment will need much further elaboration and refinement, bringing more determinants of solidarity and agency into our purview.

Once the theoretical and empirical analyses have matured, it will be important to reassess the implications for government and for business. Our indexes of solidarity and agency/empowerment could serve as a first step toward a wider assessment of how government policy and business decisions affect human well-being. Currently, government policy measures are evaluated primarily on the basis of their return in terms of GDP (with occasional adjustments for income distribution and environmental impacts). In the same vein, business decisions on production, employment, and investment are made primarily in terms of shareholder value.

Starting from the presumption that the purpose of government and business is to promote the public interest, centered on human well-being in thriving societies, our analysis suggests that the evaluations of government and business decisions should include assessments of their impacts on solidarity and agency. Having argued that solidarity and agency are quite distinct from GDP (and its business counterpart, shareholder value) as sources of well-being, it seems inadvisable to include these various sources in one index of well-being. Instead, it appears preferable for GDP, environmental sustainability, solidarity, and agency to be elements in an evaluative dashboard, for which decision-makers are required to meet performance standards regarding each of the elements.

However, in order to promote humancentric reforms of government policy and business practice, changes in evaluation and reporting of impact effects must be a prelude to a broad systemic change, involving reforms of our laws, institutions, and social norms. In short, our analysis is merely a preliminary step towards reinventing our governance systems with the aim of recoupling economic and social prosperity.

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Appendix

Indicators: Methodology, Definitions, and Sources

Collection and variables selection

The data used to calculate the two indexes is exclusively provided by external sources. The data come from international sources such as the OECD, the World Bank, and data projects (e.g., CAF).

As is frequent with data projects, some of the variables included have a degree of missing data. To ensure continuity and comparability between composite scores over time, it is necessary to estimate values for these years. Missing data can be located in the interior of the available time series or at the exterior. For the former, the linear interpolation method is used – values are replaced with numbers incrementally higher or lower than the neighboring data points. For the latter, the missing values are replaced using the closest data point from source (last value carried forward – LVCF – or first value carried backward – FVCB).

Data collected to compute the indexes are diverse. At source, the variables collected are produced on different scales, and can also have different polarities – higher is better, or higher is worse. In order for them to be meaningfully combined and compared, raw data are standardized before being included in the indexes. We employ a min-max normalization whereby all raw data are transformed to a scale of 0.0–1.0 (where a score of 1.0 is the best score a country can achieve). While this constitutes an order-preserving linear transformation of the data, a score of 1.0 after normalization does not imply that a country's score in raw data terms is perfect, but rather that it is the best score in the set of countries.

We use linear, additive aggregation and weigh each subcomponent equally within its dimension.

Data Sources Social Solidarity Index

1	World Giving Index (CAF)	This index relies on a simple averaging of three giving behaviors: helping a stranger, donating money, volunteering time. Each country is given a percentage score, and countries are ranked on the basis of these scores. The index measures countries by proportion of population giving.
2	Trust (WVS/EVS)	Trust is based on the question: Generally speaking, would you say that most people can be trusted or that you need to be careful in dealing with people? Data comes from the World Values Survey and the European Values Survey.
3	Social Support (OECD)	Percentage of people who report that they have friends or relatives whom they can count on in times of trouble. Data comes from the Gallup World Poll and is extracted from OECD "How's Life" S.169f.

Data Sources Agency/Empowerment Index

1	Labour market insecurity (OECD)	This indicator is defined in terms of the expected earnings loss, measured as the percentage of the previous earnings, associated with unemployment. This loss depends on the risk of becoming unemployed, the expected duration of unemployment, and the degree of mitigation against these losses provided by government transfers to the unemployed (effective insurance).
2	Vulnerable employment (World Bank)	Vulnerable employment is contributing family workers and own-account workers as a percentage of total employment.
3	Life expectancy (OECD)	Life expectancy measures how long on average people could expect to live based on the age-specific death rates currently prevailing. This measure refers to people born today and is computed as a weighted average of life expectancy for men and women.
4	Years in education (UNESCO)	Mean years of schooling provides the average number of years of education (primary/ISCED 1 or higher) completed by a country's adult population (25 years and older), excluding years spent repeating grades.
5	Confidence in empowering institutions (OECD/Gallup World Poll)	Confidence in empowering institutions is based on the question: In this country, do you have confidence in each of the following, or not? How about national government? The percentage of "yes" answers is reflected here. Data comes from the Gallup World Poll and is extracted from the OECD Trust Dataset (www.oecd.org/OECD-Trust-Dataset.xlsx).

Further Data Sources

1	GDP per capita, PPP (current int. $)	GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the US dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current international dollars based on the 2011 ICP round. Source: World Bank, International Comparison Program database.
	GDP per capita (constant 2010 US$)	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 US dollars. Source: World Bank national accounts data, and OECD National Accounts data files.
2	Gini index	Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality. Source: World Bank.
3	Environmental Performance Index (EPI)	The Environmental Performance Index (EPI) ranks countries on 24 performance indicators across 10 issue categories covering environmental health and ecosystem vitality. Source: Wendling et al. (2018).

Index Scores

Table 1: Empowerment, solidarity, material prosperity, and environmental sustainability scores in 2007

Country	Emp I rank	Empowerment index	SI rank	Solidarity index	GDP per capita	Gini index	Environment index
Australia	11	0.80	3	0.80	$51,024	34.82	79.80
Austria	15	0.77	14	0.65	$47,510	30.60	89.40
Belgium	10	0.81	18	0.55	$44,961	29.20	78.40
Brazil	32	0.47	27	0.34	$10,294	54.90	82.70
Canada	4	0.87	8	0.76	$48,537	33.80	86.60
Chile	27	0.62	30	0.33	$12,256	48.47	83.40
China	34	0.41	29	0.33	$3,480	42.30	65.10
Czech Republic	21	0.71	24	0.43	$20,151	26.00	76.80
Denmark	8	0.84	1	0.83	$61,175	26.20	84.00
Finland	3	0.87	11	0.72	$49,239	28.30	91.40
France	18	0.74	22	0.46	$41,583	32.40	87.80
Germany	12	0.80	15	0.63	$41,832	31.30	86.30
Greece	26	0.65	33	0.22	$30,055	34.00	80.20
Hungary	25	0.65	25	0.40	$13,732	27.90	84.20
Iceland	17	0.74	7	0.76	$47,835	29.50	87.60
India	35	0.12	34	0.19	$1,174	35.00	60.30
Ireland	13	0.79	9	0.75	$54,708	31.90	82.70
Israel	23	0.69	17	0.57	$29,646	41.00	79.60
Italy	24	0.65	19	0.54	$38,237	32.90	84.20
Japan	19	0.73	20	0.48	$45,687		84.50
Luxembourg	1	0.90	16	0.60	$111,968	31.10	83.10
Mexico	30	0.59	26	0.38	$9,622	49.40	79.80
Netherlands	6	0.85	5	0.77	$51,809	29.60	78.70
New Zealand	7	0.85	2	0.80	$34,600		88.90
Norway	5	0.87	4	0.79	$91,617	27.10	93.10
Poland	28	0.62	23	0.43	$11,322	34.00	80.50
Portugal	29	0.60	28	0.34	$22,817	36.70	85.80
Russian Federation	22	0.70	31	0.32	$10,535	42.30	83.90
South Africa	33	0.45	32	0.27	$7,299	63.60	69.00
Spain	20	0.72	21	0.47	$32,460	34.10	83.10
Sweden	9	0.83	12	0.71	$53,484	27.10	93.10
Switzerland	2	0.88	6	0.76	$75,144	34.30	95.50
Turkey	31	0.52	35	0.15	$10,640	38.40	75.90
United Kingdom	16	0.76	13	0.70	$41,214	35.70	86.30
United States	14	0.78	10	0.73	$49,856	41.10	81.00

Note: The economic empowerment index includes labor market insecurity, vulnerable employment, life expectancy, years in education, and confidence in empowering institutions. Due to missing data, the empowerment scores for Brazil, China, India, Russia, and South Africa include only the variables vulnerable employment, life expectancy, and years in education. They should therefore be interpreted with caution. The social solidarity index includes giving behavior, trust, and social support. Due to missing data, the solidarity scores for China and India do not include social support; for Israel, trust is missing. They should therefore be interpreted with caution. The two indexes are based on own calculations. For comparison, GDP per capita (in constant US$ based 2010), Gini index of income, and the Environmental Performance Index (EPI) are included in the table. The methodology and official definitions and sources of all variables used can be found in the appendix.

Table 2: Empowerment, solidarity, material prosperity, and environmental sustainability scores in 2017

Country	Emp I rank	Empowerment index	SI rank	Solidarity index	GDP per capita	Gini index	Environment index
Australia	15	0.82	4	0.80	$56,229	36.63	87.22
Austria	16	0.81	15	0.64	$49,190	30.50	86.64
Belgium	18	0.80	18	0.56	$46,211	26.90	80.15
Brazil	31	0.56	27	0.37	$10,990	53.30	78.90
Canada	4	0.89	9	0.74	$51,151	34.53	85.06
Chile	26	0.64	29	0.35	$14,749	46.60	77.67
China	34	0.50	21	0.48	$7,308	37.40	65.10
Czech Republic	19	0.80	30	0.34	$22,755	25.90	84.67
Denmark	10	0.84	2	0.84	$62,357	27.80	89.21
Finland	7	0.84	6	0.78	$47,740	27.70	90.68
France	22	0.75	23	0.45	$43,002	33.50	88.20
Germany	2	0.91	12	0.66	$46,988	32.30	84.26
Greece	32	0.55	32	0.28	$23,053	36.40	85.81
Hungary	23	0.72	31	0.33	$15,696	29.40	84.60
Iceland	8	0.84	3	0.82	$51,282	35.00	90.51
India	35	0.19	34	0.26	$1,987	36.60	53.58
Ireland	12	0.82	8	0.74	$71,756	31.60	86.60
Israel	17	0.80	20	0.55	$34,333	38.45	78.14
Italy	25	0.64	22	0.47	$35,029	36.80	84.48
Japan	14	0.82	24	0.45	$48,439		80.59
Luxembourg	3	0.90	17	0.57	$106,520	39.00	86.58
Mexico	30	0.57	35	0.22	$10,298	48.10	73.59
Netherlands	9	0.84	7	0.74	$53,942	27.40	82.03
New Zealand	6	0.85	1	0.85	$37,678		88.00
Norway	5	0.87	5	0.80	$91,451	28.90	86.90
Poland	24	0.69	25	0.40	$15,826	29.80	81.26
Portugal	27	0.62	28	0.36	$23,197	35.30	88.63
Russian Federation	21	0.76	26	0.37	$11,470	33.30	83.52
South Africa	29	0.60	19	0.56	$7,483	62.70	70.52
Spain	28	0.62	16	0.60	$32,403	36.40	88.91
Sweden	11	0.83	10	0.73	$56,611	30.80	90.43
Switzerland	1	0.95	11	0.72	$77,452	31.90	86.93
Turkey	33	0.53	33	0.27	$14,871	40.90	67.68
United Kingdom	13	0.82	14	0.64	$42,670	31.60	87.38
United States	20	0.79	13	0.65	$53,356	41.67	84.72

Note: The economic empowerment index includes labor market insecurity, vulnerable employment, life expectancy, years in education, and confidence in empowering institutions. Due to missing data, the empowerment scores for Brazil, China, India, Russia, and South Africa include only the variables vulnerable employment, life expectancy, and years in education. They should therefore be interpreted with caution. The social solidarity index includes giving behavior, trust, and social support. Due to missing data, the solidarity scores for China and India do not include social support; for Israel, trust is missing. They should therefore be interpreted with caution. The two indexes are based on own calculations. For comparison, GDP per capita (in constant US$ based 2010), Gini index of income, and the Environmental Performance Index (EPI) are included in the table. The methodology and official definitions and sources of all variables used can be found in the appendix.