PROSPERITY INDEX

www.li.com
www.prosperity.com

The Legatum Prosperity Index™ 2019

Methodology Report

A tool for transformation

Contents

Introduction

Our mission at the Legatum Institute is to create the pathways from poverty to prosperity, by focussing on understanding how prosperity is created and perpetuated. Prosperity entails much more than wealth: it reaches beyond the financial into the political, the judicial, and the wellbeing and character of a nation – it is about creating an environment where a person is able to reach their full potential. A nation is prosperous when it has effective institutions, an open economy, and empowered people who are healthy, educated, and safe.

The measurement of national prosperity is an important task for governments and for those who hold them to account. It is the real measure of whether a nation is truly fulfilling the potential of its people, in terms of both their productive capacity and their collective wellbeing. Our ambition for the Index is that it becomes a tool for leaders around the world to help set their agendas for growth and development. By identifying success, we can enable national and local governments, businesses, civil society, and philanthropists to identify what works, adopt best practices, and also enable others to hold them to account.

Our aim in publishing this methodology report is to provide all the information required to understand the Legatum Prosperity Index and to present it in a way that is transparent, useful, and informative.

This report describes the methodology underpinning the Legatum Prosperity Index, through four parts. Part I defines prosperity, using knowledge built up over the 13 years of measuring and studying prosperity. Part II addresses and explains moving from definition to measurement, how indicators have been selected to fit the prosperity framework, and the process of going from these indicators to an overall measure of prosperity. Part III assesses the Prosperity Index, exploring the statistical properties of the Index, and the tests undertaken. Part IV highlights the changes made to the 2019 Prosperity Index, following a 12-month review and refinement, undertaken with over 100 experts from around the world, and the impact of those changes on the findings from the Index.

Part I
Defining prosperity

What is prosperity?

Over 13 years of measuring and understanding prosperity, it has become evident that the multidimensional nature of true prosperity must be clearly articulated. True prosperity is more than just material wealth. Prosperity entails much more than wealth: it reaches beyond the financial into the political, the judicial, and the wellbeing and character of a nation — it is about creating an environment where a person is able to reach their full potential.

The following section outlines the definition of prosperity that underpins the Legatum Prosperity Index, describing its core components and structures.

The domains of prosperity

Prosperity is multifaceted and cannot be defined by simple linear measures. It is a multidimensional concept, which the Prosperity Index seeks to measure, explore, and understand as fully as possible. The framework of the Index captures prosperity through three domains, which are the essential foundations of prosperity — Inclusive Societies, Open Economies, and Empowered People.

The **Inclusive Societies** domain captures the relationship structures that exist within a society, between and among individuals and broader institutions, and the degree they either enable or obstruct societal cohesion and collective development. These social and legal institutions are essential in protecting the fundamental freedoms of individuals, and their ability to flourish. This domain consists of the Safety and Security, Personal Freedom, Governance, and Social Capital pillars.

The **Open Economies** domain captures the extent to which an economy is open to competition, encourages innovation and investment, promotes business and trade, and facilitates inclusive growth. For a society to be truly prosperous, it requires an economy that embodies these ideals. This domain consists of the Investment Environment, Enterprise Conditions, Market Access and Infrastructure, and Economic Quality pillars.

The **Empowered People** domain captures the quality of people's lived experience and the associated aspects that enable individuals to reach their full potential through autonomy and self-determination. This domain consists of the Living Conditions, Health, Education and Natural Environment pillars.

Together, these domains comprise 12 equally-weighted pillars. It is important to note that the pillars within each domain do not only associate with other pillars in the domain, but interrelate with pillars across the other domains, and each pillar should therefore be understood in the wider context of the Index. For example, the Living Conditions pillar looks at the set of basic material conditions present in everyday life that provide the platform for members of society to attain prosperity and wellbeing. Other necessities for wellbeing, such as health, education, and freedom from coercion, are captured in other pillars.

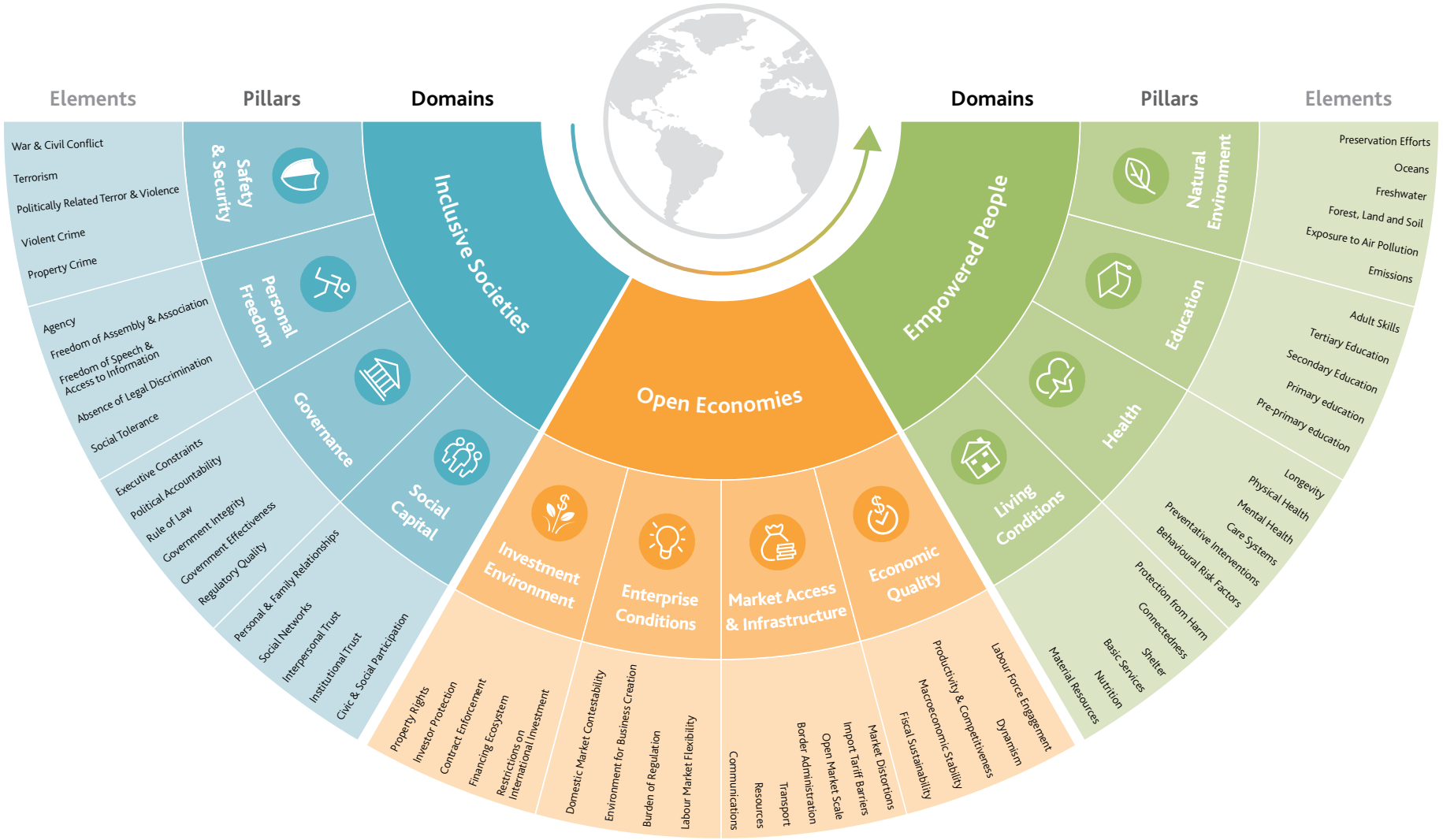
For each of the 12 pillars within the three domains, we identified the core distinct concepts that best define them, and are integral to each of them, comprising a structure which:

- Covers all aspects relevant to the pillar;
- Has conceptual clarity and academic backing;
- Uses a language that speaks to policymakers.

The result is a set of 65 distinct policy-focussed elements, organised under the 12 pillars. Each element has been designed to reflect a discrete policy area that policymakers and others can influence, enabling actionable insight to be generated from the Index to help drive policy and other initiatives.

An infographic that sets out the construction of the 2019 Prosperity Index, and the linking of the 3 domains, 12 pillars, and 65 elements is illustrated on the next page. The pages that follow give clarity and greater detail to the definition of each of the domains, pillars, and elements underpinning this structure.

Figure 1: The domains, pillars, and elements of prosperity



Inclusive Societies

Inclusive Societies are an essential requirement for prosperity, where social and legal institutions protect the fundamental freedoms of individuals, and their ability to flourish. This domain explores the relationship structures that exist within a society, and the degree they either enable or obstruct societal cohesion and collective development.

Areas within this domain range from the relationship of citizen and state, to the degree to which violence permeates societal norms, to the interaction of freedoms of different groups and individuals, to the way in which individuals act with one another, their community, institutions, and nation. These issues have been both a practical consideration for the majority of modern human experience, as well as a subject of academic study.[1,2,3]

We examine the fundamental aspects of inclusive societies across four pillars, each with component elements.

Safety and Security captures the degree to which individuals and communities are free from war and civil conflict, terrorism, politically related terror and violence, violent crime, and property crime.

Personal Freedom reflects basic legal rights (agency), individual liberties (freedom of assembly and association, freedom of speech and access to information), the absence of legal discrimination and the degree of social tolerance experienced in a society.

Governance encompasses the extent to which there are checks and restraints on power, and whether governments operate effectively and without corruption.

Social Capital captures the personal and family relationships, social networks and the cohesion a society experiences when there is high institutional trust, and people respect and engage with one another (civic and social participation).

The following pages provide a more detailed definition for each of these pillars, and an overview of their relationship to prosperity.

1. Locke, John. Two Treatises of Government: With a Supplement, Patriarcha, by Robert Filmer. No. 2. *Simon and Schuster*, 1947.
2. Galtung, Johan. "Violence, peace, and peace research." *Journal of peace research* 6, no. 3 (1969): 167-191.
3. De Tocqueville, Alexis. Democracy in America. Vol. 10. *Regnery Publishing*, 2003.

Safety and Security

The presence or absence of violent and other criminal activities determines how safe and secure the population is. The lives of individuals and the security of their property are at risk in a society where these activities are present, both through their current prevalence and long-lasting effects. In short, a nation, community, or society can prosper only in an environment that provides safety and security to its citizens.

War and civil conflicts are great destabilisers of even the most basic levels of safety and security. When they subside, peace can be relatively short-lived, with previously conflict-stricken areas often relapsing into conflict within relatively short timeframes. In 2016, of the 259 conflicts identified by the Uppsala Conflict Data Programme, 159 recurred.[4] The effect that crime has on both economic growth and subjective wellbeing is widely explored in the literature. Crime impedes economic growth via the discouragement of investment and capital accumulation, through an undermining of property rights.[5]

Economies have two potentially stable equilibria, as described by Mehlum et al.; *"a) One where crime rates are high and capital stock, labor demand, and income is low. b) One where crime rates are low and capital stock, labor demand, and income is high."*[6] Endemic crime can result in an economy finding a so called 'poverty trap', where crime becomes the most effective means of individual gain, but acts as a break on real opportunity for development. Mehlum concludes by establishing the existence of the *"vicious circle of increasing crime and stagnation"*.[7]

In addition to the economic impacts, crime affects the wellbeing of individuals and communities in several ways. The impact of the trauma of crime on the direct victims and their loved ones can be profound and devastating, and Graham (2011) concluded that being a victim of crime always has a negative effect on happiness.[8] Scholars such as Cohen argue that crime has relatively little effect on the sum wellbeing of a community due to 'adaptation to adversity', where individuals effectively 'get used to' higher levels of crime, and the *'risk-fear paradox'* as coined by Farral, Gray, and Jackson shows that the direct relationship between crime and individual wellbeing is not straightforward; those who are more at risk of crime, and likely to exhibit and experience less fear.

In addition, the detriment to the wellbeing of people may be found through the indirect effects of crime. Crime may have even more acute effects on individual neighbourhoods, and the individuals who reside in or around them. High levels of crime, lawlessness, or gang activity can create 'no-go' areas through which residents and locals don't move that can discourage individual opportunity via the prevention of travel for work or other purposes, and have distinct effects on individual wellbeing, undermining the governance of a nation.[9]

For a society or community to be truly safe and secure, there must be an absence of both domestic and national security risks. The effects of war, civil conflict, and terrorism can be pervasive. The damage done by such events reaches far beyond the event itself; communities must rebuild themselves, cope with grief, and address psychological traumas arising from the atmosphere created. For this reason, the Terrorism element, and the War and Civil Conflict element capture the extent to which such events have destabilised societies over the past five years.

Elements of Safety and Security

1. **War and Civil Conflict** – the impact of organised conflicts affecting a country, both internal and external, on people, in terms of deaths, injuries, intensity of conflict, and human displacement.
2. **Terrorism** – the deliberate and targeted harm inflicted by non-state actors on a nation's population, taking into account the number of incidents, injuries, and deaths that result. The costs of attacks on business are also taken into consideration.
3. **Politically Related Terror and Violence** – the extent to which people live in fear of, or suffer from, terror and violence inflicted by the state or other political bodies. Extrajudicial killings, unlawful disappearances, torture, and political imprisonment are all ways in which terror and violence are applied for political means.
4. **Violent Crime** – the level to which violent domestic crime affects the citizens of a country. Whilst the availability of reliable data is a constraint on the accurate measurement of the levels of violent crime, homicides, rape, and the degree to which violence is resorted to are all significant areas in which violent crime can impact the security of individuals and communities.
5. **Property Crime** – the level to which property crime, such as burglary, organised crime, or the impact of crime on business, destabilises the security of individuals and affects both the wealth and wellbeing of individuals.

4. Gates, Scott, Håvard Mokleiv Nygård, and Esther Trappeniers. "Conflict recurrence." *Conflict Trends* 2 (2016): 1-4.
5. Josten, Stefan Dietrich. "Inequality, crime and economic growth. A classical argument for distributional equality." *International Tax and Public Finance* 10, no. 4 (2003): 435-452.
6. Mehlum, Halvor, Karl Moene, and Ragnar Torvik. "Institutions and the resource curse." *The economic journal* 116, no. 508 (2006): 1-20.
7. Ibid.
8. Graham, Carol. "Adaptation amidst prosperity and adversity: Insights from happiness studies from around the world." *The World Bank Research Observer* 26, no. 1 (2010): 105-137.
9. Wilson, Ronald E., Timothy H. Brown, and Beth Schuster. "Preventing neighborhood crime: Geography matters." *NIJ Journal* 263 (2009): 30-35.

Personal Freedom

The Personal Freedom pillar captures the extent of basic legal rights, individual liberties, and social tolerance in a nation. Our definition of freedom takes root in the school of thought that has permeated modern liberal thinking for the past few centuries, grounded in John Locke's assertion that freedom implies an individual not *"be subject to the arbitrary will of another, but freely follow his own."*[10] Isiah Berlin articulated the concept of freedom that underpins the personal freedom as *'negative liberty'* (the concept of non-interference by others), whereas *'positive liberty'*, which is the removal of impediments to one's fulfilment or potential, is not a consideration of our measurement.[11]

When freedom is restricted, it becomes more difficult for people to live their lives in the ways that they choose. Freedom is important because it underpins personal flourishing, enabling people to pursue their ambitions and follow their own paths in life. With freedom also comes responsibility for actions. When individuals are responsible for their own actions, and free to test new ideas and ways of acting, they can learn from mistakes and all can benefit from the innovations. Societies that foster strong civil rights and freedoms have been shown to enjoy increased levels of both happiness and life satisfaction among their residents, with the satisfaction effect being more pronounced in more developed countries.[12,13,14] The concepts covered within the pillar are considered protected by the majority of countries signatures on international human rights treaties.

A society benefits from higher levels of income when its residents' personal liberties are protected and when it is welcoming of the social diversity that stimulates innovation. There are four pathways through which human freedom can spur economic growth: reduced economic inequality, human development, effective institutions and governance, and the absence of conflict and political instability.[15]

The relationship between free societies and economic progress is questioned more often today, due to the successful development of authoritarian nations such as China or Singapore. There seem to be many paths to development through an economic lens, but Sen argues that human rights are not the primary end of development, but among the principle means; he argues they constitute a necessary condition for income and growth.[16] Civil and political freedoms such as freedom of speech and elections help promote economic security. Uncertainty associated with lack of respect for human rights makes the return on investment more insecure and volatile. This suggests that disregarding human rights may lead to lower investment rates, lower productivity, and lower growth.

The definition of personal freedom can be separated into those elements that capture freedom for the population as a whole to act in all its forms (including freedom of movement, assembly and association, and speech), and elements that impact specific subsets of the population, whether through *de jure* discrimination or the *de facto* experience of freedom and tolerance.

Elements of Personal Freedom

1. **Agency** – the degree to which individuals are free from coercion or restriction and are free to move. At its heart, an individual experiences agency if they have the freedom to act independently and make their own free choices. Forced bondage and slavery, unlawful imprisonment, restrictions on movement, and numerous other factors can act as impediments on agency.
2. **Freedom of Assembly and Association** – the degree to which people have the freedom to assemble with others in public spaces to express opinions freely, with autonomy from the state, and to form collective interest organisations.
3. **Freedom of Speech and Access to Information** – the ability of people to express political opinion without reproach and the extent to which the media is censored and is independent from and not influenced by the ruling government. The diversity of media views and access to media are also crucial factors underpinning the freedom of speech and access to information.
4. **Absence of Legal Discrimination** – the level of discrimination in law or by government and whether the law protects individuals and groups from suffering discrimination. This dimension captures multiple factors, including gender, sexuality, religion, ethnicity, and economic background, as well as the degree to which courts and civil justice hold overt or covert bias and discrimination.
5. **Social Tolerance** – the extent to which societies are tolerant of differences within the population, and the level of tension arising over these differences. Societal discrimination and intolerance can engender serious issues within a society, and are a significant inhibitor of an individual's *de facto* freedoms.

10. Locke, John. Two Treatises of Government: With a Supplement, Patriarcha, by Robert Filmer. No. 2. *Simon and Schuster*, 1947.
11. Berlin, Isaiah. "Two concepts of liberty." *In Liberty Reader*, pp. 33-57. Routledge, 2017.
12. Veenhoven, Ruut. "Social conditions for human happiness: A review of research." *International Journal of Psychology* 50, no. 5 (2015): 379-391.
13. Inglehart, Ronald, Roberto Foa, Christopher Peterson, and Christian Welzel. "Development, freedom, and rising happiness: A global perspective (1981–2007)." *Perspectives on psychological science* 3, no. 4 (2008): 264-285.
14. Verme, Paolo. "Happiness, freedom and control." *Journal of Economic Behavior & Organization* 71, no. 2 (2009): 146-161.
15. Marslev, K. & Sano, H-O. (2016). "The Economy of Human Rights. Exploring Potential Linkages between Human Rights and Economic Development". *Matters of Concern, the Danish Institute for Human Rights,* 2016.
16. Sen, Amartya. "Development as Freedom (New York: Anchor)." *South Indian ICT Clusters* 227 (1999).

Governance

A stable and trustworthy state is one of the central components of economic exchange. The more culturally embedded the rule of law and good governance becomes, the more effective these measures are in promoting and supporting a healthy economic environment. Governance is at its most robust when it has been established over time through natural evolution and is essentially a codification of cultural expectations and behaviours.[17]

The importance of strong governmental institutions to long-run economic growth cannot be overstated; it has been shown that institutional capacity is more important to long-term success than discrete policy choices.[18] Even when controlling for extraneous factors such as culture, there is evidence that economic institutions are one of the main determinants in differences in economic prosperity, and that these effects can last for centuries.[19] Replications of these findings have shown that institutions are more important to long-run growth than either trading or geographic factors.[20]

Economic progress is not possible without the firm foundation of the rule of law. The absence of the rule of law will result in depressed domestic and foreign investment, and cronyism in the business environment, leading people to rely primarily on personal networks and patronage rather than the strength of their own ideas. The rule of law has also been linked to important improvements in personal freedoms.[21] Improvements in governance have a dramatic effect on raising overall economic prosperity. A recent study has shown that a shift to democracy leads to a 20% increase in GDP per capita in the long run.[22] However, once an effective base of trustworthy governance has been achieved, the effects of further improvements to governance are subject to diminishing returns.

The minimisation of corruption is also critical to the functioning of a society. High levels of corruption are associated with higher levels of poverty and income inequality.[23] Corruption will corrode trust, which is critical to ensuring an environment where frictionless (or near-frictionless) transactions can take place. A culture of trust invariably takes time to become established. These attributes are more valuable if good behaviours, such as trust, respect, and diligence are embedded in a culture rather than imposed from some outside force as part of a treaty or international agreement.

Governance can be conceptually split between the structural and operational aspects of how political and administrative power is checked, and how it is applied. The structural aspects capture how a government and political administration adhere to the law, the extent to which there is effective separation of powers, accountability to the public, and the rule of law. The operational aspects capture the integrity and effectiveness of a government, as well as the quality of its regulations, examining how power is applied.

Elements of Governance

1. **Executive Constraints** – the level of checks and balances, and separation of powers – especially with respect to the executive. For effective executive constraints to be in place, a government must not only have checks and balances and separation of powers, but be free from military involvement, and effective sanctions must be in place for misconduct within office.
2. **Political Accountability** – the degree to which the public can hold public institutions accountable, capturing the degree of political pluralism, and other mechanisms of accountability.
3. **Rule of Law** – the fairness, independence, and effectiveness of the judiciary (in applying both civil and criminal law), along with the degree to which every citizen is subject to the law.
4. **Government Integrity** – the integrity of a government, encompassing both the absence of corruption, and the degree to which government fosters citizen participation and engagement through open information and transparent practices.
5. **Government Effectiveness** – a combination of the quality of public service provision, the quality of the bureaucracy, and the competence of officials.
6. **Regulatory Quality** – all aspects of the running of the regulatory state – whether it is burdensome and impedes private sector development, and whether it is smoothly and efficiently run.

17. Adkisson, Richard V., and Randy McFerrin. "Culture and good governance: A brief empirical exercise." *Journal of Economic Issues* 48, no. 2 (2014): 441-450.
18. Douglass C. North. *Institutions, institutional change, and economic performance* (Cambridge: Cambridge University Press, 1990).
19. Acemoglu, Daron, and James Robinson. "The role of institutions in growth and development." *Leadership and Growth* 135 (2010).
20. Rodrik, Dani, Arvind Subramanian, and Francesco Trebbi. "Institutions rule: The primacy of institutions over geography and integration in economic development." *Journal of Economic Growth* 9, no. 2 (2004): 131-165.
21. Acemoglu, Daron, Suresh Naidu, Pascual Restrepo, and James A. Robinson. "Democracy does cause growth." *Journal of Political Economy* 127, no. 1 (2019): 47-100.
22. Vásquez, Ian, and Tanja Porčnik. *The human freedom index: A global measurement of personal, civil, and economic freedom* (Washington, D.C.: The Cato Institute, 2018).
23. Gupta, Sanjeev, Hamid Davoodi, and Rosa Alonso-Terme. "Does corruption affect income inequality and poverty?" *Economics of Governance* 3, no. 1 (2002): 23-45.

Social Capital

Social capital represents the networks and the cohesion a society experiences when people trust and respect one another. Loosely, social capital refers to the factors of effectively functioning social groups, encompassing interpersonal relationships, a shared sense of identity, norms, values, trust, co-operation, and reciprocity, but there is no clear consensus on its exact definition. It can be considered as social organisation facilitating the achievement of goals that could not be achieved in its absence, or could be achieved only at a higher cost; in other words, it is the existence of a certain set of informal rules or norms shared among members of a group that permits cooperation among them.[24,25] Alternatively, it has also been described as the connections among individuals – social networks – and the norms of reciprocity and trustworthiness that arise from them.[26]

A person's wellbeing is best provided for in a society where people trust one another and have the support of their friends and family, and societies with lower levels of trust tend to experience lower levels of economic growth. Thus, the word 'capital' in 'social capital' highlights the contribution of social networks as an asset that produces economic returns and improves wellbeing. For example, it has been argued that Northern Italy developed faster than Southern Italy, because the former was better endowed with social capital - measured by membership in groups and clubs.[27]

The link between social capital and wellbeing in forms from health and education to political participation and good governance has been widely explored.[28,29] The process by which it operates has been described as follows: (1) social capital generates positive externalities for members of a group; (2) these externalities are achieved through shared trust, norms, and values, and their consequent effects on expectations and behaviour; (3) shared trust, norms, and values arise from informal forms of organisations based on social networks and associations.[30]

In general, higher trust environments correlate with higher life satisfaction, subjective wellbeing, and health, and that the frequency of interaction with friends and neighbours has a strong correlation with higher assessments of subjective wellbeing and health.[31]

The networks of social capital can operate on a range of different dimensions – with different effects. Hence, we measure a range of elements of social capital, ranging from relationships with family and close personal friends, to social networks, and generalised trust. We also consider institutional trust, and civic and social participation.

Elements of Social Capital

1. **Personal and Family Relationships** – the strength of the closest-knit personal relationships and family ties. These relationships form the core structure that individuals can turn to for support emotionally, mentally, and financially on a daily basis.
2. **Social Networks** – the strength of, and opportunities provided by, ties that an individual has with people in their wider network. These ties are a vital part of social support, and these networks can bolster bridging capital when social and community networks straddle different strata within society. Local social networks depend on building and maintaining relationships with other individuals and families, including neighbours.
3. **Interpersonal Trust** – the amount of trust within a society, encompassing the degree to which people trust strangers and those outside their known social sphere.
4. **Institutional Trust** – the degree to which individuals trust their institutions. Trust in institutions is an important foundation upon which the legitimacy and stability of political systems are built, with the trust of numerous institutions essential for true institutional trust.
5. **Civic and Social Participation** – the amount to which people participate within a society, broadly split into the civic and social spheres.

24. Coleman, James S. "Rational organization." *Rationality and society* 2, no. 1 (1990): 94-105.
25. Fukuyama, Francis. "Francis Fukuyama Article on Social Capital: Global Trends and US Civil Society." (1997).
26. Putnam, Robert D. 2000. Bowling Alone : *The Collapse and Revival of American Community*. New York: Simon & Schuster.
27. Putnam, Robert D., Robert Leonardi, and Raffaella Y. Nanetti. *Making democracy work: Civic traditions in modern Italy*. Princeton university press, 1994.
28. Uphoff, Eleonora P., Kate E. Pickett, Baltica Cabieses, Neil Small, and John Wright. "A systematic review of the relationships between social capital and socioeconomic inequalities in health: a contribution to understanding the psychosocial pathway of health inequalities." *International journal for equity in health* 12, no. 1 (2013): 54.
29. Knowles, Stephen. *Is social capital part of the institutions continuum?* No. 05/11. CREDIT Research Paper, 2005.
30. Steven N. Durlauf, Marcel Fafchamps, 'SOCIAL CAPITAL' *NBER Working Paper* 10485, May 2004.
31. Helliwell, John F., and Robert D. Putnam. "The social context of well–being." *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* 359, no. 1449 (2004): 1435-1446.

Open Economies

Open Economies encourage innovation and investment, promote business and trade, and facilitate inclusive growth. This domain captures the extent to which the economies of each country embody these ideals.

Without an open, competitive economy, it is very challenging to create lasting social and economic wellbeing where individuals, communities, businesses, and nations are empowered to reach their full potential. Trade between countries, regions, and communities is fundamental to the advance of the innovation, knowledge transfer, and productivity that creates economic growth and prosperity. Research shows that open economies are more productive, with a clear correlation between increased openness over time and productivity growth.[32] In contrast, in an uncompetitive market, or one that is not designed to maximise welfare, growth stagnates and crony capitalism thrives, with knock-on impacts elsewhere in society.

One of the biggest opportunities for policymakers is to resist protectionism and cronyism, and to actively reinvigorate an agenda that embraces open and pro-competitive economies, both domestically and internationally, that attracts innovation, ideas, capital and talent. While most policymakers focus on the big fiscal and macroeconomic policy tools at their disposal, the microeconomic factors are sometimes overlooked, and their potential to drive openness and growth is underestimated. With a focus on these microeconomic factors, we examine the fundamental aspects of open economies across four pillars, each with component elements.

Investment Environment reflects the extent to which investments are protected adequately through the existence of property rights, investor protections, and contract enforcement. Also measured is the extent to which domestic and international capital (both debt and equity) is available for investment.

Enterprise Conditions encompasses how easy it is for businesses to start, compete, and expand. Contestable markets with low barriers to entry are important for businesses to innovate and develop new ideas. This is essential for a dynamic and enterprising economy, where regulation enables business and responds to the changing needs of society.

Market Access and Infrastructure captures the quality of the infrastructure that enables trade (communications, transport, and resources), and the inhibitors on the flow of goods and services between businesses.

Economic Quality considers how robust an economy is (fiscal sustainability, macroeconomic stability) as well as how an economy is equipped to generate wealth (productivity and competitiveness, dynamism). It also captures the degree of labour force engagement and the diversity of goods and services.

The following pages provide a more detailed definition for each of these pillars, and an overview of their relationship to prosperity.

32. "Global Index of Economic Openness", *Legatum Institute*, May 2019.

Investment Environment

Investment is critical for both developing and sustaining an economy. A strong investment environment will not only ensure that good commercial propositions are investable, but also that adequate capital of the right type is available for such investable propositions.[33]

A business proposition is made investable when the assets of the business are protected through property rights, the interests of the investors are protected, particularly in the context of insolvency, and commercial arrangements of the business can be upheld through courts of law. These protections are substitutions for trust, without which additional costs will be baked into the cost of doing business (for example, higher interest rates and provisions for the expropriation of capital).

For capital to be available for investable propositions, there needs to be a pool of savings and a range of intermediaries such as banks, stock exchanges, private equity, and venture capital. In addition, tapping into global markets for international investment is a helpful booster for the access of capital, and in addition, tends to bring with it management expertise and fresh ideas. Financial depth and complexity is robustly and positively correlated with economic growth.[34,35]

A well-functioning financial system is highly effective at mobilising savings and investments that support entrepreneurs and innovations that are vetted by their potential to improve productivity.[36]

The structural aspects of how to measure an investment environment reveal two overriding concerns. The first is whether or not an investment is effectively protected. If investors do not have secure property rights, investment is unlikely to be undertaken.[37] Thus, the importance of an effective system of investment protection and property rights.[38,39] Second, it is necessary to have a supporting infrastructure for that investment consisting of an effective financing ecosystem, contract administration, and an encouraging environment for international investment.[40]

The growth in the sophistication of financial markets over the last four decades has been considerable, and the appreciation of the role of capital in economic growth and prosperity has been growing.[41,42,43] As evidenced from studies in the United States, financial depth and sophistication have become more important than ever for the availability of venture capital, which provides critical early-stage funding to new companies.[44,45]

Elements of Investment Environment

1. **Property Rights** – how well property rights over land, assets and intellectual property are protected. In addition to the protection of these rights, there must be lawful, efficient, and effective systems in place to register and regulate property.
2. **Investor Protection** – the degree of investor protection, including the quality of corporate governance, minority shareholder rights, and strength of insolvency regimes.
3. **Contract Enforcement** – the efficacy and efficiency of a country's system to enforce the rights of a contract holder. In addition, alternative dispute resolution mechanisms must be accessible and efficient.
4. **Financing Ecosystem** – the availability of money for investment from sources such as banking and bank debt, to corporate debt and more sophisticated financial markets.
5. **Restrictions on International Investment** – the impact of policies that enhance or deter the volume and quality or type of international investment into a country.

33. Solow, Robert M. "A contribution to the theory of economic growth." *The Quarterly Journal of Economics* 70, no. 1 (1956): 65-94.
34. De Gregorio, Jose, and Pablo E. Guidotti. "Financial development and economic growth." *World Development* 23, no. 3 (1995): 433-448.
35. See for example: Levine, Ross. "Finance, growth and economic prosperity." *Macroeconomic Review* (2018): 82-88.
36. King, Robert G., and Ross Levine. "Finance, entrepreneurship and growth." *Journal of Monetary Economics* 32, no. 3 (1993): 513-542.
37. Djankov, Simeon, Caralee McLiesh, and Andrei Shleifer. "Private credit in 129 countries." *Journal of Financial Economics* 84, no. 2 (2007): 299-329.
38. Bhattacharyya, S., S. Slaughter, and S. May. "Legal regimes governing foreign direct investment (FDI) in host countries." *Advocates for International Development*, (2012).
39. Balas, Aron, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer. "The divergence of legal procedures." *American Economic Journal: Economic Policy* 1, no. 2 (2009): 138-62.
40. Stiglitz, Joseph E. "Financial markets and development." *Oxford Review of Economic Policy* 5, no. 4 (1989): 55-68
41. Anne O. Kreuger. "Financial markets and economic growth," *IMF*, September 28, 2006.
42. Fischer, Stanley. "The importance of financial markets in economic growth." (lecture given at International Derivatives and Financial Market Conference of the Brazilian Mercantile and Futures Exchange Conference, Brazil, August, 2003): 20-23.
43. Ross Levine. "Finance and growth: Theory and evidence," chap. 12 in *Handbook of economic growth*, ed. Philippe Aghion and Steven Durlauf, vol. 1 (Amsterdam: Elsevier, 2005): 865-934.
44. Maula, Markku, and Gordon Murray. "Corporate venture capital and the creation of US public companies: The impact of sources of venture capital on the performance of portfolio companies" in *Creating value: Winners in the new business environment* (Oxford: Blackwell Publishers, 2002): 164-187.
45. Manigart, Sophie, and Harry Sapienza. "Venture capital and growth" in *The Blackwell Handbook of Entrepreneurship* (Oxford: Blackwell Publishers, 2017): 240-258.

Enterprise Conditions

A healthy economy is a dynamic and competitive one, where regulation supports business, allowing and encouraging it to respond to the changing priorities of society. In contrast, an economy focussed on protecting incumbents will experience lacklustre growth and job creation. Entrepreneurial activity is one of the key drivers of long-term prosperity, and its importance will only grow as the pace of technological change increases and the number of people involved in that change rises. Given the pace of change inherent to the information age, a society's ability to react quickly to new firm and market-level opportunities is critical to its overall prosperity. This entrepreneurial behaviour is especially important for the employment market and tax revenues.

A country's regulatory structure underpins its enterprise conditions. Areas such as the domestic market contestability, the environment for business creation, and the burden of regulation need to encourage and support enterprise if entrepreneurial activity is to flourish. They are also important in determining how people interact with businesses in any given country.

Where these elements are not in good working order, it is difficult to encourage formal business activity. Taxation, for example, is a critical factor in deciding where and how businesses are structured. If it is not made both simple and reasonable, it will be avoided.[46] The same is true for construction-permitting processes; the majority of buildings in the developing world are constructed without any sort of permit at all, because the relevant regulations are made doubly expensive by corruption.

It is clear that overburdening businesses with tough-to-follow regulations does not necessarily discourage business activity; it discourages formalised business activity that can be monitored and taxed by the state, as people seek ways of circumventing burdensome regulation. Highly restricted labour markets will similarly discourage formal employment, opening workers up to instability and the potential for exploitation.[47]

The enabling conditions of enterprise can broadly be separated into those measures which promote entrepreneurship, and those that limit commercial development. These two groups of elements express the factors that might persuade or dissuade an individual from going into business in his or her country.

Elements of Enterprise Conditions

1. **Domestic Market Contestability** – how open the market is to new participants, versus protection of the incumbents. Market based competition and prevention mechanisms for monopolies are essential to true contestability in any domestic market, and this market cannot be dominated by just a few business groups in the first place.
2. **Environment for Business Creation** – the legislative and policy driven factors that encourage entrepreneurialism. The skill of the labour force is essential to the business creation environment, as is cluster development and the protections for, and ease of, starting new businesses.
3. **Burden of Regulation** – how much effort and time are required to comply with regulations, including tax regulations. Regulation can become burdensome due to the volume of regulations that businesses have to comply with, as well as the complexity of those regulations.
4. **Labour Market Flexibility** – how dynamic and flexible the workplace is for both employer and employee in terms of the flexibility of employment contracts including redundancy costs.

46. Mankiw, N. Gregory, Matthew Weinzierl, and Danny Yagan. "Optimal taxation in theory and practice." *Journal of Economic Perspectives* 23, no. 4 (2009): 147-74.
47. Radulescu, Roxana, and Martin Robson. "Does labour market flexibility matter for investment? A study of manufacturing in the OECD." *Applied Economics* 45, no. 5 (2013): 581-592.

Market Access and Infrastructure

Trade enables the movement of goods, services, ideas, capital, and people. The Market Access and Infrastructure pillar measures the quality of the infrastructure that enables trade (communications, resources, and transport), and the inhibiting factors that reduce or restrict the flow of commerce. Where markets have sufficient infrastructure and few barriers to the exchange of goods and services, trade can flourish. Such trade leads to more competitive and efficient markets, enabling new products and ideas to be tested, funded, and commercialised.[48,49]

Unencumbered trade is a vital component of prosperity, delivering benefits to producers, consumers, and society as a whole.[50] Producers with access to good transport and communications infrastructure, and whose products are not subject to market distortions, are more likely to succeed than those whose commercial activities are hampered by regulatory or *de facto* barriers. Consumers benefit from the increased competition that freer trade brings, which tends to improve quality, lower prices, and increase the variety of goods and services available. Finally, society itself tends to benefit from the ideas that flow from the free exchange of information across borders, a critical factor of long-run productivity growth.[51] A study of 16 OECD countries found a robust relationship between a country's degree of openness to trade and its total factor productivity; in those countries, trading links enhanced knowledge flows, which were responsible for 93% of total factor productivity growth.[52]

The infrastructure that enables trade and commerce to operate can be measured by assessing both the critical enablers of trade and also the inhibitors.

Trade enablers are the things that enhance and make trade in all its forms possible. Chief amongst these is communications, where information technology, flowing through a modern communications network, has become the very lifeblood of industry.[53] Economic production is impossible without the resources of energy and water. Transport, and the infrastructure upon which it operates, is obviously the great enabler of physical trade, but is also vital for services as it allows people to move to seek and build business opportunities. International trade can be enabled by an effective border administration system and open markets. We also look at open market scale, which is the access a country has to foreign markets.

In addition to the enablers of trade, we also look at the policies and procedures that inhibit trade: import tariff barriers and market distortions, including subsidies, taxes and price continuity as disrupters of fair competition. Protectionism, for example, stifles new ideas and practices, as policies seek to protect incumbents by putting up barriers to outside competition, and the result is typically inefficiency and stagnation with a downward spiral in innovation, growth, and prosperity.

Elements of Market Access and Infrastructure

- **Communications** – the means of communication and how widespread access to communication is. Infrastructure for communications must necessarily be in place for strong communications within a nation, as well as the actual take up and use of communications by the population.
- **Resources** – the quality, reliability, and affordability of the energy network within a country, as well as the access to, and use of, water resources.
- **Transport** – the ease and efficiency with which people and goods travel between and within countries. This is a measure of the quality, diversity and penetration of all forms of transport; air travel, shipping and seaport services, and road and rail infrastructure.
- **Border Administration** – the time and administrative cost of a country's customs procedures, alongside the efficiency of this process.
- **Open Market Scale** – the size of the market to which providers of goods and services have privileged access.
- **Import Tariff Barriers** – the fees associated with trading products and services across borders, raising an income for government and making foreign goods more expensive.
- **Market Distortions** – how competitive markets are disrupted by subsidies, taxes, and non-tariff barriers to trade. Evaluates the extent of market liberalisation of foreign trade, non-tariff barriers, and the distortive effects of taxes and subsidies.

48. Paul Krugman. "Scale economies, product differentiation, and the pattern of trade," *American Economic Review*, 70, no. 5, (1980): 950-959.
49. Stiglitz, Joseph E., and Avinash K. Dixit. "Monopolistic competition and optimum product diversity," *American Economic Review*, 67, no. 3 (1977): 297-308.
50. Frankel, Jeffrey A., and David H. Romer. "Does trade cause growth?" *American Economic Review* 89, no. 3 (1999): 379-399.
51. Edwards, Sebastian. "Openness, productivity and growth: what do we really know?" *The Economic Journal* 108, no. 447 (1998): 383-398.
52. Madsen, Jakob B. "Technology spillover through trade and TFP convergence: 135 years of evidence for the OECD countries." *Journal of International Economics* 72, no. 2 (2007): 464-480.
53. Farhadi, Maryam, Rahmah Ismail, and Masood Fooladi. "Information and communication technology use and economic growth." *PloS one* 7, no. 11 (2012): e48903.

Economic Quality

Economic Quality captures how well a nation's economy is equipped to generate wealth sustainably and with the full engagement of its workforce. A strong economy is dependent on the production of a diverse range of valuable goods and services and high labour force participation.

Trust in the economic system is underpinned by predictability, which is important for both consumers and businesses. People are better able to adapt to an unpleasant certainty than uncertainty, as shown in the aftermath of the financial crisis.[54] Volatility has also long been shown to negatively correlate with economic growth.[55,56,57]

The ability to produce valuable products, more so than producing the same product faster or at a lower cost, is also vital to economic growth. Acquiring new productive capabilities, thereby evolving a comparative advantage, is one of the cornerstones of economic growth – not just at the forefront of the technological frontier, but also in less-developed economies.[58,59] A dynamic economy means that more ideas are entering the market, with determinants of long-run productivity growth found to be human capital and research and development.[60]

Prosperity is inclusive; hence, everyone must have the opportunity to participate in the labour market, use and develop their skillset, and reach their productive potential. Not only is this important at the level of the individual, but it means that income inequality can be mitigated – this being a key determinant of happiness and subjective wellbeing.[61,62] In addition to the implications for social wellbeing, income inequality also has negative consequences for aggregate economic potential.[63,64]

For a country's economy to be of high quality, it must be robust to shocks, which is captured in the fiscal sustainability and macroeconomic stability elements. This measures both historical stability and the capability of a government to sustain its spending policies into the future. The capacity for value generation is a central aspect of the economy. Increases in the complexity of products, as well as in the efficiency with which they are produced, are central to long-run increases in growth, and captured within productivity and competitiveness. For this to happen, there must be a churn of businesses, with new, more productive firms entering the market, which underlies the concept of dynamism. Finally, growth of the economy must be inclusive, affording the opportunity for everyone in the nation to participate in the workforce to the fullest extent.

Elements of Economic Quality

1. **Fiscal Sustainability** – the ability of a government to sustain its current spending, tax, and other policies in the medium-to-long-term. For a government to achieve meaningful fiscal sustainability, the budget balance and debt of the government must be under control, and the country must be deemed as low risk by external investors and credit agencies.
2. **Macroeconomic Stability** – two key elements of the economy – the GDP per capita growth rate, and the volatility of the inflation rate.
3. **Productivity and Competitiveness** – the efficiency with which inputs can be converted into outputs and the level of diversification in the economy. Competition enhances productivity by forcing firms to innovate new ways to reduce cost and time constraints.
4. **Dynamism** – the churn of businesses – the number of new start-ups entering, and failed firms exiting, an economy.
5. **Labour Force Engagement** – the intersection of demography and the workforce, including the rates of unemployment and gender ratios. Participation in the labour force, the level of unemployment, and percentage of the workforce in waged and salaried roles underpin the degree of labour force engagement.

54. Graham, Carol. "Happy peasants and miserable millionaires: Happiness research, economics, and public policy," *VOX*, January 30, 2010.
55. Hnatkovska, Viktoria, and Norman Loayza. *Volatility and growth*. The World Bank, 2004.
56. Judson, Ruth, and Athanasios Orphanides. "Inflation, volatility and growth." *International Finance* 2, no. 1 (1999): 117-138.
57. Imbs, Jean. "Growth and volatility." *Journal of Monetary Economics* 54, no. 7 (2007): 1848-1862.
58. Ricardo Hausmann. "What are the challenges of economic growth?" *The Growth Lab*, 2015.
59. Hausmann, Ricardo, and Bailey Klinger. "The structure of the product space and the evolution of comparative advantage," *Center for International Development at Harvard University* 146 (2007).
60. Bronzini, Raffaello, and Paolo Piselli. "Determinants of long-run regional productivity with geographical spillovers: The role of R&D, human capital and public infrastructure," *Regional Science and Urban Economics* 39, 2 (2009): 187-199.
61. Jebb, Andrew T., Louis Tay, Ed Diener, and Shigehiro Oishi. "Happiness, income satiation and turning points around the world." *Nature Human Behaviour* 2, no. 1 (2018): 33.
62. Diener, Ed, and Louis Tay. "Subjective well-being and human welfare around the world as reflected in the Gallup World Poll." *International Journal of Psychology* 50, no. 2 (2015): 135-149.
63. Ferreira, Francisco HG. "Inequality and economic performance: a brief overview to theories of growth and distribution." *World Bank* (1999).
64. Stiglitz, Joseph E. "Inequality and economic growth." In *Rethinking Capitalism*, pp. 134-155. 2016.

Empowered People

Empowered People captures the quality of people's lived experience and the features present that enable individuals to reach their full potential through autonomy and self-determination.

This domain captures the necessary resources required for a basic level of wellbeing, ranging from access to material resources, to adequate nutrition, to basic health services and outcomes, to basic education access and quality, and to a safe and clean environment. Many of these issues are inter-related, and we find the strongest relationship between education and living conditions. Each of the pillars in this domain differentiate countries' performances on these fundamental measures of social wellbeing to distinguish where greater numbers of people are disadvantaged and less likely to achieve wellbeing.

We examine the fundamental aspects of empowered people across four pillars, each with component elements.

Living Conditions incorporates the set of conditions or circumstances that are necessary for all individuals to attain a basic level of wellbeing. This set of circumstances includes a level of material resources, adequate nutrition, and access to basic services and shelter. It also measures the level of connectedness of the population, and the extent to which they live in a safe living and working environment.

Health captures the basic healthcare services in a nation and the health outcomes of a population – including the quality of both mental health and physical health, each of which affects longevity. It also assesses the set of behavioural risk factors that affect the quality of the population's health, and the quality of the healthcare provision through the lenses of care systems and preventative interventions.

Education reflects the enrolment, outcomes, and quality of four stages of education (pre-primary, primary, secondary, and tertiary education) as well as the skills of the adult population.

Natural Environment encompasses the elements of the physical environment that have a direct impact on the ability of residents to flourish in their daily lives. The extent to which the ecosystems that provide resources for extraction (freshwater and forest, land and soil) are sustainably managed, and the extent of preservation efforts.

The following pages provide a more detailed definition for each of these pillars, and an overview of their relationship to prosperity.

Living Conditions

Living conditions are the set of basic material conditions present in everyday life that provide the platform for members of society to attain prosperity and wellbeing. If these basic materials are present, then poverty – along a multi-dimensional approach – will be avoided. This outcome is a good in itself, and furthermore provides individuals an opportunity to flourish in society.

Decent living conditions are necessary to meet the basic needs of a population, provide central capabilities, and achieve wellbeing. The basic needs approach, as developed by Doyal and Gough, argues that there are a set of basic universal needs, without which there will be a *"fundamental disablement in the pursuit of one's vision of the good"*.[65] The capabilities approach, as developed by Sen and Nussbaum, argues a person's capability to live a good life is defined in terms of the set of functions one is able to do and to which one has access.[66,67] Neither of these are possible without a set of adequate living conditions.

Adequate living conditions not only provide intrinsic worth, but also provide a platform for success. Ensuring basic needs are met is an effective way of maintaining health and furthering education, both of which are key components of human capital and have significant economic benefits to individuals and society. To be productive, individuals should have access to sufficient material resources to provide for themselves and their loved ones, have access to suitable accommodation that is connected to the necessary services, be free from illness or death caused by an unsafe living or working environment, have adequate nutrition and energy intake to be healthy and work effectively, and have sufficient resources to access jobs and technology.

Ensuring all members of society are connected to core activities and services allows individuals the opportunity to include themselves in cultural, economic, and social activities important for human flourishing.

Decent living conditions should address vulnerabilities in society, be they dealing with financial challenges, safety in the living and working environment, or food security.

Elements of Living Conditions

1. **Material Resources** – the proportion of individuals with income and wealth above the basic level required to survive and attain wellbeing, accounting also for the reliability of income and resilience against economic shocks.
2. **Nutrition** – the availability, adequacy, and diversity of food intake required for individuals to participate in society, ensure cognitive development, and avoid potentially long-term health impacts.
3. **Basic Services** – the access to, as well as the availability and quality of, the basic utility services necessary for human wellbeing. Electricity, water, and sanitation are key basic services that must be easily accessible.
4. **Shelter** – the availability and quality of accommodation, and the impact of the accommodation environment on the health of residents.
5. **Connectedness** – the extent to which individuals are able to engage each other, both digitally and physically. Within the digital aspect of connectedness, cell phones, bank accounts, and digital payments are considered. Within the physical aspect, roads and public transport must provide effective means of physical connectedness, and the physical connectedness of rural residing populations is of particular importance.
6. **Protection from Harm** – the safety of the environment that individuals live and work in. This includes accounting for injuries and accidental deaths from work-placed based activities and from natural disasters.

65. Len Doyal and Ian Gough. "A theory of human need," *Macmillan International Higher Education*, 1991.
66. Amartya Sen and John Muellbauer. "The standard of living," *Cambridge University Press*, 1988.
67. Martha C. Nussbaum. "Women and human development: The capabilities approach," Vol. 3. *Cambridge University Press*, 2001.

Health

Health has intrinsic worth, but it also has significant instrumental importance in facilitating wellbeing. Good health allows individuals to flourish and to lead more fulfilling lives than would otherwise be possible and it is shown to positively impact wellbeing. Ill-health can cause poor educational outcomes and can negatively affect productivity.

Health is included in the set of goods required for all individuals to attain wellbeing.[68] Several studies have shown the link between good health and wellbeing, with mental health showing a stronger relationship than physical health.[69] Conversely, ill-health has been shown to worsen life-satisfaction.[70]

Health, alongside education, is often considered a key component of human capital, contributing to economic growth. A healthier workforce is more productive as fewer sick days are taken, people are physically and mentally able to work for longer, and there is a greater chance of developing experience.[71] Better health leads to more creativity and innovation, while poor health (such as stress) can lead to a narrowed perspective and lower productivity. Poor health during childhood can affect educational outcomes through worsening cognitive ability, so improving childhood and infant health is of particular importance for productivity outcomes, though reducing the impact of diseases that affect those of working age is equally important.[72]

There are three conceptual ideas within the Health pillar. One element (Behavioural Risk Factors) captures behaviours that affect health outcomes. Two elements (Preventative Interventions and Care Systems) capture the effectiveness of the healthcare system, considering access and coverage to both preventative treatment and ongoing care and treatment. Three elements capture health outcomes (Longevity, Mental Health, and Physical Health), measuring the mortality of the population and the quality of the physical and mental health of the population.

Elements of Health

1. **Behavioural Risk Factors** – the set of lifestyle patterns moulded by a complex set of influences that increase the likelihood of developing disease, injury or illness, or of dying prematurely.
2. **Preventative Interventions** – the extent to which a health system actively prevents diseases, illnesses and other medical complications from occurring, to save many children and adults from an early death. Immunisations are a crucial method of preventative intervention, as is effective preventative care.
3. **Care Systems** – the ability of a health system to treat and cure diseases and illnesses, once they are present in the population. For care systems to be effective, a country must have effective healthcare coverage and facilities, skilled health staff, as well as effectively treating common diseases and illnesses.
4. **Mental Health** – the level and burden of mental illness on the living population. Mental health can have a significant impact on an individual's wellbeing and ability to participate effectively in the labour market.
5. **Physical Health** – the level and burden of physical illness on the living population. Physical health can have a significant impact on an individual's wellbeing and ability to participate effectively in the labour market.
6. **Longevity** – the mortality rate of a country's population through different stages of life, as well as maternal mortality, and common life expectancies in later life.

68.Len Doyal and Ian Gough. *A theory of human need*. Macmillan International Higher Education, 1991.

69. Paul Dolan, Tessa Peasgood, and Mathew White. "Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective wellbeing," *Journal of economic psychology* 29, no. 1 (2008): 94-122.

70. Ahmad Al-Windi. "The relations between symptoms, somatic and psychiatric conditions, life satisfaction and perceived health. A primary care based study," *Health and quality of life outcomes* 3, no. 1 (2005): 28.

71. Robert J. Barro. "Health and economic growth," *Annals of Economics and Finance* 14, no. 2 (2013): 329-366.

72. WHO Commission on Macroeconomics and Health, Working Group 1 & World Health Organization. "Health, economic growth and poverty reduction," *World Health Organization*, 2002.

Education

Education is a building block for prosperous societies; the accumulation of skills and capabilities contributes to economic growth. Education provides the opportunity for individuals to reach their potential, and experience a more fulfilled and prosperous life. A better-educated population also leads to greater civic engagement and improved social outcomes – such as better health and lower crime rates.

In general, better-educated workers have a greater choice of work and their skills are more in demand, leading to rises in individual earnings. Recent research has shown that one additional year of schooling results in a 9% increase in hourly earnings, with higher returns for women.[73]

Improved education ultimately leads to productivity gains in the economy.[74] A labour force that is highly skilled and has the capacity to continually refresh or learn new skills will produce far more than a labour force of the same size that is unskilled. In the workplace, an individual's education will indirectly benefit others, as they are more likely to be productive and may boost the productivity of colleagues through training and management.

Education has been shown to indirectly increase the subjective wellbeing of individuals, as a result of its positive effects on income, employment, health, and crime.[75] People with higher levels of education are less likely to be unemployed due to the demand of their skills in the workforce. There is evidence that a better-educated person will be healthier as they are more likely to have an enhanced knowledge of health issues. Better cognitive skills also enable them to maintain better health, and the secondary effect of higher income allows increased health expenditure, and therefore better health outcomes.[76]

While other institutional, legal, and social structures must be in place as well, education can help to empower marginalised parts of society and reduce inequalities. For instance, a basic set of skills, such as being able to make basic inferences and locate needed information, can provide access to opportunity for the disadvantaged in society. Education can support the development of democracy through greater civic participation and social cohesion, and has been shown to contribute to stronger social identity, more political engagement, greater tolerance to immigrants, and a cleaner environment.[77,78,79]

Education can be conceptualised functionally in terms of access, attainment, and quality. Instead, we have incorporated these ideas into a framework that organises education by stages. Education has been split into four stages of typical education systems, and the skills of the adult population. Enrolment, outcomes, and quality are measured for each stage of education, and the skills of the adult population are measured by educational attainment.[80]

Elements of Education

1. **Pre-Primary Education** – enrolment in pre-primary education. Pre-school supports the development of linguistic, cognitive, social and emotional skills.[81] Students who participate in pre-primary education are more likely to make it through secondary education and less likely to repeat grades.[82]
2. **Primary Education** – the availability, quality of, and enrolment in, primary education. The critical formative stage of schooling, providing pupils the opportunity to develop their cognitive, social, emotional, cultural, and physical skills, preparing them for their further school career. Most critically, this includes core literacy and numeracy skills.
3. **Secondary Education** – the availability, quality of, and enrolment in, secondary education. More years of higher quality education has been shown to increase life outcomes in both economic and social terms. Beyond attending and completing school, obtaining good test scores are a strong indicator of cognitive ability and is a strong determinant of better economic performance of a country.[83]
4. **Tertiary Education** – the availability, quality of, and enrolment in, tertiary education. Further education (including technical, vocational, and university-level) is key to social and economic development through the creation of human capital and building of knowledge bases.

73. Psacharopoulos, George, and Harry Anthony Patrinos. *Returns to investment in education: a decennial review of the global literature*. The World Bank, 2018.
74. Hanushek, Eric A., and Ludger Wößmann. *The role of education quality for economic growth*. The World Bank, 2007.
75. Dolan, Paul, Tessa Peasgood, and Mathew White. "Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective wellbeing." *Journal of economic psychology* 29, no. 1 (2008): 94-122.
76. Wigley, Simon, and Arzu Akkoyunlu-Wigley. "Human capabilities versus human capital: gauging the value of education in developing countries." *Social Indicators Research* 78, no. 2 (2006): 287-304.
77. Acemoglu, Daron, Simon Johnson, James A. Robinson, and Pierre Yared. "From education to democracy?" *American Economic Review* 95, no. 2 (2005): 44-49.
78. Milligan, Kevin, Enrico Moretti, and Philip Oreopoulos. "Does education improve citizenship? Evidence from the United States and the United Kingdom." *Journal of Public Economics* 88, no. 9-10 (2004): 1667-1695.
79. "The wellbeing effect of education," *Economic and Social Research Council*, 2014.
80. Excluding pre-primary education, where only an enrolment measure is available.
81. Bakken, Linda, Nola Brown, and Barry Downing. "Early childhood education: The long-term benefits." *Journal of research in Childhood Education* 31, no. 2 (2017): 255-269.
82. Brian Faust. "Education in Algeria: Past successes, challenges and goals," *The Borgen Project,* January 4, 2017.
83. Hanushek, Eric A., and Ludger Wößmann. *The role of education quality for economic growth*. The World Bank, 2007.

5. **Adult Skills** – the skill-base of the existing working-age population, which is a reflection of the historic quality of education as well as providing a base level for the short-term potential of the economy. Adults who are above a threshold level of education are far less likely to be disadvantaged in society and this will lead to better employment opportunities. Increased skills in the workplace are closely connected to productivity.

Natural Environment

The Natural Environment pillar captures those elements of the physical environment that have a direct impact on the ability of people to flourish in their daily lives, as well as those that affect the prosperity of future generations.

At the basic level, ecosystems provide the resources for extraction upon which many economies depend. A well-managed rural environment yields crops, materials for construction, wildlife and food, and sources of energy. A healthy climate has an impact on many areas of society; industries such as agriculture rely on healthy soil and favourable weather in order to be fruitful, while recreational activities require that natural resources (such as lakes and reservoirs) are free from pollutants and are well managed. More directly, the quality of people's everyday lived experience is dictated by exposure to environmental health hazards such as air pollution.

Exploiting natural capital in the short-term may well result in short-term economic growth. However, change of ecosystems should be managed to ensure degradation does not affect their long-term value.[84] Ecosystem degradation, by causing floods, increasing infectious diseases risk, and forcing population displacement, tends to affect the poor disproportionately. Therefore, environmental management is linked closely to poverty alleviation.[85]

Ecosystems provide aesthetic, recreational, and educational services to the human experience, contributing to essential aspects of wellbeing; they can form our sense of identity and community.[86] Access to green spaces has a direct impact on mental and physical health and an indirect impact on wellbeing by enhancing interactions between people, and therefore improving social cohesion and creating a sense of belonging.[87] Noise, temperature, pollution, and crowding increase stress and reduce the ability to cope as well as having detrimental effects on cognitive and social functioning.

The elements of the Natural Environment pillar reflect different aspects of the environment, and also preservation efforts, which captures the degree to which the natural environment is being protected for the future. Emissions and exposure to air pollution both cover air quality, but distinguish between the effects the quality of the air has on the lived experience of a population and the contribution of a nation to damaging the quality of the air.

Elements of Natural Environment

1. **Emissions** – the level of emissions of air pollutants within a country. This captures the long-term effect of pressures on the atmosphere that a given country will have on the lived experience of future generations (broadly through CO2 and methane emissions), as well as short term effects (SO2, NOx and black carbon emissions).
2. **Exposure to Air Pollution** – the level of emissions to which a country's population is physically exposed, and the effects this may have on their quality of life.
3. **Forest, Land and Soil** – the quality of a country's land, forest, and soil resources and the impact this may have on citizens' quality of life.
4. **Freshwater** – the quality of a country's freshwater resources and the impact this may have on citizens' quality of life.
5. **Oceans** – the quality of a country's marine resources and the impact this may have on citizens' quality of life. Both fish stocks and marine ecosystems, and the quality of ocean water itself are key to this element.
6. **Preservation Efforts** – the extent of efforts to preserve and sustain the environment, in terms of land, freshwater, and marine areas, for future generations, and public satisfaction with those efforts.

84. Assessment, Millennium Ecosystem. *Ecosystems and human wellbeing*. Vol. 5. Washington, D.C.: Island press, 2005.
85. Ibid.
86. Ibid.
87. Helliwell, John F., and Christopher P. Barrington-Leigh. "Measuring and understanding subjective well-being," *Canadian Journal of Economics* 43, no. 3 (2010): 729-753.

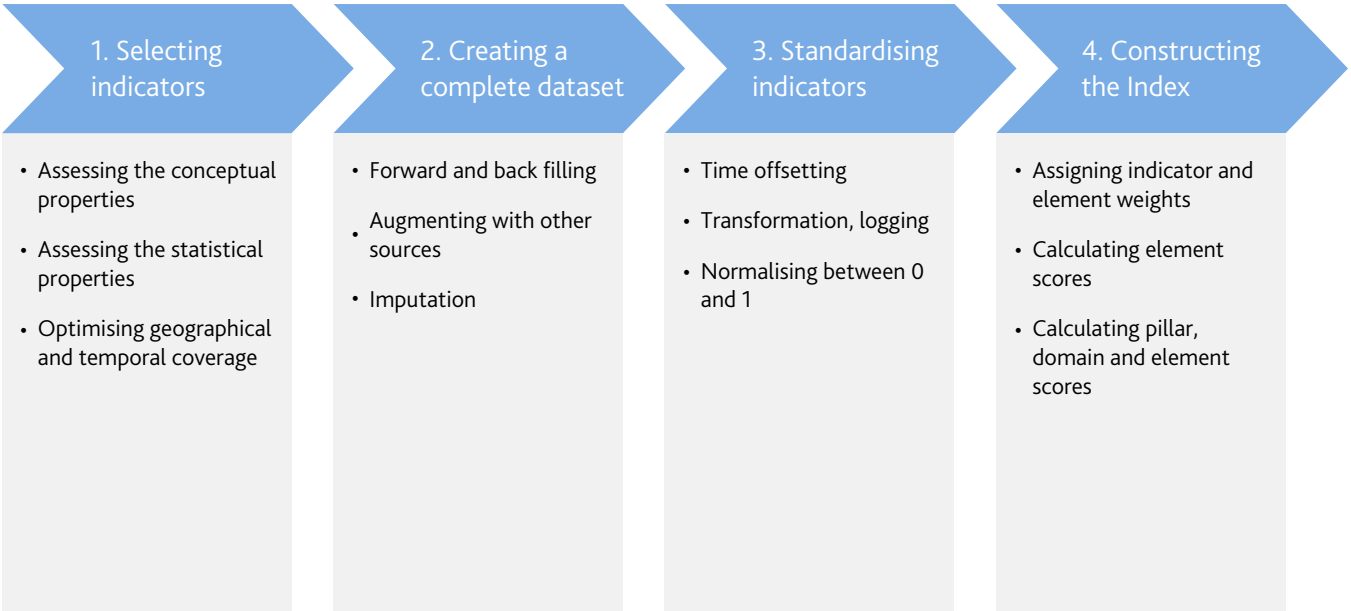
Part II
Measuring prosperity

Overview

Using a conceptual framework for measuring prosperity across the world comprising 3 domains, 12 pillars, and underpinned by 65 policy-focussed elements, we create a measurement system.

The following section describes the construction of the Prosperity Index, broadly split into four sections: (1) the selection of indicators underpinning each of the 65 elements; (2) creating a complete dataset; (3) standardising the indicators; (4) constructing the Index through a process of transformation and aggregation. This process is outlined in Figure 2, below, with more detail within each stage.

Figure 2: Overview of the calculation of the Prosperity Index



1. Selecting indicators

The goal of selecting and organising indicators underneath the framework defining prosperity has been to enable measurement of prosperity at a country level. We aim to use a set of indicators that (a) collectively act as a good proxy for the elements, and (b) have good coverage across countries and through time. Each of the 65 elements is composed of between one and eight indicators, resulting in a total of 294 indicators in the 2019 Prosperity Index.

Connection to the Element

The first set of considerations when selecting indicators for each element is how well these indicators, both in isolation and as a collective grouping, create a good interpretation of the element in question. Both conceptual and statistical reasoning were taken into consideration to identify how well a set of indicators act as a proxy for each element.

- ***Supported by academic literature:*** We choose indicators where there is wide consensus that they captured the underlying meaning of the element, and are important to improving prosperity. As well as undertaking our own literature review, our panels of over 100 global experts were indispensable in advising on which indicators were best used;
- ***Connection to productive capacity and Cantril's Ladder:***[88] We choose indicators that are plausibly a causal factor of both wealth and wellbeing. To explore this link, we look at two things: (1) the degree of correlation each indicator has with proxies for economic and social wellbeing, namely productive capacity and Cantril's Ladder (see Part III of this report), and (2) the research and academic literature around each indicator, and their connection to wealth and wellbeing. Considering both of these factors, we select indicators that are seen as plausible drivers of fundamental aspects of prosperity;
- ***Strong internal consistency:*** Whilst testing indicators against productive capacity and Cantril's Ladder informs us of the properties of these indicators in isolation, a different type of test is needed to understand the collective qualities of these indicators as part of an overall measurement. Cronbach's alpha provides a measure of internal consistency across a grouping of indicators within each element, testing whether the indicators act as a collective whole. As a general rule of thumb, we look to have Cronbach's alpha values above 0.7 for a collection of indicators within each element, and only opt to break this rule for good conceptual considerations.

Coverage both spatially and temporally

The second set of considerations in selecting indicators is the geographical and temporal coverage of each indicator:

- ***Wide coverage of countries:*** Because we are building a global Index, the data needs to cover a wide range of countries. We choose some indicators with a smaller coverage of countries if this coverage is focussed on lower and middle-income countries, and do not select indicators which have a focus on primarily higher-income countries – for example, indicators from OECD datasets;
- ***Coverage through time:*** We intended to create an Index that demonstrates how prosperity has shifted over time, rather than just the current state. To that end, we prefer indicators that capture change over time. We also prefer indicators that will be continue to be measured so that we can use updated data in future editions of the Index.

Using these criteria, we selected 294 indicators underpinning the 65 elements that provided the best articulation of these building blocks of prosperity. For a full list of indicators used in the construction of the 2019 Prosperity Index, please see Appendix II. Before the Index could be calculated from these indicators, the issue of missing data points had to first be addressed.

2. Creating a complete dataset

The Prosperity Index, as with most global composite Indexes, faces the problem of incomplete data. Some data points for some years might be missing for some countries, some indicators might be missing for some countries, and some indicators might be released with time lag. To complete our dataset, we prioritised real data in the following order:

Firstly, where missing data are detected for a country, we first use the latest known value for that indicator. For example, indicators with missing data in 2015 are assigned the corresponding values of 2014.

Secondly, where data are missing and no prior data are available, which mainly happens with the Index's earlier years, the earliest data available are employed. For example, the World Justice Project's latest data set only started in 2015. That means the earliest data, from 2015, is used to back-fill all previous years.

Thirdly, where no reliable real data for a specific country are accessible from the main source for an indicator, augmentation and imputation

88. For more about productive capacity and Cantril's Ladder, please see part III of this report.

are employed on a case-by-case basis, as explained in further detail below.

Augmenting data with other sources

One way we deal with data missing for a country for all years is by inserting values directly based on other sources for the data. For example, the Bertelsmann Stiftung Index gives scores from 0 to 10 for many countries around the world. However, because this source is focused on developing a countries, there are a number of highly developed countries missing. In this case, we give these countries the highest possible score of 10, based on our assessment that this is the score they would receive if they were included.

Additionally, in some cases data are not included in a dataset but are obtainable through different means. In these cases, we manually insert accurate data points in the most recent year available.

Imputation

If we cannot supplement missing data from an appropriate alternative source, we use linear regressions to impute an indicator value based on other independent variables. We use the following independent variables:

- Productive capacity;
- Country groupings;[89]
- Relevant 'driver variables' that have an underlying relationship with the indicator we are seeking to impute.

We select these driver variables based on whether they have a strong conceptual and/or statistical relationship with productive capacity, the element itself, and the indicators needing imputation. In addition, they must have sufficient country coverage so that they cover countries that have indicators missing.

These regressions give us several imputation options. For each indicator, we choose the formula based on the degree of correlation and statistical significance of the driver variables. We have also applied a sense-check to ensure that the implied relationship is consistent with broader research and to avoid risks of overfitting. For example, in imputing data for the indicator "efficiency of seaport services", we used the logistics performance index as a driver variable. This had the advantage of covering a large number of countries, a strong statistical relationship with the efficiency of seaport services, and a strong conceptual argument.

As a result of this process, we choose a main imputation formula. In some cases, it may not be possible for that formula to be used for all countries because it contains a driver variable that covers only some countries requiring imputation, not all. Therefore, for those countries we choose a fall-back imputation formula that uses a combination of productive capacity and country groupings.

The degree of imputation for each country with over 15% of its indicators imputed is available, broken down by pillar, in Appendix VI.

3. Standardising indicators

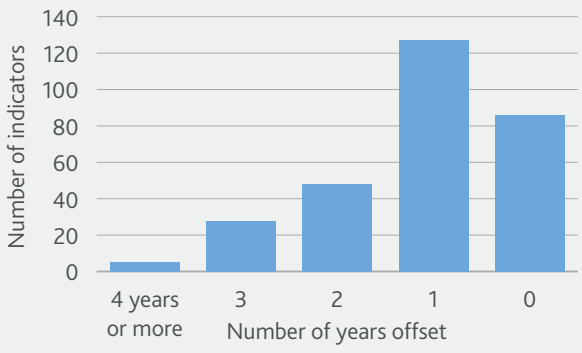
Once the set of indicators has been selected and missing data points filled, they go through a process of standardising, so that they can then be aggregated to produce composite scores at the element level, and further aggregated to pillar, domain, and Index level. This section outlines the steps undertaken to standardise indicators.

a. Time offsetting

The lags between when data is recorded, published by the source organisation, and subsequently made use of in this Index can vary by a matter of months to years, because very little data is released in the year it was collected (see Figure 3). This means we need to consider how to align the time-series of each indicator before they can be aggregated into an Index.

We offset the majority of indicators by 0-2 years, based on when they became available. So if, for example, data for an indicator for the year 2017 only became available in 2019, we would assign the data for the year 2017 to the 2019 Index, and the data for 2016 to the 2018 Index score, and so on – thereby offsetting by two years. Practically, this means that we assign data to the Index year in which it becomes available, rather than the year in which it is collected. All but five indicators used were given an offset of three years or less, as shown in Figure 3.

Figure 3: Number of indicators by years offset



89. We have created nine separate country groupings based on the underlying characteristics of that country. These groupings can be found in Appendix V.

On the other hand, assigning the data to the Index year in which it was recorded would mean that for most indicators, the data in the latest Index year would be exactly the same as the year before (due to the fact that when data is missing in a year, we roll forward a previous year's data). This would have two major disadvantages. The first is that it would create an artificial flat lining in the last year of the Index. Second, it would mean the most recent year's score would change significantly as reported in the subsequent year's Index, as the data are updated. While there will always be small changes to previous year's scores, we wanted to minimise this as much as possible.

It is worth noting that this process affects only the presentation of historical values. It does not affect the latest score. For the latest score, both approaches create a prosperity score based on the latest available data.

We considered the benefits and costs of each approach. Our view was that the offsetting approach was preferable, because it was more important to see the historical trend of prosperity, rather than the exact year in which a change occurred. Due to the fact that we note the year in which data was collected, this still means that it is possible to investigate policy changes that stimulate improvements or deteriorations in prosperity.

b. Transformation

The indicators in the Index are based on many different units of measurement, such as percentages and ordinal scales. These different units need to be normalised for comparisons between indicators and countries to be meaningful. One of the critical decisions is whether or not to take a logarithm of each indicator. In cases where the data distribution is skewed or has long tails, we log-normalise the indicator. For example, the cost in weeks of salary of redundancy for most countries is between 0 and 60 weeks. However, a select few countries have values much higher. Variation of this nature requires normalisation by taking the logarithm of the values, so that different observations can be compared within a narrower data range, and so that extreme variation in a single indicator does not unreasonably affect a countries overall performance. Forty-four indicators are transformed in this manner.

c. Normalisation

The next step is to normalise each of the 294 indicator values into values between 0 and 1. A distance-to-frontier (DTF) approach is used for this task. The distance-to-frontier approach compares a country's performance in an indicator with the values of the assumed best-case and the worst-case for the indicator. In this way, the country's relative position can be captured by the distance-to-frontier score generated.

The first step is to define the frontiers — the best and worst cases for each indicator.

Defining the frontiers

For indicators which have logical upper and lower bounds, the best and worst cases might be set at, or close to, their highest and lowest possible values. This scenario mainly applies to indicators with ordinal scales as units of measurement. The indicator "political participation and rights", for instance, is limited to values between 1 and 7, thus its frontiers can be defined according to its logical boundaries.

However, where possible, we set the boundaries such that the normalised values (between 0 and 1) contain a relatively consistent standard deviation across indicators. For indicators with clearly defined logical bounds, this often means the DTF does not rely on 'logical bounds'. That is because, in many cases, the upper or lower logical bound is never actually achieved. This is particularly the case with survey variables.

For indicators whose values can vary on a spectrum that is unlimited at one or both ends, best and worst cases are imposed on the basis of the data collected for the Index since 2009. In cases where it is likely that the historical upper bound will be superseded in the future, as with internet bandwidth, we left room for improvement, incrementally extending the upper bound.

Another key consideration in applying distance-to-frontiers is to decide whether or not there were outliers that should be excluded when selecting best and worst cases. This is done primarily because selecting frontiers to include outliers would result in very little differentiation between the majorities of the other countries.

We are typically guided by the 5% and 95% percentiles for observed values in excluding outliers. Selecting frontiers based on these percentiles means that each indicator's distance-to-frontier scores differentiate between states to a similar degree to other indicators, which is crucial when aggregating these scores to create element and pillar scores. We decided to opt for compatibility of distance-to-frontier scores for aggregation over avoiding penalisation of extremely high or low performers.

For example, the percentage of people believing their country was tolerant of ethnic minorities in each country over the last decade ranged from 11%, to 93%. However, only 5% of countries had less than 33% of the population say their country was tolerant of ethnic minorities. The boundaries set for this indicator were 30%, and 95%, based on the 5% lower bound for values.

Normalising the values

After we determine the frontiers, the next step is to calculate a country's distance-to-frontier score for each indicator. For a given indicator i, if we write $Worst\ Case$ and $Best\ Case$ for the frontiers established for this indicator, and x_i^j for country j's raw value in indicator i, then the country's normalised score is given by the following equation:

$$\frac{x_i^j - Worst\ Case}{Best\ Case - Worst\ Case}$$

Using distance-to-frontier scores allows direct comparison of values across indicators and countries, and also allows tracking and comparison of a country's performance across years. Since the upper and lower frontiers are fixed across years, changes in a country's year-to-year distance-to-frontier score reflect its improvement or deterioration in the same indicator, pillar, or overall score in absolute terms.

Where greater values indicate worse outcomes — for instance, in the case of in the case of the "number of non-tariff measures" indicator — we invert the DTFs, such that higher scores always indicate better performance.

4. Constructing the Index

At this stage, we have a set of 294 indicators, using a comparable scale, organised underneath the definitional framework of prosperity. They are now in a position to be combined, and aggregated up to measure each element, pillar, and domain of prosperity, as well as the overall measurement of prosperity, the Prosperity Index.

a. Weighting

The first step in constructing the Index is to assign weights to the indicators to determine the element score, and weights to the elements to determine the overall pillar score. As noted earlier, we recognise that not every indicator is equally important to an element, and not every element is equally important to a pillar. Therefore, each indicator is assigned a weight within an element, indicating the level of importance it has in that element. Similarly, each element has a weight that reflects its importance in the overall pillar.

We first weight indicators within an element. Indicators are typically assigned one of four weights: 0.5, 1, 1.5, and 2.[90] The default weight for each indicator is 1 and, based on its significance to the element in which it is contained, its weight is adjusted downwards or upwards. An indicator with a weight of 2 is twice as important in affecting the concept its element represents as an indicator with a weight of 1.

Weights are determined by three factors:

- The relevance and significance of the indicator with respect to its element, which is informed by the academic literature, policy debate, and expert opinion;
- The robustness and reliability of the indicator in question, whether it has any known measurement flaws;
- The significance of the indicator in its relationship with both economic and social wellbeing in a global context.

While seemingly more objective to weight each of our indicators equally, we choose variable weights for our indicators for a number of reasons. First, because we include a wide variety of different indicators, in line with our multidimensional view of prosperity. Second, because some indicators are more important than others in delivering prosperity. In the Prosperity Index, equal weighting would be tantamount to claiming that in the Terrorism element of the Safety and Security pillar, for example, the property cost of terrorism (weight x1) is as important as the number of deaths caused by terrorism (weight x2). Weights allow us to speak to a range of issues while remaining true to our conceptual framework and research findings.

After weighting the indicators, we weight elements within each pillar, led by the same three factors above. At the element level we apply weights as percentages rather than factors.

b. Calculating element scores

Once the indicators have been normalised and assigned a weight, they can be aggregated to create an element score. We use the convention of indicator scores lying between 0 and 1 after normalisation.

In each element, the scores for each indicator are summed together to give an element score.[91] As a formula, an element score E for an element with indicator scores ind_j with respective weights w_j for $j = 1, \dots, n$ is given by:

$$E = 100 * \frac{\Sigma_{j=1}^{n} w_j * ind_j}{\Sigma_{j=1}^{n} w_j}$$

This results in an element score between 0 and 100.

90. 99% of indicators received one of these four weights. Three indicators within the Market Access and Infrastructure pillar received a weight of 0.25, and one indicator within the Governance pillar, "*Civil justice*" received a weight of 3, as it had several key variables underlying it as a composite indicator.
91. Weighted sum, using the weights assigned.

Excluding irrelevant indicators or elements for specific countries

In a handful of cases, a specific indicator or element does not make sense in the context of a certain set of countries, despite being relevant to the majority of countries covered in the Index. This happens in three instances.

The first instance is voter turnout, covered in the Civic and Social Participation element of the Social Capital pillar. Whilst for the majority of countries, this indicator provides a proxy for the level of civic engagement in a country, bias is introduced by using this indicator for countries with compulsory voting (such as in Australia). The second and third are the "marine protected areas" indicator, covered in the Preservation Efforts element of the Natural Environment pillar, and the Oceans element of the Natural Environment pillar. For these, it does not make much sense to score countries if they are landlocked.

To manage these specific cases, we adjust the weights of the remaining indicators or elements for these countries proportionally to the original weighting assigned to them. An example to illustrate the method is given at the end of Part II.

c. Calculating pillar, domain and index scores

Once element scores have been constructed, they are summed to give pillar scores out of 100.[92] As a formula, the pillar score P for a pillar with element scores E_j and weights κ_j for $j = 1, \dots, m$ is given by:

$$P = \frac{\Sigma_{j=1}^{m} \kappa_j * E_j}{\Sigma_{j=1}^{m} \kappa_j}$$

Each pillar is weighted evenly. The average of the twelve pillars is taken to give an overall Index score, thus a country's Index score, $Prosp$, is given by:[93]

$$Prosp = \frac{1}{12} \Sigma_{j=1}^{12} P_j$$

Where the pillar scores for that country are P_j, for $j = 1, \dots, 12$ Similarly, domain scores are the arithmetic mean of the four pillar scores within that domain.

Conclusions

As set out in this section, there is a significant amount of detail underneath the four stages, of indicator selection, creating a complete data set, standardising indicators, and the calculation of the Index that underpins measurement of prosperity. In being able to set out these details, we hope to formalise the logic that underpins the way the Prosperity Index measures prosperity. This section, we hope, not only gives transparency about the measurement we use for prosperity, but provides a blueprint for the technical underpinning of any multidimensional index. Building such an Index requires a multitude of discrete technical decisions. Should aggregation happen using weights? Do a collective group of variables make sense as a cohesive whole? How should cases of missing data be handled? The discretisation of each decision, whilst still seeing the picture of the whole process, enables careful decision making in the technical task of building an Index.

92. Ibid.
93. Arithmetic mean.

Excluding irrelevant indicators or elements for specific countries – the Oceans element:

As noted, there were cases where an indicator or element did not make sense in the context of a few specific countries, despite having relevance for the majority of countries. One such example, is the Oceans element of the Natural Environment Pillar, for landlocked countries.

The original weighting schema for the elements within the pillar is summarised in Table 1 below.

Table 1: Natural Environment, element weights for non-landlocked countries

Element	**Weight (for non-landlocked countries)**
Emissions	15%
Exposure to Air Pollution	15%
Forest, Land & Soil	20%
Freshwater	20%
Oceans	*15%*
Preservation Efforts	15%

For landlocked countries, we split the additional 15% weight assigned to the Oceans element in proportion to the weight we originally assigned to that element, so the 15% originally assigned to the Oceans element is split between the remaining elements for landlocked countries as shown in Table 2 below.

Table 2: Natural Environment, element weights for landlocked countries

Element	**Original Weight (for non-landlocked countries)**	**Adjustment factor (15% * Original Weight)**	**Weight (for landlocked countries)**
Emissions	15%	+2.25%	17.25%
Exposure to Air Pollution	15%	+2.25%	17.25%
Forest, Land & Soil	20%	+3%	23%
Freshwater	20%	+3%	23%
Oceans	*15%*		
Preservation Efforts	15%	+2.25%	17.25%

The methodology for excluding irrelevant indicators for specific countries allows us to remain true to our weightings, representing the relevant importance of each element/indicator, without having to impute values into a context where they do not make sense.

Part III

Assessing the Prosperity Index and its pillars

Introduction

In constructing the Prosperity Index, we want to test the structural integrity of the Index as it is constructed. Several statistical analyses for each pillar and for the overall Index were carried out. This section outlines some of the analysis undertaken during and following construction of the Prosperity Index. Further summary statistics can be found in Appendix IV.

Productive capacity and Cantril's Ladder

The role of productive capacity and Cantril's Ladder

In constructing the Index, we wanted to benchmark against measures that capture the policy-relevant drivers of both social and economic wellbeing. For the former, we used a measure known as Cantril's Ladder, which is self-reported and measured on an ordinal scale of 0 (lowest) to 10 (highest).[94] For the latter, we constructed a measure called 'productive capacity', which is the total GDP of a country excluding resource rents, divided by the working age population. This removes two distorting effects on a country's GDP that misrepresent the underlying productive capacity: demographics and resource rents.

GDP per capita, as a welfare measure, acts as a useful proxy for the average income of the population of a nation. For most nations, without atypical demographic trends or significant resource rents, it works as

94. The life satisfaction question is: "Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose we say that the top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time, assuming that the higher the step the better you feel about your life, and the lower the step the worse you feel about it? Which step comes closest to the way you feel?" The data are from Gallup's World Poll and refer to 2018 data. Figure 4(b) is based on the 140 countries for which there is data from the survey.

a clean proxy for productive capacity. However, for others, it does not necessarily capture a nation's true economic wellbeing and the quality of its economic structures and policies.

In accounting for resource rents and demographic patterns, we hope to produce a more accurate picture of what the productive population of a nation contributes to the economy, rather than what they earn. Fundamentally, this is a question of rents vs. productivity. We wish to measure productivity instead of rents, as measuring the latter tends to produce perverse policy objectives, often with poor alignment between short and long-term goals.

For more information about the construction and role of productive capacity in developing and assessing the Prosperity Index, please see the *"Measuring economic wellbeing"* essay in the *2019 Prosperity Index* report.

Comparison with productive capacity and Cantril's Ladder

Comparing the index to established, or simple, measures of both wealth and wellbeing allow us to see whether the rankings produced by the Prosperity Index broadly align with other accepted views of benchmarking indicators of prosperity.

Figures 4 (a) and (b) shows the relationship between overall prosperity and the chosen proxies for both wealth and wellbeing. As they show, the overall Prosperity Index shows a reasonably strong positive correlation with both of these measures.

The results above show that 83% of the variation in productive capacity between countries can be explained by the Prosperity Index, and analogously, 68% of the variation in Cantril's Ladder between countries. It is worth noting that the relationship between productive capacity and overall prosperity is marginally stronger than that between GDP per capita and prosperity. More importantly, this relationship is also stronger at a deeper level – regressing each pillar against productive capacity and GDP per capita reveals a closer relationship for each of the 12 pillars with productive capacity.

Figure 4(a): Productive capacity v Prosperity Index

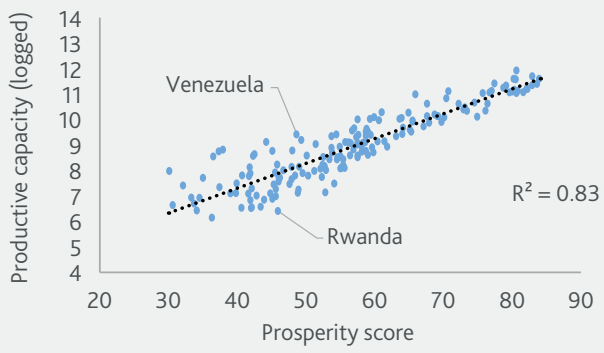
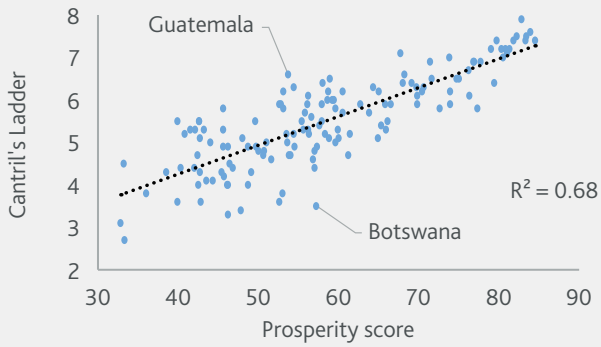


Figure 4(b): Cantril's Ladder v Prosperity Index



Figures 4 (a) and (b) also call out some of the outliers when comparing prosperity to productive capacity and Cantril's Ladder. Venezuela, for example, has a higher level of productive capacity than its prosperity score would indicate, where a decade prior, these two measures may have aligned more closely for Venezuela, the effects of a deep financial crisis has affected Venezuela across all twelve pillars of prosperity. Analogously, Rwanda has lower productive capacity than its level of prosperity would indicate. Whilst Rwanda has a strong performance across the Open Economies domain of the Prosperity Index, the country ranks 145th for Living Conditions, and 121st for Safety and Security. Similarly, Guatemala has a higher score for the Cantril's Ladder scale than its prosperity would indicate, and Botswana lower than its prosperity would indicate.

The pillars and associated elements have varying degrees of correlation with productive capacity and Cantril's Ladder (see Tables 5 and 6(a-c) in the Appendix). Most of the twelve pillars show statistically significant correlations, with Market Access and Infrastructure the highest. This shows that each of the pillars is associated with both wealth and wellbeing. Only the Natural Environment pillar exhibits a Pearson correlation of under 0.6. Whilst there is a slightly weaker statistical relationship for this pillar, our work with expert advisors around the world, and the relevance shown in academic and policy-focussed literature (outlined in Part I of this report), indicate the importance of the natural environment to prosperity.

Internal tests

In constructing the Index, we wanted to ensure that it made sense to combine the selection of indicators within elements and elements within pillars as chosen. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. We aim to get a Cronbach's alpha above 0.7 as a rule of thumb.

The Cronbach's alpha for each pillar can be found in Table 6 in the Appendix. As can be seen, there are high values for nearly all pillars, with only Social Capital and Natural Environment below 0.7. Similarly, at the element level, Cronbach's Alpha was above 0.7 for over two thirds of elements, but some elements they were lower. For those pillars and elements that have alphas below 0.7, we discussed their conceptual standing with external experts and found that reasons for their inclusion counterbalanced the statistical findings. On the whole, the Cronbach's alpha values therefore confirm that the elements and indicators are internally consistent and add up to a cohesive whole.

Sensitivity to changes in weighting

Our weighting choice is only one of many possible approaches that would be equally justifiable on different grounds. In discussions with experts, the issue of sensitivity of composite Indexes to different weighting choices was a topic that often came up.

In this section, we test the impact on the Index's scores and rankings by changing our weighting approach in two ways: (1) by comparing against an Index using equally weighted indicators and elements, and (2) assessing against randomised weightings, derived using Monte Carlo randomisation simulations.

Equal weighting approach

The first test of the sensitivity of the Index to changes in the choice of weightings is to understand how the rankings of the Index would change if we were to use equal weighting.

Figure 5 plots, on the vertical axis, countries' rankings derived by equally weighting indicators and elements and, on the horizontal axis, countries' rankings derived using our weighting approach. The overall correlation is clearly strong. Equally weighting indicators and elements sees many countries experience minor changes in their overall prosperity score and ranking.

Figure 5: Ranking with Prosperity Index weighting vs equal weighting

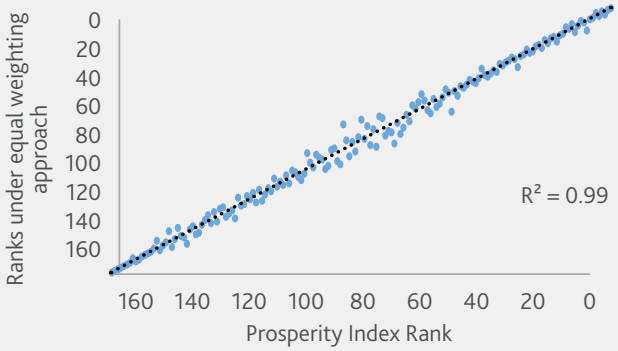


Table 3, as shown at the bottom of this page, outlines the five countries where the ranking changed by 10 or more places by using equal weighting for elements and indicators.

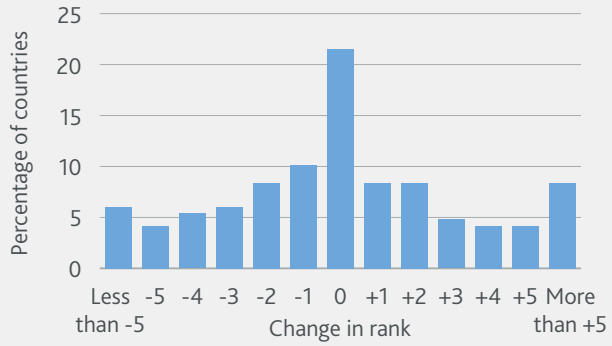
The differences in ranking under an equal weighting approach for each of these countries is, unsurprisingly, due primarily to indicators and elements that were consciously down weighted due to lack of data. For example, Guyana, the Philippines, and Ghana all rank in the top 60 for pre-primary education, which contains just one indicator due to a lack of globally reported data for pre-primary completion rates and quality. Using weighting in the Prosperity Index allows us to account for the lack of data to measure pre-primary education, despite it perhaps having as much importance as other levels of education – an equal weighting approach means that countries can be affected more heavily by extreme values in pre-primary enrolment.

Table 3: Countries changing 10 or more places under equal weighting approach

Country	Prosperity Index Rank	Equal Weighting Approach	Difference
Guyana	90	74	-16
Philippines	84	71	-13
Ghana	102	92	-10
North Macedonia	54	66	+12
Belarus	73	86	+13

The breakdown of the rank change in the remaining countries is outlined in Figure 6 below.

Figure 6: Impact on rankings when using equal weighting approach



Overall, the weights chosen for the elements and indicators do not create a large deviation in ranks when compared to equal weightings.

Randomised weighting approach

A second test to understand the sensitivity of the Index to the choice of weightings, is to understand how the rankings of the Index vary when weighting choices are randomised. To do so, we used Monte Carlo simulations – generating Index ranks 1,000 times with indicators randomly allocated a weighting from [0.5, 1.0, 1.5, 2.0] each time.

Figure 7 shows the outcome of this simulation for each country. The countries have been ordered by their ranks under the current weighting approach (illustrated with a blue cross). The range between the 5th and 95th percentile ranks for each country is shown by the vertical bar for each country. This illustrates the volatility of the rank based on the indicator weightings. The median rank is also marked on the line.

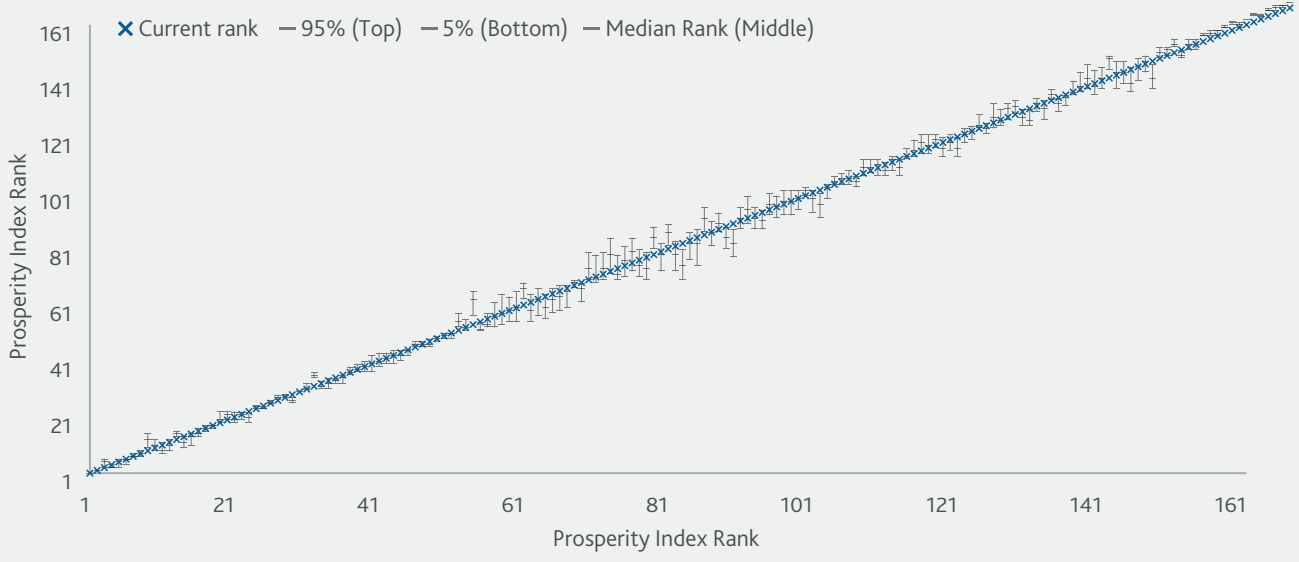
The range of ranks is uniformly quite small across all 167 countries covered in the Index, with only eleven countries ranks having a range over 10 places, and the maximum range being just 12, in Belarus and Vietnam. Furthermore, the median rank is a better comparator after 1,000 simulations, and only six countries median ranks differ by more than 5 places from their rank in the Prosperity Index – North Macedonia (-8 vs. median rank), Belarus (-7 vs. median rank), Bosnia and Herzegovina (-7 vs. median rank), Paraguay (-6 vs. median rank), Iraq (-6 vs. median rank) and Nigeria (+7 vs. median rank).

Belarus and North Macedonia both experience some of the largest ranking changes under equal weighting and randomised weighting when compared to the Prosperity Index. For North Macedonia, this is primarily due to the Labour Market Flexibility (127th) and Pre-Primary Education (116th) elements, which we consciously down weighted due to data availability. The changes in Belarus' rank have been driven by a greater combination of elements, principally Macroeconomic Stability, Communications, and Productivity and Competitiveness.

The choice and application of weights constitute our view of the relative importance of indicators in their contribution to prosperity, after considering the statistical analysis and seeking the advice of our panel of global experts.

The sensitivity analysis demonstrates that the rankings are relatively stable when they are placed under different weighting scenarios. This implies that the scores and rankings in the Index are affected more by variables in the indicator values than the weights that have been applied.

Figure 7: Range of ranks under randomised weighting approach



Limitations of the Index:

Every global Index has limitations and cannot explain the world fully. Some primary limitations of the Prosperity Index are the following:

Over-reliance on survey data: We depend on expert survey data for many of our indicators. The primary problem this presents is the collinearity between indicators that conceptually have no link. This is often because respondents will give similarly biased responses across a range of answers.

The efficacy of the data: There are always challenges obtaining data that captures the core idea of what we are trying to communicate. That is why, in some cases, we need to use outcome data rather than input data.

Data availability: It is sometimes the case that data becomes unavailable, as it has been discontinued. This means we occasionally need to change the source of the data. This also makes it hard to create a time-series, if an organisation discontinues one indicator and creates a new one.

Comparison with other global Indexes

As part of the stress-testing of the Prosperity Index, we compared the Index with three other indexes that examine areas of social or economic wellbeing across the world:

- The Human Development Index (United Nations Development Programme);
- The Social Progress Index (Social Progress Imperative);
- The Global Competitiveness Index (World Economic Forum).

Ever since its first release in 1990, the United Nations' Human Development Index (HDI) has been the global standard in measuring human development beyond GDP alone. Its three components — health, education, and income — are equally weighted. It ranges from 0 (lowest human development relative to the rest of the world) to 1 (highest possible relative human development).

Produced since 2013, the Social Progress Index (SPI) measures the well-being of a society through three dimensions – Basic human needs, foundations of well-being, and opportunity, which are equally weighted to produce an overall assessment of the social progress of a nation. Whilst the SPI excludes economic variables, it is an authoritative measure of social wellbeing at a national level. Scores range from 0 (lowest social progress) to 100 (highest possible social progress).

The Global Competitive Index (GCI) is the index underlying the World Economic Forum's *Global Competitiveness Report*, produced since 2004, providing insight into the drivers of productivity and competitiveness in nations around the world. Its underlying indicators are organised into twelve pillars of equal weighting in their importance to competitiveness and economic productivity.

We wanted to understand how the Prosperity index compared to these Indexes. Whilst the conceptual underpinning and aims of each Index are not the same, each of these three indexes have proven themselves to be reputable measures of aspects central to prosperity as defined by our conceptual framework.

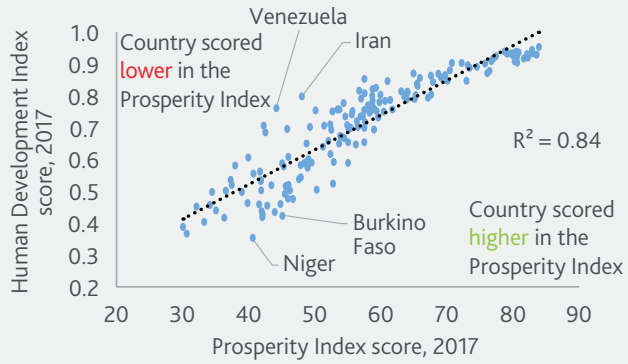
To understand these differences, given the different measurement criteria, we ran simple regressions against these indexes to tell us the similarities and differences between the Prosperity Index and other Indexes. Looking at how similar the scores are, and the outliers in each Index gives us an understanding of the general overlap with these Indexes, and what might be learnt from where the measurements highlight differences in specific nations.

The first thing to notice is the high degree of correlation with each of the other Indexes, which can be seen in Figures 8 (a), (b) and (c) overleaf. The Human Development Index aligns most closely with the framework underpinning the Prosperity Index, yet reveals the most dissimilarity with an R^2 of 0.84, compared to an R^2 of 0.90 with the Global Competitiveness Index, and an R^2 of 0.93 with the Social Progress Index.

There are key differences between the Prosperity Index and the HDI. Firstly, the HDI considers only four underlying indicators; life expectancy at birth, mean years of schooling, expected years of schooling and GNI per capita. There is of course power in the simplicity of this construction, and all four indicators have academic grounding. Nevertheless, the nature of an Index comprised of almost 300 indicators is significantly different than that of an Index consisting of just four – both types of measurement are valuable in assessing prosperity, but their priorities are set slightly differently. Highly multidimensional

Indexes, such as the Prosperity Index (and the Social Progress Index, and Global Competitiveness Index) seek not only to measure, but to explain, but they are significantly more complex than transparent metrics with only a few underlying variables. Secondly, the HDI's conceptual framework gives no consideration to the role of Inclusive Societies.

Figure 8(a): Prosperity Index v Human Development Index



The similarity between the scores produced by the Prosperity Index and the remaining two Indexes, the Social Progress Index and the Global Competitiveness Index, is significant, with both above 0.90. Whilst all three Indexes hold different measurement criteria, there is a high degree of agreement about the relative rankings of nations.

Figure 8(b): Prosperity Index v Social Progress Index

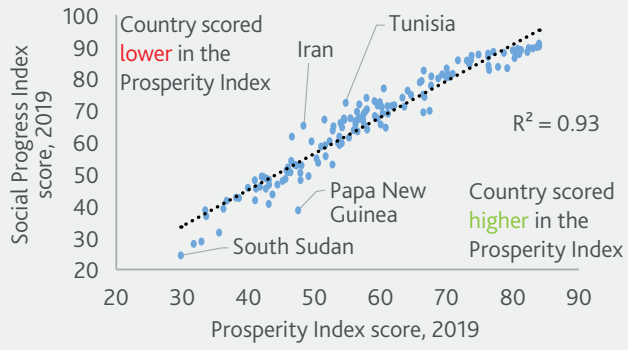
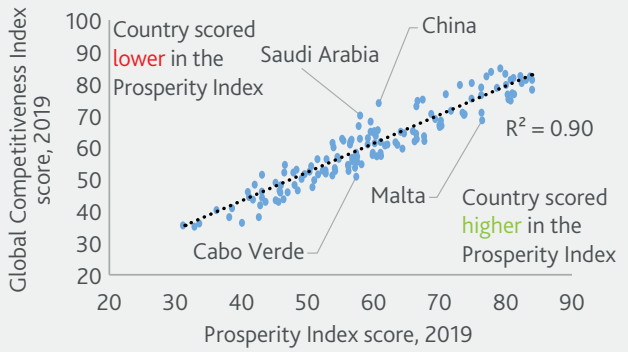


Figure 8(c): Prosperity Index v Global Competitiveness Index



Another thing that is noticeable from the figures is that Iran underperforms on the Prosperity Index relative to both the Human Development Index and the Social Progress Index. Primarily, this is driven by Iran's low score in the Personal Freedom pillar of the Prosperity Index (ranking 163rd). The Human Development Index does not consider an analogous area in their Index, and whilst the Social Progress Index do touch on areas relating to Personal Freedom, they are primarily within two components of their measurement (Personal Rights, and Inclusiveness), which are analogous to elements within the Prosperity Index's framework. Figures 8 (a), (b) and (c) call out a few of the other significant outliers when comparing these Indexes, which primarily are the result of the different frameworks underpinning each Index.

Part IV

Comparison to the previous Index

Introduction

Our ambition for the Index is that it is the most effective data tool for political leaders, policymakers, business leaders, investors, philanthropists, media, and civil society, helping to create the pathways from poverty to prosperity. To help achieve this ambition, we keep the Index under regular review and make improvements when necessary.

Through our engagement with a range of users, it has become increasingly clear that some work was necessary to re-structure the Index to be more policy-focussed and to strengthen the Index so it more fully reflects the economic aspects of prosperity. Over the past year, therefore, with the help and guidance of external experts, we have reviewed and updated the Index. The result is an improved, policy-focussed Index that is a more powerful transformative tool, to help deliver change. In this section of the methodology report, more detail on the changes that have been made to the Index is provided, along with the resulting impact.

The changes we have made have strengthened the underpinning structure of the Index, but the overall measure of prosperity remains very similar. This is evidenced by the high degree of correlation between the new and previous country prosperity scores ($R^2 = 0.96$, see Figure 11) and the strong similarity in the trend lines of global prosperity scores in the new and previous Index (Figure 12).

What changes have been made to the Index?

In addition to making the Index more policy-focussed, and strengthening the economic aspects, we also took the opportunity to improve our understanding, articulation, and measurement of each pillar of prosperity. In particular, we wanted to learn from the work of others. As well as drawing from the expertise of over 100 advisors, we studied nearly 50 other Indexes, comparing them to the pillars of the Prosperity Index, including the Global Competitiveness Index, Social Progress Index, Rule of Law Index, and Better Life Index.

The purpose of reviewing against these other Indexes was:

- To use the other Indexes as a comparator for each pillar of the Prosperity Index, and to understand the underlying reasons behind any differences that arise;
- To ensure our understanding of each pillar of prosperity was holistic and that our proposed taxonomy of elements aligned with the thinking of other Indexes.

As one example, for the Governance pillar, 2018 scores from the previous Index were compared to the Rule of Law Index 2018, as shown in Figure 9(a).

Figure 9(a): Rule of Law Index 2018 vs PI Governance score (Previous Index)

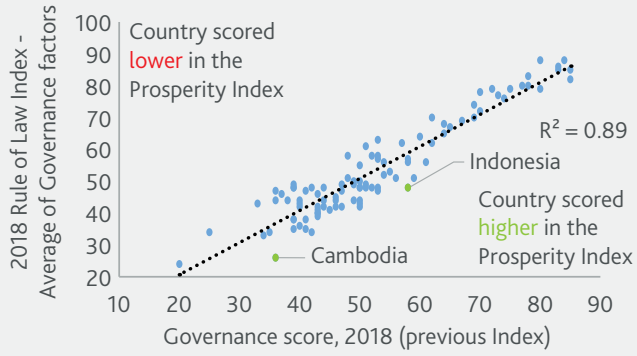
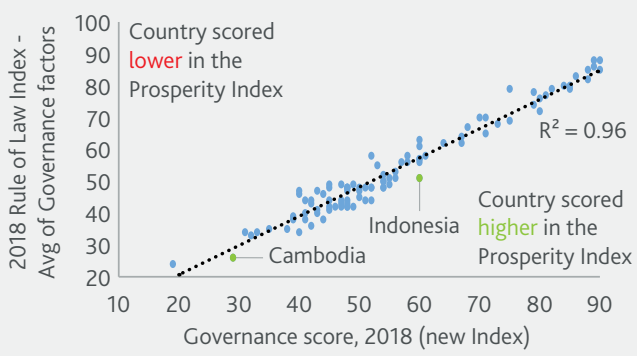


Figure 9(b): Rule of Law Index 2018 vs PI Governance score (New Index)



We see that Cambodia and Indonesia had high scores in last year's Governance pillar when compared against the 2018 Rule of Law Index (RLI). When investigating these differences, it became clear that both of these countries scored relatively poorly in the RLI's Civil and Criminal Justice components, which wasn't covered in the previous Prosperity Index. Seeing and understanding this difference was one reason that led us to include a measure of judicial integrity in the Government Integrity element in the new Index, as this was an area in which we could strengthen the pillar. The effect of this has been a relative reduction in Cambodia and Indonesia's Governance scores in the new Index, and these results now align more closely with the Rule of Law Index (see Figure 9(b)).

We undertook a similar process with each of the pillars, looking at the differences in results produced in comparison to other Indexes, which informed us as we revised each pillar.

As a result of the engagement with the expert advisors and comparing with other Indexes, the Prosperity Index has moved from 9 to 12 pillars of prosperity, and incorporated 65 policy-focussed elements containing 294 indicators.

This has expanded from 104 indicators last year, of which 88 have been directly used in this year's Index. Some of the indicators used last year have been further disaggregated to give a better understanding for policy purposes. For example, the overall mortality rate featured in last year's Health pillar didn't differentiate across age brackets, whereas for this year, we disaggregated this into the rates for the different stages of life (i.e. under 5, 5-14 and 15-60). This level of granularity will help us to see precisely the drivers of longevity across different countries and enable a more targeted policy response.

Table 4, in the Appendix, provides a breakdown of new and existing indicators used within the 2019 Index.

Impact of changes at the pillar level

In order to understand the impact of the changes made at the pillar level, we compared country scores in the new Index against the scores of the previous Index and identified and examined the outliers. The following Figures 10(a-h) show the results for each of the eight pillars, displaying scatter plots of 2018 country scores in the new and previous Indexes.

With an R^2 above 0.8, all but one pillar shows a reasonably strong relationship between the new and previous Index. The relationship between the scores of the Natural Environment pillar (represented by $R^2 = 0.66$) indicate that this pillar has been affected the most by the methodological update. This reflects the new concepts that have been

Figure 10(a): Safety & Security, 2018

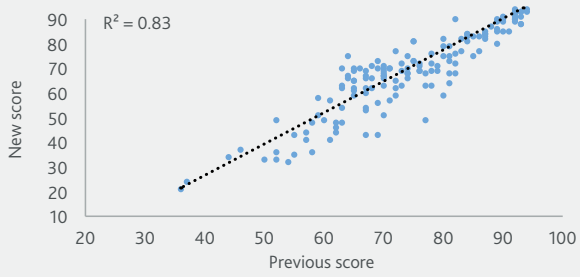


Figure 10(b): Personal Freedom, 2018

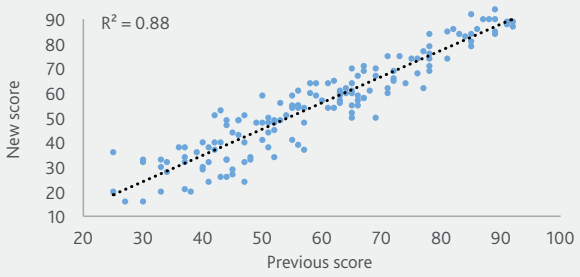


Figure 10(c): Governance, 2018

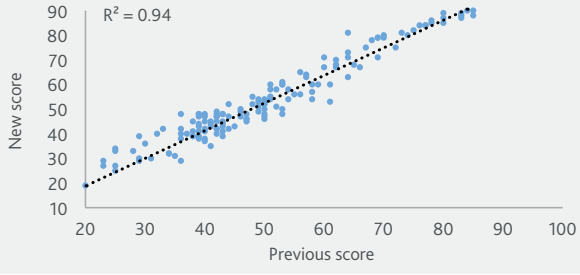


Figure 10(d): Social Capital, 2018

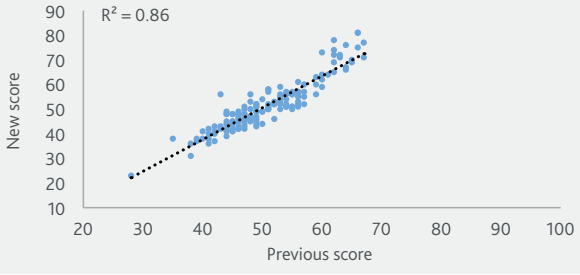


Figure 10(e): Economic Quality, 2018

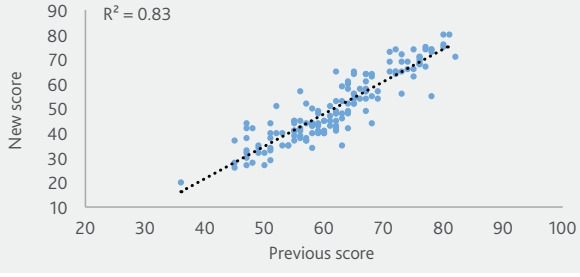


Figure 10(f): Health, 2018

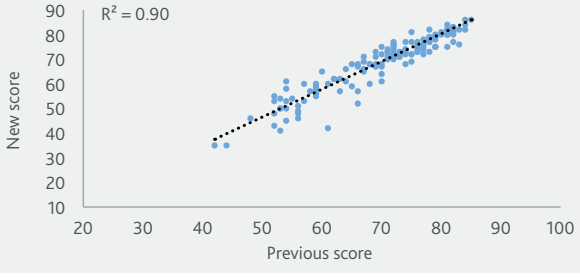


Figure 10(g): Education, 2018

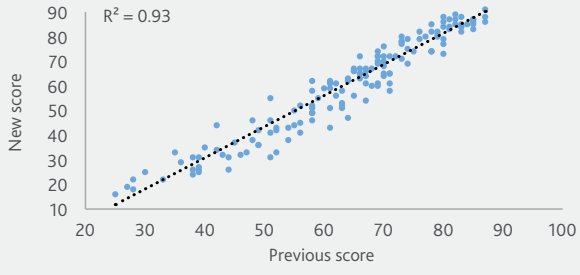
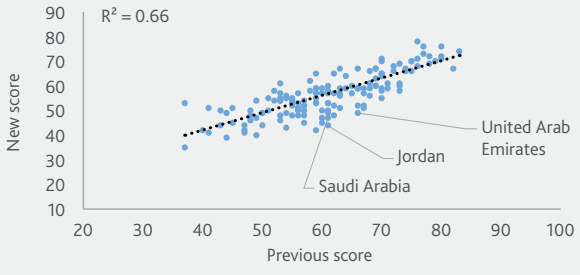


Figure 10(h): Natural Environment, 2018



included in the Natural Environment pillar this year (e.g. Forest, Land and Soil), as well as setting the scope of indicators in the Emissions element to more comprehensively reflect the nature of all air pollutants. This gives a more thorough representation of the natural environment than last year.

These changes mean that countries in the Middle East with extractive industries (e.g. Saudi Arabia, Iran, Iraq, and United Arab Emirates) have been most impacted due to their elevated carbon dioxide and nitrous oxide emissions, and low forest coverage. Both factors have a negative impact on their Natural Environment score and consequently, they have scored lower in this year's Index compared to the previous Index.

Economic Quality and Safety and Security have also been impacted by the changes made to these pillars, although to a much lesser extent than Natural Environment. In addition to containing new indicators (which will account for some of the difference), indicators from the previous Index have been moved from both pillars to the newly created Living Conditions pillar.

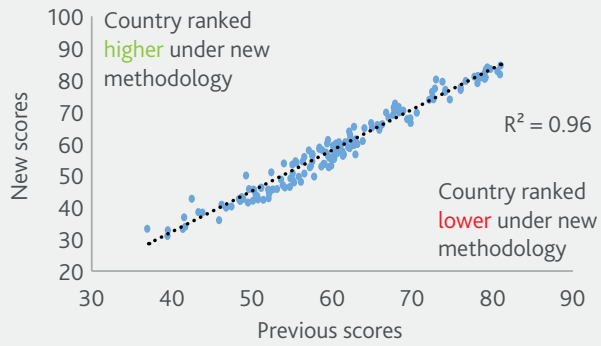
Impact of changes on overall prosperity

We have compared the results of the new Index against those of the previous Index. Although the new Index contains four new pillars, eight revised pillars, and three times as many indicators, we find that the overall results are very similar to the previous Index, as shown by the following two analyses.

Firstly, we carried out the same analysis for overall prosperity scores as for each of the eight pillars, with Figure 11 showing the overall prosperity scores for each country for the 2019 Index compared to the previous Index, for the year 2018.

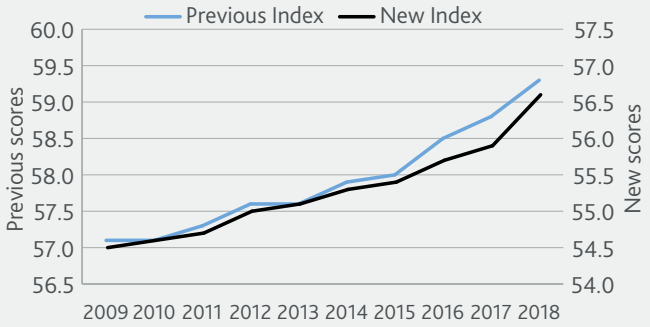
The chart shows that there have been some changes to the rankings of countries due to the changes made to the Index, but the changes are small, and the strength of relationship between the new and previous Indexes is very strong. At the end of this part, New Zealand is examined as a case of one specific country affected by the changes.

Figure 11: 2018 Overall prosperity



Secondly, we see from Figure 12 that global prosperity over time has followed a similar trend using both the previous and new Index.

Figure 12: Comparison of global prosperity under new and previous methodology

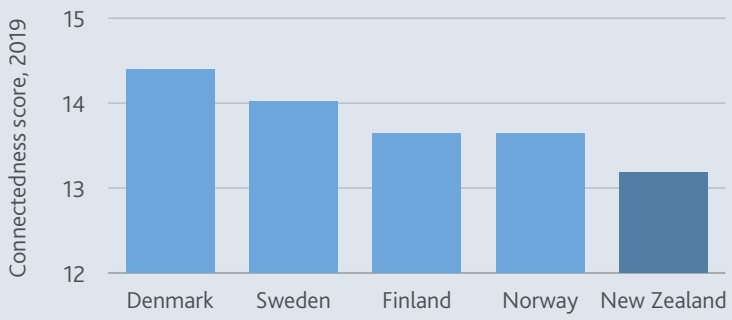


In practical terms, although this year's Index has enabled prosperity to be described in much finer and more relevant detail than before, the changes made to the Index hasn't significantly altered historical levels of global prosperity, showing that the new Index has provided a consistent measure of overall prosperity. In other words in reviewing and refining the Prosperity Index, we have not re-defined prosperity, but retained a consistent view with the measurement we have undertaken over the past 13 years, yet produced an Index with greater explanatory power and structure.

Impact of changes on New Zealand

An example of a country whose overall prosperity rank has shifted slightly is New Zealand (8th), which in the previous Index had regularly ranked in the top 3 countries. In the new Index, New Zealand has been overtaken by all Scandinavian countries, due in part to their better living conditions. Some aspects of living conditions where New Zealand performs poorly compared to Scandinavian countries include low satisfaction in public transport, and roads and highways. Rural access to roads is also measured as relatively poor. All of these are components of Connectedness, an element of prosperity, which is new for this year's Index. New Zealand's connectedness compared to Scandinavian countries is shown in Figure 13.

Figure 13: Scandinavian Countries & New Zealand - Connectedness



Appendix

Appendix I: List of sources

We obtain our data from the following sources:

Source Code	Source Name	Web address
AD	Aswath Damodaran	http://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html
AltAng&Pat	Altinok, N., N. Angrist and H.A. Patrinos. 2018. "Global data set on education quality (1965-2015)."	http://documents.worldbank.org/curated/en/706141516721172989/Global-data-set-on-education-quality-1965-2015
BL	Barro and Lee dataset	http://www.barrolee.com/
BTI	Bertelsmann Stiftung Transformation Index	https://www.bti-project.org/en/home/
Cas&Dom	Castello-Climent and Domenech (2012)	https://ideas.repec.org/p/iei/wpaper/1201.html
CDIAC	Carbon Dioxide Information Analysis Center	https://cdiac.ess-dive.lbl.gov/
Chinn-Ito	Chinn-Ito Index	http://web.pdx.edu/~ito/Chinn-Ito_website.htm
CIRIGHTS	CIRIGHTS Dataset	https://www.binghamton.edu/institutes/hri/researcher-resources.html
CSP	Center for Systemic Peace	https://www.systemicpeace.org/
ECI	Economic Complexity Index	https://oec.world/en/rankings/country/eci/
EDGAR	Emissions Database for Global Atmospheric Research	https://www.eea.europa.eu/themes/air/links/data-sources/emission-database-for-global-atmospheric
EPI	Yale and Columbia Universities (Environmental Performance Index)	https://epi.envirocenter.yale.edu/
FAO	Food and Agriculture Organisation	http://www.fao.org/home/en/
FH	Freedom House	https://freedomhouse.org/
FI	Fraser Institute	https://www.fraserinstitute.org/

Source Code	Source Name	Web address
Gallup	Gallup	https://www.gallup.com/home.aspx
GBD	Global Burden of Disease study	http://www.healthdata.org/gbd
GDL	Global Data Lab	https://globaldatalab.org/
GSI	Global Slavery Index	https://www.globalslaveryindex.org/
GSMA	Groupe Spéciale Mobile Association	https://www.gsma.com/
GTD	Global Terrorism Database	https://www.start.umd.edu/gtd/
IBNET	International Benchmarking Network for Water and Sanitation Utilities	https://www.ib-net.org/
IBP	International Budget Partnership	https://www.internationalbudget.org/
IDEA	International Institute for Democracy and Electoral Assistance	https://www.idea.int/
IDMC	Internal Displacement Monitoring Center	http://www.internal-displacement.org/
IHME	Institute for Health Metrics and Evaluation	http://www.healthdata.org/
ILGA	International Lesbian, Gay, Bisexual, Trans and Intersex Association	https://ilga.org/
ILO	International Labour Organisation	https://www.ilo.org/global/lang--en/index.htm
IMF	International Monetary Fund	https://www.imf.org/external/index.htm
IMF-FAS	International Monetary Fund Financial Access Survey	https://data.imf.org
IMF-WEO	International Monetary Fund World Economic Outlook	https://www.imf.org/external/pubs/ft/weo/2019/01/weodata/index.aspx
ITU	International Telecommunications Union	https://www.itu.int/en/Pages/default.aspx
IVS&Bar	Integrated Values Survey, Afrobarometer, Arab Barometer, and Latinobarómetro	http://www.worldvaluessurvey.org/wvs.jsp; https://europeanvaluesstudy.eu/; http://www.afrobarometer.org/; https://www.arabbarometer.org/; http://www.latinobarometro.org/lat.jsp
JMP	WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation	https://www.unwater.org/publication_categories/whounicef-joint-monitoring-programme-for-water-supply-sanitation-hygiene-jmp/
OHI	Ocean Health Index	http://www.oceanhealthindex.org/
OPHI	Oxford Poverty and Human Development Initiative	https://ophi.org.uk/
Pew	Pew Research Center	https://www.pewresearch.org/
PTS	Amnesty International & US State Department Political Terror Scale	http://www.politicalterrorscale.org/
QS	QS World University Rankings	https://www.topuniversities.com/qs-world-university-rankings
RAI	Rural Access Index	https://datacatalog.worldbank.org/dataset/rural-access-index-rai
RsF	Reporters Without Borders	https://rsf.org/en
TE	Trading Economics	https://tradingeconomics.com/
TES	TES University Rankings	https://www.timeshighereducation.com/content/world-university-rankings
UCDP	Uppsala Conflict Data Program	https://ucdp.uu.se/
UIC	International Union of Railways	https://uic.org/

Source Code	Source Name	Web address
UNAIDS	Joint United Nations Programme on HIV and AIDS	https://www.unaids.org/en
UNCOM	United Nations Comtrade Database	https://comtrade.un.org/
UNCTAD	United Nations Trade Data	https://unstats.un.org/unsd/trade/default.asp
UNESCO	UNESCO Institute for Statistics	http://uis.unesco.org/
UNESD	United Nations Energy Statistics Database	https://unstats.un.org/unsd/energy/edbase.htm
UNHCR	United Nations High Commissioner for Refugees	https://www.unhcr.org/en-us/
UNICEF	United Nations International Children's Emergency Fund	https://www.unicef.org/
UNIGME	United Nations Inter-agency Group for Child Mortality Estimation	https://childmortality.org/
UNWCMC	UN Environment World Conservation Monitoring Centre	https://www.unep-wcmc.org/
V-DEM	Varieties of Democracy	https://www.v-dem.net/en/
WB-DB	World Bank Doing Business Index	https://www.doingbusiness.org/en/doingbusiness
WB-DI	World Bank World Development Indicators	https://datacatalog.worldbank.org/dataset/world-development-indicators
WB-ES	World Bank Enterprise Surveys	https://www.enterprisesurveys.org/
WB-GFI	World Bank Global Financial Inclusion	https://globalfindex.worldbank.org/
WB-LPI	World Bank Logistics Performance Index	https://lpi.worldbank.org/
WDPA	World Database on Protected Areas	https://www.protectedplanet.net/
WEF	World Economic Forum Global Competitiveness Index	http://reports.weforum.org/global-competitiveness-report-2018/
WGI	Worldwide Governance Indicators	https://info.worldbank.org/governance/wgi/
WHO	World Health Organisation	https://www.who.int/
WHO-GDO	World Health Organisation (Global Dementia Observatory)	https://www.who.int/mental_health/neurology/dementia/Global_Observatory/en/
WIPO	World Intellectual Property Organisation	https://www.wipo.int/portal/en/index.html
WJP	World Justice Project (Rule of Law Index)	https://worldjusticeproject.org/our-work/wjp-rule-law-index
WomStat	The WomanStats Project	http://www.womanstats.org/
WRI	World Resources Institute	https://www.wri.org/
WTO	World Trade Organisation	https://www.wto.org/
Zhang & Davidson	Zhang, Xin, and Eric Davidson. "Sustainable Nitrogen Management Index (SNMI): Methodology." University of Maryland Center for Environmental Science (2016).	http://www.umces.edu/sites/default/files/profiles/files/Ranking%20Method_submit_to_SDSN_SNMI_20160705_0.pdf

Appendix II: Indicator lists

The following pages set out the indicators used within each domain, pillar, and element.

Inclusive Societies

Safety and Security

Indicators for War and Civil Conflict (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Two-sided conflict deaths[95]	The death rate from two-sided conflict (either between two non-state actors, or the state and a non-state actor), averaged over the previous five years.	deaths /1,000,000 population*	Uppsala Conflict Data Program	2018	0.5
One-sided conflict deaths	The death rate from one-sided conflict (where the state or a non-state actor has engaged in conflict with civilians), averaged over the previous five years.	deaths /1,000,000 population*	Uppsala Conflict Data Program	2018	0.5
Civil and ethnic war	A magnitude score of episode(s) of civil violence, civil warfare, ethnic warfare and ethnic violence involving that state in that year.	coding, 0-9	Center for Systemic Peace	2017	1
Conflict-driven internal displacement	The rate of conflict or violence driven internal displacement.	people /1,000,000 population*	Internal Displacement Monitoring Center	2018	1
Refugees (origin country)	The proportion of the home country's population living abroad in refugee-like situations.	people /1,000,000 population*	United Nations High Commissioner for Refugees	2018	1

95. The underlying dataset for both conflict death indicators was the UCDP Georeferenced Event Dataset (GED) Global version 19.1, which captures deaths from both intrastate and external conflict.

Indicators for Terrorism (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Terrorism deaths	The death rate from terrorism, averaged over the previous five years.	deaths /1,000,000 population*	Global Terrorism Database	2017	2
Terrorism injuries	The injury rate from terrorism, averaged over the previous five years.	injuries /1,000,000 population*	Global Terrorism Database	2017	1
Terrorism incidents	The terrorism incident rate, averaged over the previous five years.	incidents /1,000,000 population*	Global Terrorism Database	2017	0.5
Property cost of terrorism	An estimate of the property cost of terrorism as a proportion of GDP, averaged over the previous five years.	US $ /billion US 2010 $*	Global Terrorism Database	2017	1

Indicators for Politically Related Terror and Violence (weight = 30%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Political terror	A composite measure of state-sponsored political violence and repression within a country, taking into account disappearances, torture and political violence.	index, 1-5	Amnesty International & US State Department Political Terror Scale	2017	2
Extrajudicial killings	A rating of the degree to which killings by government officials without due process of law have occurred within a country, over the previous year.	coding, 0-2	CIRIGHTS Dataset	2017	1
Use of torture	A rating of the degree to which the purposeful inflicting of extreme pain, either mental or physical, at the instigation of government officials has occurred within a country, over the previous year.	coding, 0-2	CIRIGHTS Dataset	2017	1
Disappearance cases	A rating of the degree to which there have been cases of people disappearing, with likely political motivation and the victim remained unfound, within a country, over the previous year.	coding, 0-2	CIRIGHTS Dataset	2017	1
Political imprisonment	A rating of the degree to which the imprisonment of people due to religious, political, or other beliefs has occurred within a country, over the previous year.	coding, 0-2	CIRIGHTS Dataset	2017	0.5

Indicators for Violent Crime (weight = 25%)[96]

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Intentional homicides	The rate of unlawful homicides purposely inflicted, as a result of domestic disputes, interpersonal violence, violent conflicts over land resources, inter-gang violence over turf or control, and predatory violence and killing by armed groups.	homicides /100,000 population*	World Bank World Development Indicators	2016	2
Dispute settlement through violence	A composite measure of whether people do not resort to violence to redress personal grievances, either with neighbours, strangers, or government officials.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Safety walking alone at night	The percentage of people who responded "Yes" to the survey question: "Do you feel safe walking alone at night in the city or area where you live?"	percentage	Gallup	2018	1
Physical security of women	A composite measure of the physical security of women within a country, encompassing (a) the degree to which women are protected from domestic violence and rape, (b) the degree to which there are taboos or norms preventing these crimes being reported, and (c) the level to which honour killings and femicide occur.	index, 0-4	The WomanStats Project	2014	1

Indicators for Property Crime (weight = 10%)[97]

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Property stolen	The percentage of people who responded "Yes" to the survey question: "Within the last 12 months, have you had money or property stolen from you or another household member?"	percentage	Gallup	2018	2
Business costs of crime and violence	"In your country, to what extent does the incidence of crime and violence impose costs on businesses?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	0.5
Business costs of organized crime[98]	"In your country, to what extent does organized crime (mafia-oriented racketeering, extortion) impose costs on businesses?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1

96. Our expert working group indicated the potential importance of including data on gang related crime within this element, but the lack of suitable data prevented us from doing so.
97. Our expert working group indicated the potential importance of including data on cyber-crime within this element, but the lack of suitable data prevented us from doing so.
98. It's worth noting that whilst the WEF label this indicator as "Organised crime", the specific wording of the question asked discusses mafia-oriented racketeering and extortion, both of which are much narrower than the modern scope of organized crime.

Personal Freedom

Indicators for Agency (weight = 25%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Personal autonomy and individual rights	A rating of the degree to which individuals enjoy freedom of movement, are able to exercise the right to own property and establish private businesses without undue interference, enjoy personal social freedoms, enjoy equality of opportunity and freedom from economic exploitation.	coding, 0-16	Freedom House	2019	1
Due process and rights	A composite measure of whether: (a) suspects are presumed innocent in court, (b) are treated fairly in arrest and pre-trial detention, (c) the use of torture or other abusive treatment, (d) the degree to which legal assistance is offered, and (e) whether jails in the country have adequate living conditions.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Freedom of movement	An assessment of the degree to which citizen's freedom to move internationally or nationally (respectively) is respected or not.	coding, 0-4	CIRIGHTS Dataset	2017	1
Women's agency	A composite measure of the degree to which women experience agency, taking into account 11 different societal, cultural and prevalence variables.[99]	coding, 0-16	The WomanStats Project	2017	1
Freedom from arbitrary interference with privacy	A composite measure of (a) whether government agents are likely to intercept private communications of citizens without warrant, and (b) whether citizens may be arrested without warrant.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Freedom from forced labour	A composite measure, assessing whether adult citizens are free from servitude and other kinds of forced labour.	index, 0-1	Varieties of Democracy	2018	1
Government response to slavery	A composite measure, assessing government progress towards achieving five milestones in preventing and tackling modern day slavery: (a) identifying and supporting survivors, (b) functioning of criminal justice mechanisms for prevention, (c) co-ordination and accountability between national and regional government, (d) addressing of risk factors, and (e) government and business avoidance of goods and services provided by forced labour.	index, -10-100	Global Slavery Index	2018	1
Satisfaction with freedom	The percentage of people who responded "Yes" to the survey question: "Are you satisfied with your freedom to choose what you do with your life?"	percentage	Gallup	2018	1

99. This indicator is the "Patrilineality/Fraternity Syndrome Scale". More details about the variables considered by this indicator, and its calculation can be found on the Womanstats website (https://www.womanstats.org/new/codebook).

Indicators for Freedom of Assembly and Association (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Right to associate and organise	A measure of the degree to which individuals enjoy associational and organizational rights, including (a) assembly, (b) nongovernmental organizations, particularly those that are engaged in human rights and governance-related work, and (c) trade unions and similar organizations.	coding, 0-12	Freedom House	2019	1
Guarantee of assembly and association	A composite measure of whether people can (a) gather together in public and express opinions freely, (b) join community groups and associations, and (c) politically organize in any way they want.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Autonomy from the state	A composite measure of the degree to which citizens experience a society that enjoys autonomy from the state and in which citizens freely and actively pursue their political and civic goals, however conceived.	index, 0-1	Varieties of Democracy	2018	1

Indicators for Freedom of Speech and Access to Information (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Press freedom from government censorship	A composite measure evaluating the legal environment for the media, political pressures that influence reporting, and economic factors that affect access to news and information.	index, 0-100	Freedom House	2016	1
Press freedom from physical repression	A composite measure of press freedom, including (a) of the degree to which there is media pluralism, (b) media independence, (c) the media environment and level of self-censorship, (c) legislative framework, (d) transparency, and (e) the quality of the infrastructure that supports the production of news and information.	index, 0-100	Reporters Without Borders	2018	1
Freedom of opinion and expression	A composite measure of the degree to which people can express political opinions, freedom of the media is respected, freedom of civil and political organization is respected.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Government media censorship	A measure of the degree to which the government directly or indirectly attempt to censor the print or broadcast media.	coding, 0-4	Varieties of Democracy	2018	0.5
Alternative sources of information	A composite measure of the degree to which the media are (a) un-biased in their coverage or lack of coverage of the opposition, (b) allowed to be critical of the regime, and (c) representative of a wide array of political perspectives.	index, 0-1	Varieties of Democracy	2018	1
Political diversity of media perspectives	A measure of the degree to which the major print and broadcast media represent a wide range of political perspectives.	coding, 0-3	Varieties of Democracy	2018	0.5

Indicators for Absence of Legal Discrimination (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Equal treatment and absence of discrimination	A composite measure of whether individuals are likely to be discriminated against in court, at jobs, by police or other institutions based upon their socio-economic status, ethnicity, sexuality, or resident status.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Non-discriminatory civil justice	A composite measure of whether the civil justice system discriminates in practice based on socio-economic status, gender, ethnicity, religion, national origin, sexual orientation, or gender identity.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	0.5
Freedom from hiring and workplace discrimination	A composite measure of whether people are likely to be discriminated against in hiring because of socio-economic, ethnic or other immutable characteristics, and whether they experience discrimination at work.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
LGBT Rights	A scale acting as a proxy for the legal status of LGBT individuals. (0=homosexuality is illegal, 1=legal, 2=civil unions between homosexual individuals are allowed, 3=marriage is legal)	coding, 0-3	International Lesbian, Gay, Bisexual, Trans and Intersex Association	2019	1
Protection of women's workplace, education and family rights	A composite measure of the degree to which women receive protections from discrimination in a society, encompassing numerous factors.[100]	coding, 0-8	The WomanStats Project	2015	1
Freedom of belief and religion	A composite measure of whether non-adherents to religions are required to submit to religious laws, and whether minorities can freely and publicly observe their holy days and religious events.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Government religious intimidation and hostility	A composite measure of the degree to which there is government intimidation or violence motivated by religion, used several subcomponents of Pew's Government Restrictions Index.[101]	index, 0-1	Pew Research Center	2016	1

100. This indicator is composed of two indicators provided by Womanstats - the "Inequity in Family Law/Practice Between Men and Women", and "Discrepancy Between National Law and Practice Concerning Women". More details about the variables considered by this indicator, and its calculation can be found on the Womanstats website (https://www.womanstats.org/new/codebook).

101. The following questions are used from Pew's Governments Restrictions Index, in an arithmetic mean, to create this variable: Q_11, Q_12, Q_13, Q_19, Q_19_Extent, Q_19_Property_Damage, Q_19_Detentions, Q_19_Displacements, Q_19_Abuse, Q_19_Deaths.

Indicators for Social Tolerance (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Perceived tolerance of ethnic minorities	The percentage of people responding "Yes" to the survey question: "Is your city/area a good place to live for ethnic minorities?"	percentage	Gallup	2018	1
Perceived tolerance of LGBT individuals	The percentage of people responding "Yes" to the survey question: "Is your city/area a good place to live for gay/lesbian people?"	percentage	Gallup	2018	1
Perceived tolerance of immigrants	The percentage of people responding "Yes" to the survey question: "Is your city/area a good place to live for immigrants?"	percentage	Gallup	2018	1

Governance

Indicators for Executive Constraints (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Executive powers are effectively limited by the judiciary and legislature	A composite measure of whether executive powers are limited effectively by (a) the judiciary, and (b) the legislature, with twice the weighting given to limitation by the judiciary.	expert survey, 0-3	World Justice Project (Rule of Law Index)	2019	2
Government powers are subject to independent and non-governmental checks	A composite measure of whether government powers are subject to (a) independent auditing and review, and (b) non-governmental checks, with twice the weighting given to independent auditing and review.	expert survey, 0-3	World Justice Project (Rule of Law Index)	2019	1
Transition of power is subject to the law	A composite measure of whether (a) government officials are elected or appointed in accordance with the rules and procedures set forth in the constitution, and (b) integrity of the electoral process, including access to the ballot, the absence of intimidation, and public scrutiny of election results.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Military involvement in rule of law and politics	A composite measure of the military's involvement in politics, which might stem from an external or internal threat, be symptomatic of underlying difficulties, or be a full-scale military takeover.	index, 0-10	Fraser Institute	2016	0.5
Government officials are sanctioned for misconduct	A composite measure of whether government officials in the executive, legislature, judiciary, and the police are investigated, prosecuted, and punished for official misconduct and other violations.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1

Indicators for Political Accountability (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Consensus on democracy and a market economy as a goal	The extent to which major political actors agree on democracy and a market economy as strategic, long-term goals. A high score is awarded if all major political actors agree on establishing or consolidating democracy and a market economy as strategic, long-term goals of transformation. A low score is awarded if there are no major political actors who want to establish democracy or a market economy.	expert judgement, 1-10	Bertelsmann Stiftung Transformation Index	2018	1
Political participation and rights	A measure of the ability to participate in political processes, such as voting in legitimate elections, joining parties, running for office, etc.	coding, 1-7	Freedom House	2019	0.5
Democracy level	A measure of the extent to which a society is autocratic or democratic, including (a) the competitiveness of executive recruitment, (b) constraints on chief executives, (c) regulation of political participation, and (d) competitiveness of political participation.	expert judgement, -10-10	Center for Systemic Peace	2017	1
Complaint mechanisms	A composite measure of whether individuals feel that they have effective complaint mechanisms regarding the government's performance.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1

Indicators for Rule of Law (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Judicial independence	"In your country, how independent is the judicial system from influences of the government, individuals, or companies, from not independent at all, to entirely independent?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Civil justice	A composite measure of the quality of civil justice, covering: (a) its affordability, (b) freedom from discrimination, (c) freedom from improper government influence, and (d) whether it is effectively enforced or subject to unreasonable delay.	expert survey, 0-6	World Justice Project (Rule of Law Index)	2019	3
Integrity of the legal system	A composite measure of the strength and impartiality of the legal system, and the popular observance of the law. (based on the International Country Risk Guide Political Risk Component I for Law and Order.)	index, 0-10	Fraser Institute	2016	2
Efficiency of dispute settlement	"In your country, how efficient are the legal and judicial systems for companies in settling disputes, from extremely inefficient, to extremely efficient?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	0.5

Indicators for Government Integrity (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Use of public office for private gain	A composite measure of the extent to which government officials in the judiciary, executive, police and military, and legislature use public office for private gain. Variables regarding officials in the executive and judicial branches were double weighted.	expert survey, 0-4	World Justice Project (Rule of Law Index)	2019	2
Diversion of public funds	"In your country, how common is illegal diversion of public funds to companies, individuals, or groups, from very commonly occurs, to never occurs?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	0.5
Right to information	A composite measure of whether people have a right to government information that can be accessed reasonably, including: (a) whether requests for information held by a government agency are granted, (b) whether these requests are granted within a reasonable time period, (c) if the information provided is pertinent and complete, (d) if requests for information are granted at a reasonable cost and without having to pay a bribe, (e) whether people are aware of their right to information, and (f) whether relevant records are accessible to the public upon request.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	0.5
Publicised laws and government data	A composite measure of quality and accessibility of information published by the government in print or online; whether laws and information on legal rights are (a) publicly available, (b) presented in plain language, (c) made accessible in all languages; and whether administrative regulations, drafts of legislation, and high court decisions are made accessible to the public in a timely manner.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Transparency of government policy	"In your country, how easy is it for companies to obtain information about changes in government policies and regulations affecting their activities, from extremely difficult, to extremely easy?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	0.5
Budget transparency	A composite measure of the amount and timeliness of budget information governments are making publicly available.	index, 0-100	International Budget Partnership	2017	0.5

Indicators for Government Effectiveness (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Government quality and credibility	A composite measure of the perception of: (a) the quality of public services, (b) the quality of the civil service and the degree of its independence from political pressures, (c) the quality of policy formulation and implementation, and (d) the credibility of the government's commitment to such policies.	index, -2.5 - +2.5	Worldwide Governance Indicators	2017	2
Prioritisation	The extent to which the government sets and maintains strategic priorities, maintains them over extended periods of time, has the capacity to prioritise and organise its policy measures accordingly, and does not rely on ad hoc measures.	expert judgement, 1-10	Bertelsmann Stiftung Transformation Index	2018	1
Efficiency of government spending	"In your country, how efficiently does the government spend public revenue, from extremely inefficient, to extremely efficient in providing goods and services.	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	0.5
Efficient use of assets	The extent to which the government makes efficient use of available human, financial and organisational resources.	expert judgement, 1-10	Bertelsmann Stiftung Transformation Index	2018	1
Implementation	The extent to which a government is effective at implementing its own policies.	expert judgement, 1-10	Bertelsmann Stiftung Transformation Index	2018	1
Policy learning	The extent to which a government demonstrates a pronounced ability of complex learning, and it acts flexibly and replaces failed policies with innovative ones.	expert judgement, 1-10	Bertelsmann Stiftung Transformation Index	2018	1
Policy coordination	The extent to which government coordinates conflicting objectives effectively and acts in a coherent manner, and is not fragmented into rival fiefdoms that counteract each other.	expert judgement, 1-10	Bertelsmann Stiftung Transformation Index	2018	1

Indicators for Regulatory Quality (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Regulatory quality	A composite measure of the perception of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	index, -2.5 - +2.5	Worldwide Governance Indicators	2017	1
Enforcement of regulations	A composite measure of whether government regulations, such as labour, environmental, public health, commercial, and consumer protection regulations, are effectively enforced.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Efficiency of legal framework in challenging regulations	"In your country, to what extent can individuals, institutions (civil society), and businesses obtain justice through the judicial system against arbitrary government decisions, from not at all, to a great extent?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Delay in administrative proceedings	A composite measure of whether administrative proceedings at the national and local levels are conducted without unreasonable delay.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1

Social Capital

Indicators for Personal and Family Relationships (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Help from family and friends when in trouble	The percentage of people responding "Yes" to the survey question: "If you were in trouble, do you have relatives or friends you can count on to help?"	percentage	Gallup	2018	2
Family give positive energy	The percentage of people responding "Strongly Agree/Agree" to the survey question: "Thinking about your life in general 'My family give me positive energy'"	percentage	Gallup	2015	1

Indicators for Social Networks (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Respect	The percentage of people responding "Yes" to the survey question: "Were you treated with respect all day yesterday?"	percentage	Gallup	2018	2
Opportunity to make friends	The percentage of people responding "Yes" to the survey question: "Are you satisfied with opportunities to meet people and make friends?"	percentage	Gallup	2018	1
Helped another household	The percentage of people responding "Yes" to the survey question: "Has your household sent financial help to another household in last year?" (same country)	percentage	Gallup	2018	0.5

Indicators for Interpersonal Trust (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Generalised interpersonal trust	The percentage of people responding "Most people can be trusted" to the question "Generally speaking, would you say most people can be trusted, or you can't be too careful?"[102]	percentage	Integrated Values Survey, Afrobarometer, Arab Barometer, and Latinobarómetro	2018	1
Helped a stranger	The percentage of people responding "Yes" to the survey question: "Have you helped a stranger or someone you didn't know who needed help in past month?"	percentage	Gallup	2018	0.5

102. The Integrated Values Survey (IVS) was taken as the main data source for this indicator as it has the greatest geographical coverage. To cover additional countries, data from regional barometers were calibrated to the results of the IVS by multiplying by adjustment factors based on the countries overlapping in each barometer and the IVS. Adjustment factors for each regional source are calculated as the ratio of percentages reported for countries that are covered both in regional source in question, and the IVS.

Indicators for Institutional Trust (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Confidence in local police	The percentage of people responding "Yes" to the survey question: "Do you have confidence in the local police force?"	percentage	Gallup	2018	2
Public trust in politicians	"In your country, how would you rate the ethical standards of politicians?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	2
Confidence in financial institutions and banks	The percentage of people responding "Yes" to the survey question: "Do you have confidence in financial institutions or banks?"	percentage	Gallup	2018	1
Confidence in judicial system and courts	The percentage of people responding "Yes" to the survey question: "Do you have confidence in the judicial system and courts?"	percentage	Gallup	2018	1
Confidence in national government	The percentage of people responding "Yes" to the survey question: "Do you have confidence in national government?"	percentage	Gallup	2018	1
Confidence in military	The percentage of people responding "Yes" to the survey question: "Do you have confidence in the military?"	percentage	Gallup	2018	0.5

Indicators for Civic and Social Participation (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Donated money to charity	The percentage of people responding "Yes" to the survey question: "Have you donated money to a charity in past month?"	percentage	Gallup	2018	1.5
Voter turnout	A measure of voter turnout (% of registered electors) * democracy score * election occurred in last 7 year. If a country enforced compulsory voting, it is not scored on this indicator.[103]	percentage (adjusted)	International Institute for Democracy and Electoral Assistance	2017	1.5
Volunteering	The percentage of people responding "Yes" to the survey question: "Have you volunteered time to an organisation in past month?"	percentage	Gallup	2018	1
Voiced opinion to a public official	The percentage of people responding "Yes" to the survey question: "In the past month, have you voiced your opinion to a public official?"	percentage	Gallup	2018	0.5

103. As this is a measure of voter turnout used for the Social Capital pillar, countries' voter turnout rate in the most recent national election is multiplied by the democratic level of its political system, according to Polity IV's democracy score. This means the voter turnout indicator can serve as a proxy for the linkage between the ruling group and the electorate. A higher voter turnout in a country where votes do not translate into political representation and participation—for example, Vietnam and China—does not represent a meaningful link between the countries' ruling group and electorate. Multiplication with Polity IV's democracy score means that high voter turnouts matter most for social capital when democracy levels are also high.

Open Economies

Investment Environment[104]

Indicators for Property Rights (weight = 30%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Protection of property rights	"In your country, to what extent are property rights, including financial assets, protected, from not at all, to a great extent?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Lawful process for expropriation	A measure of whether the government: (a) respects the property rights of people and corporations, (b) refrains from the illegal seizure of private property, and (c) provides adequate compensation when property is legally expropriated.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1
Intellectual property protection	"In your country, to what extent is intellectual property protected, from not at all, to a great extent?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	2
Reliability of land infrastructure administration	A composite measure, based on (a) digitisation of land title certificates, (b) functioning of databases for property encumbrances, (c) digitisation of cadastral plans, (d) existence and functioning of a geographic information system, (e) linkage between land ownership registry and mapping agency, and (f) identification process of immovable property.	index, 0-8	World Bank Doing Business Index	2019	1
Procedures to register property	A composite measure of (a) time, (b) cost and (c) number of procedures to register a property.	index, 0-100	World Bank Doing Business Index	2018	1
Regulation of property possession	The extent to which government authorities ensure there are well-defined rights of private property and regulate the acquisition, benefits, use and sale of property.	expert survey, 1-10	Bertelsmann Stiftung Transformation Index	2018	1

104. We originally intended to include a sixth element, "Savings and Wealth Policy" in the Investment Environment pillar, but data constraints prevented us from doing so.

Indicators for Investor Protections (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Strength of insolvency framework	A composite measure of whether insolvency legislation is well designed for rehabilitating viable firms and liquidating nonviable ones, based on: (a) the commencement of proceedings index, (b) management of debtor's assets index, (c) reorganisation proceedings index, and (d) creditor participation index.	index, 0-16	World Bank Doing Business Index	2019	1
Insolvency recovery rate	The cents on the dollar recovered by secured creditors through judicial reorganisation, liquidation, or debt enforcement (foreclosure or receivership) proceedings, accounting for the costs of proceedings and the cost of time taken.	percentage	World Bank Doing Business Index	2019	1.5
Auditing and reporting standards	"In your country, how strong are financial auditing and reporting standards, from extremely weak, to extremely strong?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	2
Extent of shareholder governance	A composite measure of the rights of shareholders in corporate governance: (a) shareholders' rights and role in major corporate decisions, (b) governance safeguards protecting shareholders from undue board control and entrenchment, and (c) transparency on ownership stakes, compensation, audits and financial prospects.	index, 0-10	World Bank Doing Business Index	2019	1
Conflict of interest regulation	A composite measure of the protection of shareholders against directors' misuse of corporate assets for personal gain: (a) transparency of related-party transactions, (b) shareholders' ability to sue and hold directors liable for self-dealing, and (c) access to evidence and allocation of legal expenses in shareholder litigation.	index, 0-10	World Bank Doing Business Index	2019	0.5

Indicators for Contract Enforcement (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Quality of judicial administration	A composite measure of good practices in court system: (a) court structure and proceedings, (b) case management, (c) court automation, and (d) alternative dispute resolution.	index, 0-18	World Bank Doing Business Index	2019	1.5
Time to resolve commercial cases	The average time it takes to take a commercial case through the courts, including the time for filing and service, trial and judgement, and enforcement of a judgement.	days*	World Bank Doing Business Index	2019	1
Legal costs	The percentage of claim value of (a) attorney fees, (b) court costs, and (c) enforcement costs.	percentage*	World Bank Doing Business Index	2019	0.5
Alternative dispute resolution mechanisms	A composite measure of whether alternative dispute resolution mechanisms are (a) accessible, (b) free from improper influence, (c) efficient (not subject to unreasonable delays), and (d) effectively enforced.	expert survey, 0-1	World Justice Project (Rule of Law Index)	2019	1

Indicators for Financing Ecosystem (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Access to finance	The percentage of firms identifying access to, or cost of, finance as a "major" or "very severe" obstacle.	percentage	World Bank Enterprise Surveys	2017	1
Financing of SMEs	"In your country, to what extent can small- and medium-sized enterprises (SMEs) access finance they need for their business operations through the financial sector, from not at all, to a great extent?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Venture capital availability	"In your country, how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding, from extremely difficult, to extremely easy?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Quality of banking system and capital markets	The extent to which a solid banking system and a functioning capital market have been established.	expert survey, 1-10	Bertelsmann Stiftung Transformation Index	2018	1
Commercial bank branches	The number of commercial bank branches (retail locations) per capita.	branches /100,000 adult population*	International Monetary Fund Financial Access Survey	2017	1
Soundness of banks	"In your country, how do you assess the soundness of banks - from extremely low (banks may require recapitalisation), to extremely high (banks are generally healthy with sound balance sheets)?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Depth of credit information	A composite measure of the rules and practices affecting the coverage, scope and accessibility of credit information available through either a credit bureau or a credit registry to facilitate lending decisions.	index, 0-8	World Bank Doing Business Index	2019	0.5

Indicators for Restrictions on International Investment (weight = 10%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Business impact of rules on FDI	"In your country, how restrictive are rules and regulations on foreign direct investment (FDI), from extremely restrictive, to not restrictive at all?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2017	2
Capital controls	The percentage of potential capital controls not levied.	percentage	Fraser Institute	2016	1
Freedom to own foreign currency bank accounts	A composite measure of the extent to which foreign currency bank accounts are permitted, both domestically and abroad.	index, 0-10	Fraser Institute	2016	1
Restrictions on financial transactions	A composite measure of: (a) presence of multiple exchange rates, (b) restrictions on current account transactions, (c) restrictions on capital account transactions, and (d) requirement of the surrender of export proceeds.	index, 0-1	Chinn-Ito Index	2016	1
Prevalence of foreign ownership of companies	"In your country, how prevalent is foreign ownership of companies, from extremely rare, to extremely prevalent?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2017	1
Freedom of foreigners to visit	A composite measure based on the number of countries for which a country requires a visa from foreign visitors for tourist and short-term business purposes.	index, 0-10	Fraser Institute	2016	1

Enterprise Conditions

Indicators for Domestic Market Contestability (weight = 35%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Market-based competition	The extent to which (a) the fundamentals of market-based competition is consistently defined and implemented both macro-economically and micro-economically, (b) there are state-guaranteed rules for market competition with equal opportunities for all market participants, and (c) the informal sector is very small.	expert survey, 1-10	Bertelsmann Stiftung Transformation Index	2018	1
Anti-monopoly policy	The extent to which safeguards (such as comprehensive competition laws) exist to prevent the development of economic monopolies and cartels, and the extent to which they are they enforced	expert survey, 1-10	Bertelsmann Stiftung Transformation Index	2018	1
Extent of market dominance	"In your country, how do you characterise corporate activity, from dominated by a few business groups, to spread among many firms?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1

Indicators for Environment for Business Creation (weight = 30%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Private companies are protected and permitted	The extent to which private companies are permitted are viewed institutionally as primary engines of economic production and are given appropriate legal safeguards, and the extent to which privatisation processes are conducted in a manner consistent with market principles.	expert survey, 1-10	Bertelsmann Stiftung Transformation Index	2018	1
Ease of starting a business	A composite measure based on: (a) cost (including paid-in minimum capital requirement), (b) time, and (c) number of procedures (officially required, or commonly done in practice) to start up and formally operate an industrial or commercial business.	index, 0-100	World Bank Doing Business Index	2018	1
State of cluster development	"In your country, how widespread are well-developed and deep clusters (geographic concentrations of firms, suppliers, producers of related products and services, and specialised institutions in a particular field), from non-existent, to widespread in many fields?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Labour skill a business constraint	The percentage of firms identifying labour skill level as a major or very severe obstacle.	percentage	World Bank Enterprise Surveys	2017	0.5
Availability of skilled workers	"In your country, to what extent can companies find people with the skills required to fill their vacancies, from not at all, to a great extent?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	0.5

Indicators for Burden of Regulation (weight = 25%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Burden of government regulation	"In your country, how burdensome is it for companies to comply with public administration's requirements (e.g., permits, regulations, reporting), from extremely burdensome, to not burdensome at all?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Time spent complying with regulations	The percentage of senior management's time, in a typical week, that is spent dealing with the requirements imposed by government regulations (e.g., taxes, customs, labour regulations, licensing and registration, including dealings with officials, and completing forms).	percentage*	World Bank Enterprise Surveys	2018	1
Number of tax payments	The total number of taxes paid by businesses, including electronic filing.	number per year*	World Bank Doing Business Index	2019	1
Time spent filing taxes	The time taken for a standardised case study company during the second year of operation to prepare, file and pay (a) corporate income tax, (b) value added or sales tax, and (c) labour taxes, including payroll taxes and social contributions.	hours per year*	World Bank Doing Business Index	2019	1
Burden of obtaining a building permit	A composite measure of: (a) time, (b) cost, and (c) number of procedures to obtain a permit to build a warehouse.	index, 0-100	World Bank Doing Business Index	2018	1
Building quality control index	A composite measure of the quality control and safety mechanisms in the construction regulatory system: (a) quality of building regulations, (b) quality control before, during, and after construction, (c) liability and insurance regimes, and (d) professional certifications.	index, 0-15	World Bank Doing Business Index	2019	0.5

Indicators for Labour Market Flexibility (weight = 10%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Cooperation in labour-employer relations	"In your country, how do you characterise Labour-employer relations, from generally confrontational, to generally cooperative?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Flexibility of hiring practices	"In your country, to what extent do regulations allow flexible hiring and firing of workers, from not at all, to a great extent?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	0.5
Redundancy costs	The cost of redundancy, measured in weeks of salary.	weeks*	World Economic Forum Global Competitiveness Index	2018	0.5
Flexibility of employment contracts	A composite measure of how flexible employment contracts are, based on: (a) maximum length of a single fixed term contract, (b) restrictions on overtime work, and (c) whether there are fixed term contracts prohibited for permanent tasks.	index, 0-1	World Bank Doing Business Index	2018	1
Flexibility of wage determination	"In your country, how are wages generally set, from by a centralised bargaining process, to by each individual company?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1

Market Access and Infrastructure

Indicators for Communications (weight = 25%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
International internet bandwidth	The sum of used capacity of all internet exchanges (locations where Internet traffic is exchanged) offering international bandwidth.	kilobits per capita*	International Telecommunications Union	2017	1
2G, 3G and 4G network coverage	A composite measure, based on the average of 2G, 3G and 4G network coverage.	index, 0-100	Groupe Spéciale Mobile Association	2017	2
Fixed broadband subscriptions	Fixed residential and organisational subscriptions to high-speed access to the public Internet, at downstream speeds equal to or greater than, 256 kbit/s (including satellite broadband, fixed WiMAX and any other fixed wireless technologies, excluding connections via mobile-cellular networks).	number /100 population*	International Telecommunications Union	2017	1
Internet usage	The percentage of the population who, in the last three months, have used the internet (via a computer, mobile phone, personal digital assistant, games machine, digital TV etc.)	percentage	International Telecommunications Union	2017	1

Indicators for Resources (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Installed electric capacity	The total net installed capacity of electric power plants, including enterprises that produce electricity, but for whom the production is not their principal activity.	kilowatts per capita*	United Nations Energy Statistics Database	2017	1.5
Ease of establishing an electricity connection	A composite measure based on the average of the normalised scores for: (a) cost to connect to electricity, (b) time required to get electricity, and (c) number of procedures required to get electricity.	index, 0-100	World Bank Doing Business Index	2018	1
Reliability of electricity supply	A composite measure of: (a) system average interruption duration, (b) system average interruption frequency, (c) use of tools to monitor power outages, (d) use of automated tools to restore power supply, (e) whether a regulator monitors the utility's performance on reliability of supply, and (f) whether financial deterrents exist to limit outages.	index, 0-7	World Bank Doing Business Index	2018	1
Gross fixed water assets	The total gross fixed asset value of water production facilities.	USD per population served*	International Benchmarking Network for Water and Sanitation Utilities	2018	1
Water production	The total annual water supplied to the distribution system (including purchased water, if any), expressed by population served per day.	litres per capita per day*	International Benchmarking Network for Water and Sanitation Utilities	2018	0.5
Reliability of water supply	"In your country, how reliable is the water supply (lack of interruptions and flow fluctuations), ranging from extremely unreliable to extremely reliable?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1

Indicators for Transport (weight = 25%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Logistics performance	A composite measure of: (a) quality of trade- and transport-related infrastructure, (b) ease of arranging competitively priced shipments, (c) quality of logistics services, (d) ability to track and trace consignments, and (e) frequency with which shipments reach the consignee within the scheduled time.	index, 1-5	World Bank Logistics Performance Index	2016	1.5
Airport connectivity	A composite measure of the connectivity to the global air transport network available in each country. The score is based on the number of available seats on flights originating within the country, and weighted by the size (in terms of the number of passengers handled) of the destination airports, and normalised by the population of the origin country.	index, 0-500*	World Economic Forum Global Competitiveness Index	2018	2
Efficiency of seaport services	"In your country, how efficient (i.e., frequency, punctuality, speed, price) are seaport services (ferries, boats) (for landlocked countries: assess access to seaport services), from extremely inefficient - among the worst in the world, to extremely efficient - among the best in the world?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	2
Liner shipping connectivity	A composite measure capturing how well countries are connected to global shipping networks: (a) number of ships, (b) their container-carrying capacity, (c) maximum vessel size, (d) number of services, and (e) number of companies that deploy container ships in a country's ports.	index, rebased to 100 in 2004*	United Nations Trade Data	2018	0.5
Quality of roads	"In your country, how is the quality (extensiveness and condition) of road infrastructure, from extremely poor - among the worst in the world, to extremely good - among the best in the world?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Road density[105]	The density of a country's road network, including motorways, highways, and main or national roads, secondary or regional roads, and all other roads.	km /100 sq km of land area*	Food and Agriculture Organisation	2011	0.5
Rail density	The density of a country's rail network based on length of railway route available for train service, irrespective of the number of parallel tracks.	km per sq km of land area*	International Union of Railways	2017	0.5

105. Countries with low population density can be scored poorly for this indicator, due to concentration of roads in urban areas. In countries such as Australia, where the population is heavily concentrated in a very small area (relative to the size of the country), the functional density will be higher than these data suggest.

Indicators for Border Administration (weight = 5%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Efficiency of customs clearance process	The efficiency of customs clearance processes, based on speed, simplicity and predictability of formalities.	survey, 1-5	World Bank Logistics Performance Index	2016	1.5
Time to comply with border regulations and procedures	The time associated with compliance with regulations relating to customs and to other inspections that are mandatory in order for the shipment to cross the economy's border (import and export), as well as the time for handling that takes place at its port or border.	hours*	World Bank Doing Business Index	2018	1
Cost to comply with border regulations and procedures	The cost associated with compliance with regulations relating to customs and to other inspections that are mandatory in order for the shipment to cross the economy's border (import and export), as well as the time for handling that takes place at its port or border.	USD (current)*	World Bank Doing Business Index	2018	0.5

Indicators for Open Market Scale (weight = 5%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Domestic and international market access for goods	A composite measure of (a) the GDP of the economies with which a country has a free trade agreement for goods, and (b) GDP of the domestic economy, weighted double to take into account the ease of trading domestically compared with overseas markets. Expressed as a proportion of world GDP.	percentage of global GDP	World Trade Organisation	2018	1.5
Domestic and international market access for services	A composite measure of (a) the GDP of the economies with which a country has a free trade agreement for services, and (b) GDP of the domestic economy, weighted double to take into account the ease of trading domestically compared with overseas markets. Expressed as a proportion of world GDP.	percentage of global GDP	World Trade Organisation	2018	2
Trade-weighted average tariff faced in destination markets	The average of applied destination tariff rates levied on merchandise goods (including preferential rates that the rest of the world applies to each country), weighted by the trade patterns of the importing country's reference group.	percentage	World Economic Forum Global Competitiveness Index	2016	0.5
Margin of preference in destination markets	A composite measure based on the average of: (a) trade-weighted average difference between the MFN tariff and the most advantageous preferential duty (advantage score), and (b) the ratio of the advantage score to the trade-weighted average MFN tariff level.	index, 1-100	World Economic Forum Global Competitiveness Index	2016	0.5

Indicators for Import Tariff Barriers (weight = 5%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Share of imports free from tariff duties	The share of trade, excluding petroleum, that is imported free of tariff duties, taking into account MFN tariffs and preferential agreements.	percentage	World Economic Forum Global Competitiveness Index	2016	1.5
Average applied tariff rate	The trade-weighted average of all the applied tariff (custom duty) rates on imports of merchandise goods, including preferential rates that a country applies to the rest of the world.	percentage	World Economic Forum Global Competitiveness Index	2016	2
Complexity of tariffs	A composite measure of: (a) tariff dispersion, (b) specific tariffs, and (c) number of distinct tariffs.	index, 1-7	World Economic Forum Global Competitiveness Index	2016	0.25

Indicators for Market Distortions (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Extent of liberalisation of foreign trade	The extent to which foreign trade has been liberalised, with uniform, low tariffs and few non-tariff barriers.	expert survey, 1-10	Bertelsmann Stiftung Transformation Index	2018	1
Prevalence of non-tariff barriers	"In your country, to what extent do non-tariff barriers (e.g., health and product standards, technical and labelling requirements, etc.) limit the ability of imported goods to compete in the domestic market, from strongly limit, to do not limit at all?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Non-tariff measures	The number of non-tariff measures that can potentially have an effect on international trade in goods, including sanitary and phytosanitary, technical barriers to trade, pre-shipment inspection, contingent trade protective measures, quantity control measures, price control measures, other measures, and export-related measures.	number*	United Nations Trade Data	2018	0.25
Distortive effect of taxes and subsidies	"In your country, to what extent do fiscal measures (subsidies, tax breaks, etc.) distort competition, from distort competition to a great extent, to do not distort competition at all?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Energy subsidies	The scale of consumer and producer subsidies for energy.	percentage of GDP*	International Monetary Fund	2015	0.25

Economic Quality

Indicators for Fiscal Sustainability (weight = 25%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Government budget balance	The government budget balance, as a percentage of GDP.	percentage	International Monetary Fund World Economic Outlook	2016	1
Government debt	The gross government debt, (consisting of all liabilities that require payment or payments of interest and/or principal by the debtor to the creditor at a date or dates in the future), as a percentage of GDP.	percentage	International Monetary Fund	2019	1.5
Country credit rating	An average of S&P, Moody's, Fitch and DBRS ratings of country credit ratings, standardised to a score out of 100.	score, 0-100	Trading Economics	2019	0.5
Country risk premium	The additional return or premium demanded by investors to compensate them for the higher risk associated with investing in a country.	percentage	Aswath Damodaran	2018	1.5
Gross savings	Gross national income less total consumption, plus net transfers, as a percentage of GDP.	percentage	World Bank World Development Indicators	2018	1

Indicators for Macroeconomic Stability (weight = 10%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
GDP per capita growth	Annual percentage growth rate of GDP per capita based on constant local currency, averaged over the previous five years.	percentage	World Bank World Development Indicators	2018	1
Inflation volatility	Yearly percentage change in the end of period inflation rate, averaged over the previous five years.	percentage*	International Monetary Fund	2019	1

Indicators for Productivity and Competitiveness (weight = 30%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Labour productivity	The GDP output per worker in the workforce (population in employment).	2011 US $ PPP*	International Labour Organisation	2019	1
Economic complexity	A composite measure of the productive capabilities of large economic systems, based on both (a) the diversity of countries that are exported to, and (b) the ubiquity of products exported.[106]	index, -3-3	Economic Complexity Index	2017	1.5
Export quality	A composite measure estimating a country's export quality, based on both the (a) value, and (b) quantity, of bilateral trades.	index, 0-1.2	International Monetary Fund	2010	1
High-tech manufactured exports	The value of manufactured exports with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery, expressed as a percentage of the value of all manufactured exports.	percentage*	United Nations Comtrade Database	2018	1

Indicators for Dynamism (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
New business density	The number of newly registered limited liability corporations per calendar year.	number /100 working age population*	World Bank Enterprise Surveys	2016	1
Patent applications	The rate of applications for the exclusive rights to an invention, covering both products and processes as inventions.	applications /1,000,000 population*	World Intellectual Property Organisation	2017	0.5
Capacity to attract talented people	"Does your country attract talented people from abroad?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1

106. The ECI in its strict mathematical definition is defined in terms of an eigenvector of a matrix connecting countries to countries (based on whether one country exports to the other, and the ubiquity of those exports). A full definition of the computation of the ECI can be found at https://oec.world/en/resources/methodology/.

Indicators for Labour Force Engagement (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Labour force participation	The percentage of the working-age population (aged 15-64) that are economically active, either by working, or looking for work.	percentage	International Labour Organisation	2018	1
Female labour force participation	The percentage of the female working-age population (aged 15-64) that are economically active, either by working, or looking for work.	percentage	International Labour Organisation	2018	0.5
Waged and salaried workers	The percentage of the workforce (those working) who are in waged and salaried roles.	percentage	International Labour Organisation	2018	1.5
Unemployment	The percentage of the labour force (those who are working or looking for work) that are not employed.	percentage*	International Labour Organisation	2018	1
Youth unemployment	The percentage of the youth labour force (those aged 16-24 working or looking for work) that are not employed.	percentage*	International Labour Organisation	2018	0.5

Empowered People

Living Conditions

Indicators for Material Resources (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Poverty rate at national poverty lines	The percentage of the population living below the national poverty lines.[107]	percentage	World Bank World Development Indicators	2018	0.5
Poverty rate at $1.90 a day	The percentage of the population living on less than $1.90 a day, at 2011 PPP international prices.	percentage	World Bank World Development Indicators	2017	1
Poverty rate at $3.20 a day	The percentage of the population living on less than $3.20 a day, at 2011 PPP international prices.	percentage	World Bank World Development Indicators	2017	1
Poverty rate at $5.50 a day	The percentage of the population living on less than $5.50 a day, at 2011 PPP international prices.	percentage	World Bank World Development Indicators	2017	1
Households with a refrigerator	The percentage of households with a refrigerator.	percentage	Global Data Lab	2017	1
Ability to source emergency funds	The percentage of respondents reporting that in the case of an emergency it is not possible for them to come up with 1/20 of gross national income per capita in local currency within the next month.	percentage	World Bank Global Financial Inclusion	2017	1
Ability to live on household income	The percentage of people who responded "getting by on present income/living comfortably" to the survey question: "Which phrase comes closest to your feelings about your household income?"[108]	percentage	Gallup	2018	1

107. National poverty rates differ between different countries, so this indicator has the trade-off between utilising a measure of relative poverty, and applying comparisons between different measurements.

108. The wording of the survey question appears here slightly altered from the original, and five responses ranging from "Living comfortably on present income" to "Finding it very difficult on present income" were offered as possible responses.

Indicators for Nutrition (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Availability of adequate food	The percentage of people who responded "Yes" to the survey question: "Have there been times in the past 12 months when you did not have enough money to buy food that you or your family needed?"	percentage	Gallup	2018	1
Prevalence of undernourishment	The percentage of the population whose food intake is insufficient to meet dietary energy requirements continuously.	percentage	Food and Agriculture Organisation	2016	1
Prevalence of wasting in children under-5	The percentage of children under age 5 whose weight for height is more than two standard deviations below the median for the international reference population ages 0-59 months.	percentage	World Bank World Development Indicators	2017	1
Prevalence of stunting in children under-5	The percentage of children under age 5 whose height for age is more than two standard deviations below the median for the international reference population ages 0-59 months.	percentage	World Bank World Development Indicators	2017	1

Indicators for Basic Services (weight = 10%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Access to electricity	The percentage of population with relatively simple and stable access to electricity.	percentage	World Bank World Development Indicators	2017	1
Access to basic water services	The percentage of people using at least basic water services from an improved source, provided collection time is not more than 30 minutes for a round trip.	percentage	WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation	2015	1
Access to piped water	The percentage of the population with a water service pipe connected with in-house plumbing to one or more taps or a piped water connection to a tap placed in the yard or plot outside the house.	percentage	WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation	2017	1
Access to basic sanitation services	The percentage of people using at least improved sanitation facilities that are not shared with other households.	percentage	WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation	2015	1
Unsafe water, sanitation or hygiene	The rate of age-standardised disability adjusted life years lost from unsafe water, sanitation, and hygiene.	DALYs /100,000 population	Institute for Health Metrics and Evaluation	2017	1

Indicators for Shelter (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Availability of adequate shelter	The percentage of people who responded "Yes" to the survey question: "Have there been times in the past 12 months when you did not have enough money to provide adequate shelter or housing for you and your family?"	percentage	Gallup	2018	1
Housing deprivation	The percentage of households deprived in the quality of roofing, walls or flooring; if the household has no walls or if the wall is made of natural, rudimentary or other unidentified materials, if the household has no roof or if the roof is made of natural, rudimentary or other unidentified materials, or if there is a natural floor.	percentage	Oxford Poverty and Human Development Initiative	2018	1
Access to clean fuels and technologies for cooking	The percentage of the total population primarily using clean cooking fuels and technologies for cooking.	percentage	World Bank World Development Indicators	2016	1
Indoor air quality	The rate of age-standardised disability adjusted life years lost from indoor air pollution from household use of solid fuels.	DALYs /100,000 population	Institute for Health Metrics and Evaluation	2017	1

Indicators for Connectedness (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Access to a bank account	The percentage of respondents (aged 15+) who reported having an account at a bank or another type of financial institution or reported personally using a mobile money service during the past 12 months.	percentage	World Bank Global Financial Inclusion	2017	1
Use of digital payments	The percentage of respondents (aged 15+) who reported using mobile money, a debit or credit card, or a mobile phone to make a payment, or using the internet to pay bills or to buy something online, during the past 12 months.	percentage	World Bank Global Financial Inclusion	2017	1
Access to a cellphone	The percentage of households with a cellphone.	percentage	Global Data Lab	2017	1
Rural access to roads[109]	The percentage of rural people who live within two kilometres of an all-season road. An "all-season road" is a road that is motorable all year round by the prevailing means of rural transport.	percentage	Rural Access Index	2004	0.5
Satisfaction with public transportation	The percentage of people who responded "Yes" to the survey question: "In the city or area where you live, are you satisfied or dissatisfied with the public transportation systems?"	percentage	Gallup	2018	0.5
Satisfaction with roads and highways	The percentage of people who responded "Yes" to the survey question: "In the city or area where you live, are you satisfied or dissatisfied with the roads and highways?"	percentage	Gallup	2018	0.5

109. Whilst the latest data for this indicator is currently 2004, an updated Rural Access Index is being piloted by the World Bank. We were unable to use the updated indicator in this year's Index, as the current country coverage is <20 countries.

Indicators for Protection from Harm (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Death and injury from road traffic accidents	The rate of age-standardised disability adjusted life years lost due to road injuries (pedestrian road injuries, cyclist road injuries, motorcyclist road injuries, motor vehicle road injuries and other road injuries).	DALYs /100,000 population	Global Burden of Disease study	2017	1
Death and injury from forces of nature[110]	The rate of age-standardised disability adjusted life years lost due to forces of nature.	DALYs /100,000 population*	Institute for Health Metrics and Evaluation	2017	0.5
Unintentional death and injury	The rate of age-standardised disability adjusted life years lost from unintentional injuries, excluding the adverse effects of medical treatment, and exposure to forces of nature.	DALYs /100,000 population	Global Burden of Disease study	2017	0.5
Occupational mortality	The rate of fatal occupational accidents in the labour force.	deaths /100,000 labour force population	International Labour Organisation	2010	0.5

110. This indicator is not normalised by the total number of natural disasters and so captures both the extent of natural disasters in a country, and the infrastructure that protects the population from these events.

Health

Indicators for Behavioural Risk Factors (weight = 10%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Obesity	The percentage of the adult population who have obesity.	percentage	World Health Organisation (Global Dementia Observatory)	2016	1
Smoking	The percentage of the 15+ population who currently smoke any tobacco product on a regular basis.	percentage	World Health Organisation	2016	1
Substance use disorders	The age-standardised prevalence of adults with a substance use disorder, including alcohol, opioid, cocaine, amphetamine, cannabis and other drug use.	number /100,000 population	Global Burden of Disease study	2017	1

Indicators for Preventative Interventions (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Diphtheria immunisation	The percentage of children aged 12-23 months who received DPT vaccinations before 12 months or at any time before the survey.	percentage	World Health Organisation	2017	1
Measles immunisation	The percentage of children aged 12-23 months who received the measles vaccination before 12 months or at any time before the survey.	percentage	World Health Organisation	2017	1
Hepatitis immunisation	The percentage of children aged 12-23 months who received hepatitis B vaccinations before 12 months, or at any time before the survey.	percentage	World Health Organisation	2017	1
Contraceptive prevalence	The percentage of women who are practicing, or whose sexual partners are practicing, at least one modern method of contraception.	percentage	United Nations International Children's Emergency Fund	2018	1
Antenatal care coverage	The percentage of women aged 15-49 years who were attended to at least once during pregnancy by a skilled health personnel (doctor, nurse or midwife).	percentage	United Nations International Children's Emergency Fund	2017	1
Existence of national screening programs	A composite measure of whether a country has a national screening program for cervix cancer, breast cancer and HbA1c testing.	index, 0-1	World Health Organisation	2017	0.5

Indicators for Care Systems (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Healthcare coverage	The percentage of population without healthcare coverage, either through private insurance, or state-provided coverage (regardless of whether they are able to effectively access healthcare through that coverage).	percentage	International Labour Organisation	2011	0.5
Health facilities	A composite measure based on, (a) the density of hospitals, (b) density of mental hospitals, (c) hospital beds per capita and (d) density of mental outpatient facilities.	index, 0-0.3	World Health Organisation	2018	1
Health practitioners and staff	A composite measure based on, (a) the concentration of physicians, (b) concentration of dentists and (c) the concentration of nurses and midwives, amongst the adult population.	index, 0-1	World Health Organisation	2018	1
Births attended by skilled health staff	The percentage of births attended by personnel trained to give the necessary supervision, care, and advice to women during pregnancy, labour, and the postpartum period.	percentage	United Nations International Children's Emergency Fund	2018	1
Tuberculosis treatment coverage	The percentage of tuberculosis cases that are treated.	percentage	World Health Organisation	2017	0.5
Antiretroviral HIV therapy	The percentage of adults and children on antiretroviral therapy among all adults and children living with HIV.	percentage	Joint United Nations Programme on HIV and AIDS	2017	1
Satisfaction with healthcare	The percentage of people who responded "Yes" to the survey question: "In the city or area where you live, are you satisfied or dissatisfied with the availability of quality healthcare?"	percentage	Gallup	2018	1

Indicators for Mental Health (weight = 10%)[111]

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Emotional wellbeing	A composite measure, based on the percentages of people reporting that they (a) didn't experience sadness, (b) didn't experience stress, and (c) did experience enjoyment over the previous day.	index, 0-1	Gallup	2018	0.5
Depressive disorders	The age-standardised rate of years lived with disability from depressive disorders.	years /100,000 population	Global Burden of Disease study	2017	1
Suicide	The age-standardised death rate from suicide.	deaths /100,000 population	World Health Organisation	2016	1

111. The Mental Health element was down-weighted after discussion with external experts, following concerns over the quality of available global data, despite this element being seen as of equal importance as physical health.

Indicators for Physical Health (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Physical pain	The percentage of people who responded "Yes" to the survey question: "Did you experience the following feelings during a lot of the day yesterday? How about physical pain?"	percentage	Gallup	2018	0.5
Health problems	The percentage of people who responded "Yes" to the survey question: "Do you have any health problems that prevent you from doing any things people your age normally can do?"	percentage	Gallup	2018	0.5
Communicable diseases[112]	The age-standardised rate of years lived with disability from communicable diseases, excluding maternal and neonatal disorders, and nutritional deficiencies.	years /100,000 population	Global Burden of Disease study	2017	2
Non-communicable diseases	The age-standardised rate of years lived with disability from non-communicable diseases, excluding mental disorders and substance use disorders.	years /100,000 population	Global Burden of Disease study	2017	0.5
Raised blood pressure[113]	The percentage of the 18+ population with raised blood pressure.	percentage	World Health Organisation	2015	0.5

Indicators for Longevity (weight = 30%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Maternal mortality	The rate of women who die from pregnancy-related causes while pregnant, or within 42 days of pregnancy termination per 100,000 live births.	deaths /100,000 live births	World Bank World Development Indicators	2015	1
Under 5 mortality	An estimate of the proportion of current new-borns who will not survive until age 5, based on the age-specific death rates for the age groups between 0 and 5.	number /1,000 newborns	World Bank World Development Indicators	2017	1
5-14 mortality	An estimate of the proportion of current 5 year olds who will not survive until age 14, based on the age-specific death rates for the age groups between 5 and 14.	number /1,000 5 year-olds	United Nations Inter-agency Group for Child Mortality Estimation	2017	0.5
15-60 mortality	An estimate of the proportion of current 15 year olds who will not survive until age 60, based on the age-specific death rates for the age groups between 15 and 60.	number /1,000 15-year olds	World Bank World Development Indicators	2017	2
Life expectancy at 60	The average expected remaining years of life left at age 60, based on current mortality rates.	years	World Health Organisation	2016	1

112. Expert advisors felt it was worth noting that countries with effective health care systems are likely to report more accurate figures for prevalence of diseases (both communicable and non-communicable), whereas poorly functioning health systems may under-report prevalence figures.
113. It's worth noting that raised blood pressure is already counted under non-communicable diseases, but expert advice was that this was important enough in its own right to be included as a separate indicator.

Education

Indicators for Pre-Primary Education (weight = 5%)[114]

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Pre-primary enrolment	The percentage of pre-primary aged children enrolled in pre-primary education.	percentage	UNESCO Institute for Statistics	2018	1

Indicators for Primary Education (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Primary enrolment	The percentage of primary aged children enrolled in primary education.	percentage	UNESCO Institute for Statistics	2018	1
Primary completion	The rate of primary education completion, as a percentage of the primary education graduation age group.[115]	percentage	UNESCO Institute for Statistics	2018	1
Primary education quality	The mean score of harmonised learning outcomes at the primary level for the years 1965-2015.	score, 0-625	Altinok, N., N. Angrist and H.A. Patrinos. 2018. "Global data set on education quality (1965-2015)."	2015	0.5

114. Lack of sufficient data for both quality and completion rates at the pre-primary level meant pre-primary enrolment was the only indicator that could be included for this element, and expert advice led to the subsequent down weighting of the pre-primary education element due to this data sparsity.
115. Individuals who graduate primary education in a specific year, but are not in the primary graduation age cohort are still counted in the total number of graduates.

Indicators for Secondary Education (weight = 30%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Secondary school enrolment	The percentage of secondary aged children enrolled in secondary education.	percentage	UNESCO Institute for Statistics	2018	1
Lower-secondary completion	The rate of lower-secondary education completion, as a percentage of the lower-secondary education graduation age group.[116]	percentage	UNESCO Institute for Statistics	2018	1
Access to quality education	A composite measure of the degree to what extent high quality basic education is guaranteed to all, being sufficient to enable them to exercise their basic rights as adult citizens.	index, 0-4	Varieties of Democracy	2018	1
Secondary education quality	The average of learning outcomes across maths, reading, and science at both the primary and secondary level of education.	score, 0-625	Altinok, N., N. Angrist and H.A. Patrinos. 2018. "Global data set on education quality (1965-2015)."	2015	2

Indicators for Tertiary Education (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Tertiary enrolment	The ratio of total tertiary enrolment, regardless of age, to the population of the official tertiary level age group.	percentage	UNESCO Institute for Statistics	2018	1
Tertiary completion	The rate of tertiary education completion, as a percentage of the tertiary education graduation age group.[117]	percentage	UNESCO Institute for Statistics	2018	1
Average quality of higher education institutions	A composite measure, made from the score given to the top-1000 universities in the QS World University Rankings and TES Higher Education World University Rankings, normalised by number of higher education institutions in the country.[118]	index, 0-1*	QS World University Rankings and TES University Rankings	2019	0.5
Skillset of university graduates	"In your country, to what extent do graduating students from university possess the skills needed by businesses?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1
Quality of vocational training	"In your country, how do you assess the quality of vocational training?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	1

116. Individuals who graduate lower-secondary education in a specific year, but are not in the lower-secondary graduation age cohort are still counted in the total number of graduates.
117. Individuals who graduate tertiary education in a specific year, but are not in the tertiary graduation age cohort are still counted in the total number of graduates.
118. A score of 0-4 is given to each university in the country (1-50 is given 4, 51-150 is given 3, 151-350 is given 2, 351-700 is given 1, 701-1000 is given 0.25), depending on that university's rank according to QS' Rankings, and TES' Rankings. Scores are totalled for the country and divided by the overall number of higher education institutions in that country.

Indicators for Adult Skills (weight = 25%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Adult literacy	The percentage of people ages 15 and above who can both read and write to such a degree that they are able to understand a short simple statement about their everyday life.	percentage	UNESCO Institute for Statistics	2018	1
Education level of adult population	A composite measure based on, (a) the percentage of the population without any education, (b) the proportion of workers with secondary education, and (c) the proportion of workers with tertiary education.	index, 0-1	Barro and Lee dataset	2018	1
Women's average years in school	The average number of years of primary, secondary or tertiary education attended by women aged between 25 and 34 years old.	years	Institute for Health Metrics and Evaluation	2015	1
Education inequality	The gini co-efficient of education distribution among 15+ population, accounting for average years of schooling among the population.	index, 0-1	Castello-Climent and Domenech (2012)	2010	0.5
Digital skills among population	"In your country, to what extent does the active population possess sufficient digital skills (e.g. computer skills, basic coding, digital reading)?"	expert survey, 1-7	World Economic Forum Global Competitiveness Index	2018	0.5

Natural Environment

Indicators for Emissions (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
CO2 emissions	A composite measure of the total level of CO2 emissions of a country, normalised by share of world GDP and population, based off 1990 global emission levels.[119]	index, 0-1*	Carbon Dioxide Information Analysis Center	2014	1
SO2 emissions	A composite measure of the total level of SO2 emissions of a country, normalised by share of world GDP and population, based off 1990 global emission levels.	index, 0-1*	Emissions Database for Global Atmospheric Research	2012	0.5
NOx emissions	A composite measure of the total level of NOx emissions of a country, normalised by share of world GDP and population, based off 1990 global emission levels.	index, 0-1*	Emissions Database for Global Atmospheric Research	2012	0.5
Black carbon emissions	A composite measure of the total level of black carbon emissions of a country, normalised by share of world GDP and population, based off 1990 global emission levels.	index, 0-1*	Emissions Database for Global Atmospheric Research	2012	0.5
Methane emissions	A composite measure of the total level of methane emissions of a country, normalised by share of world GDP and population, based off 1990 global emission levels.	index, 0-1*	Emissions Database for Global Atmospheric Research	2012	0.5

Indicators for Exposure to Air Pollution (weight = 15%)[120]

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Exposure to fine particulate matter	The percentage of the population whose exposure to PM2.5 is above the World Health Organization thresholds.	percentage	Yale and Columbia Universities (Environmental Performance Index)	2015	2
Health impact of air pollution	The rate of age standardised disability adjusted life years lost from exposure to PM2.5 pollution, excluding household air pollution.	DALYs /100,000 population	Institute for Health Metrics and Evaluation	2017	2
Satisfaction with air quality	The percentage of people responding "Yes" to the survey question: "In the city or area where you live, are you satisfied or dissatisfied with the quality of air?"	percentage	Gallup	2018	0.5

119.All indicators in this element are composed from two underlying variables, one considering the level of emissions when normalised by the share of world GDP, and one when normalised by share of world population.

120.It is worth noting that indicators within this element are negative externalities of the exposure the air pollution, whereas an indicator on indoor air pollution is contained in the Shelter element of the Living Conditions pillar, as it may be avoided by, for example, better household ventilation and the use of cleaner cooking fuels.

Indicators for Forest, Land and Soil (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Forest area	The percentage of total land area that is covered by forest.	percentage	Food and Agriculture Organisation	2016	1
Flood occurrence	A composite measure based on the number of occurrences of floods within a country between 1985 and 2011.	index, 0-5	World Resources Institute	2011	1
Sustainable nitrogen management	A composite measure assessing the sustainable nitrogen management of a country, based on two components: (a) Nitrogen Use Efficiency, and (b) Yield. The index considers how far a countries performance in these two components is from two "optimal" levels of performance.[121]	index, 0-√2	Zhang, Xin, and Eric Davidson. "Sustainable Nitrogen Management Index (SNMI): Methodology." University of Maryland Center for Environmental Science (2016).	2015	1

Indicators for Freshwater (weight = 20%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Renewable water resources	The long-term average annual flow of rivers (surface water) and groundwater per capita.	m^3 per capita*	Food and Agriculture Organisation	2017	1
Wastewater treatment	The percentage of collected, generated, or produced wastewater that is treated.	percentage	Yale and Columbia Universities (Environmental Performance Index)	2016	1
Freshwater withdrawal	The domestic freshwater withdrawal, as a percentage of renewable resources.	percentage	Food and Agriculture Organisation	2014	1
Satisfaction with water quality	The percentage of people responding "Yes" to the survey question: "In the city or area where you live, are you satisfied or dissatisfied with the quality of water?"	percentage	Gallup	2018	1

121. The SNMI uses ideal Nitrogen Use Efficiency (NUE) as 1, and ideal Yield as 90kg N/ha/yr, and is based on the Euclidean distance of a countries position in each component from these optimal thresholds.

Indicators for Oceans (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Overexploitation of fish stocks	The percentage of fish stocks overexploited and collapsed.	percentage	Yale and Columbia Universities (Environmental Performance Index)	2014	1
Stability of marine biodiversity	A composite measure of the overexploitation of fish stocks, and health of marine ecosystems, based on the change in the mean trophic level of fish caught by a country since 1950.[122]	index, 0-100	Yale and Columbia Universities (Environmental Performance Index)	2014	1
Clean ocean water	A composite measure of the degree to which ocean regions are free of contaminants such as: (a) chemicals, (b) eutrophication, (c) human pathogens, and (d) trash.	index, 0-100	Ocean Health Index	2015	1

Indicators for Preservation Efforts (weight = 15%)

Name	Description	Unit (* = Logged)	Source	Last Update	Weight
Terrestrial protected areas	The percentage of total land area that is at least partially protected, designated by national authorities as scientific reserves with limited public access, national parks, natural monuments, nature reserves or wildlife sanctuaries, protected landscapes, and areas managed mainly for sustainable use.	percentage	World Database on Protected Areas	2018	1
Marine protected areas	The percentage of territorial waters that have been reserved by law, or other effective means to protect part or all of the enclosed environment.	percentage	World Database on Protected Areas	2018	1
Long term management of forest areas	The percentage of forest area with a long-term management plan.	percentage	Food and Agriculture Organisation	2010	1
Protection for biodiverse areas[123]	A composite measure based on the proportion of key biodiverse areas that are covered as protected areas, based on three types of biodiverse areas: (a) terrestrial, (b) freshwater, and (c) marine.	index, 0-1	UN Environment World Conservation Monitoring Centre	2019	1
Pesticide regulation	A composite measure of whether countries allow, restrict, or ban the 'Dirty Dozen' Persistent Organic Pollutants (POPs).	index, 0-25	Yale and Columbia Universities (Environmental Performance Index)	2012	1
Satisfaction with preservation efforts	The percentage of people responding "Yes" to the survey question: "Are you satisfied with efforts to preserve the environment?"	percentage	Gallup	2018	1

122. Using data presented in the EPI on stability of the Regional Marine Trophic Index over time.
123. For landlocked countries, the average of terrestrial and freshwater protections were used instead.

Appendix III: Breakdown of new and existing indicators used

Table 4: New and existing indicators used in the 2019 Prosperity Index

Domain	Pillar	No. of Elements	No. of Indicators	Indicator Breakdown	
				New for 2019	Brought forward from 2018 PI (2018 Pillar)
Inclusive Societies	Safety & Security	5	21	11	10 (Safety & Security)
	Personal Freedom	5	27	19	8 (Personal Freedom)
	Social Capital	5	17	6	10 (Social Capital), 1 (Governance)
	Governance	6	30	23	7 (Governance)
Open Economies	Investment Environment	5	28	24	4 (Business Environment)
	Enterprise Conditions	4	19	15	3 (Business Environment), 1 (Economic Quality)
	Economic Quality	5	19	13	6 (Economic Quality)
	Market Access & Infrastructure	7	32	28	3 (Business Environment), 1 (Economic Quality)
Empowered People	Living Conditions	6	30	21	4 (Econ Quality), 1 (Health), 1 (Natural Environment), 3 (Safety & Sec)
	Health	6	29	18	11 (Health)
	Education	5	18	12	6 (Education)
	Natural Environment	6	24	16	8 (Natural Environment)
	Total	**65**	**294**	**206**	**88**

Appendix IV: Summary statistics for pillars and elements

Table 5: Pillar Summary Statistics

Pillar	Mean	Minimum Value	Maximum Value	Standard Deviation	Pearson correlation with		
					Productive Capacity	Cantril's Ladder	Prosperity Index score
Safety & Security	67.6	19.2	94.0	17.2	0.65	0.63	0.80
Personal Freedom	53.4	11.3	94.6	19.8	0.61	0.62	0.77
Governance	52.2	18.0	90.4	17.1	0.84	0.72	0.94
Social Capital	51.1	22.3	77.5	9.4	0.61	0.67	0.71
Investment Environment	54.5	23.6	87.7	15.4	0.87	0.75	0.95
Enterprise Conditions	56.9	21.7	90.8	15.1	0.83	0.68	0.92
Market Access & Infrastructure	49.7	17.8	84.8	17.9	0.93	0.78	0.95
Economic Quality	49.4	19.9	79.7	13.9	0.87	0.75	0.91
Living Conditions	69.7	21.2	97.1	19.9	0.91	0.80	0.90
Health	68.3	34.0	86.6	11.9	0.81	0.74	0.85
Education	58.7	15.2	90.7	20.0	0.88	0.75	0.91
Natural Environment	56.0	35.1	77.5	8.5	0.57	0.57	0.66

Table 6(a): Inclusive Societies Element Summary Statistics

Pillar	Element (Weight)	Mean	Minimum Value	Maximum Value	Standard Deviation	Pearson correlation with		
						Productive Capacity	Cantril's Ladder	Prosperity Index score
Safety and Security	War and Civil Conflict (20%)	81.3	15.8	100.0	18.6	0.54	0.53	0.66
	Terrorism (15%)	83.8	0.0	100.0	25.3	0.25	0.32	0.43
	Politically Related Terror and Violence (30%)	63.8	0.0	100.0	28.3	0.56	0.58	0.71
	Violent Crime (25%)	51.9	13.6	84.4	15.4	0.65	0.53	0.74
	Property Crime (10%)	67.0	30.9	93.0	13.7	0.62	0.54	0.65
Personal Freedom	Agency (25%)	55.7	12.2	95.1	19.6	0.74	0.72	0.89
	Freedom of Assembly and Association (20%)	57.3	1.2	97.7	27.1	0.47	0.47	0.63
	Freedom of Speech and Access to Information (20%)	58.7	1.8	98.2	24.2	0.41	0.45	0.58
	Absence of Legal Discrimination (20%)	48.6	7.0	92.1	19.3	0.63	0.62	0.78
	Social Tolerance (15%)	43.8	3.7	93.9	20.8	0.45	0.55	0.54
Governance	Executive Constraints (15%)	54.4	16.0	95.1	16.4	0.76	0.65	0.85
	Political Accountability (15%)	62.7	16.4	98.3	23.4	0.57	0.52	0.73
	Rule of Law (15%)	52.0	16.7	89.8	15.7	0.80	0.65	0.86
	Government Integrity (20%)	47.6	17.8	88.9	17.2	0.87	0.75	0.95
	Government Effectiveness (20%)	51.0	4.6	95.7	22.6	0.83	0.72	0.93
	Regulatory Quality (15%)	47.5	14.7	81.4	14.0	0.81	0.70	0.91
Social Capital	Personal and Family Relationships (20%)	68.1	9.1	91.3	16.1	0.71	0.74	0.70
	Social Networks (20%)	64.2	5.9	81.8	13.0	0.45	0.55	0.50
	Interpersonal Trust (20%)	38.7	18.3	80.4	13.0	0.28	0.27	0.31
	Institutional Trust (20%)	50.8	16.1	92.0	15.4	0.26	0.25	0.36
	Civic and Social Participation (20%)	33.9	1.5	83.9	15.0	0.26	0.36	0.41

Table 6(b): Open Economies Element Summary Statistics

Pillar	Element (Weight)	Mean	Minimum Value	Maximum Value	Standard Deviation	Pearson correlation with		
						Productive Capacity	Cantril's Ladder	Prosperity Index score
Investment Environment	Property Rights (30%)	57.5	20.2	90.4	16.6	0.88	0.75	0.94
	Investor Protection (20%)	51.5	8.7	86.5	17.9	0.76	0.67	0.85
	Contract Enforcement (20%)	49.6	13.1	87.4	14.6	0.70	0.57	0.77
	Financing Ecosystem (20%)	57.0	17.8	89.5	17.2	0.83	0.75	0.88
	Restrictions on International Investment (10%)	56.3	11.1	93.6	21.1	0.66	0.57	0.72
Enterprise Conditions	Domestic Market Contestability (35%)	54.2	11.1	100.0	23.2	0.85	0.71	0.93
	Environment for Business Creation (30%)	62.3	20.5	92.6	14.1	0.75	0.63	0.85
	Burden of Regulation (25%)	53.8	22.2	87.8	12.2	0.60	0.45	0.69
	Labour Market Flexibility (10%)	57.8	24.8	95.7	13.2	0.40	0.33	0.44
Market Access and Infrastructure	Communications (25%)	56.0	7.2	96.4	24.6	0.90	0.75	0.89
	Resources (20%)	50.7	10.1	91.0	21.2	0.92	0.78	0.90
	Transport (25%)	38.7	13.8	77.1	15.6	0.88	0.70	0.88
	Border Administration (5%)	50.9	15.5	94.6	18.8	0.78	0.64	0.87
	Open Market Scale (5%)	38.7	1.6	94.4	26.6	0.53	0.54	0.61
	Import Tariff Barriers (5%)	63.8	3.9	100.0	20.1	0.71	0.59	0.79
	Market Distortions (15%)	54.7	21.2	91.7	14.5	0.76	0.65	0.85
Economic Quality	Fiscal Sustainability (25%)	51.6	6.6	84.7	14.8	0.51	0.46	0.54
	Macroeconomic Stability (10%)	54.6	0.0	96.2	15.6	0.34	0.38	0.48
	Productivity and Competitiveness (30%)	48.6	10.9	94.7	21.0	0.87	0.71	0.88
	Dynamism (15%)	36.3	5.5	88.7	19.0	0.80	0.65	0.79
	Labour Force Engagement (20%)	55.2	18.9	94.4	14.2	0.67	0.64	0.72

Table 6(c): Empowered People Element Summary Statistics

Pillar	Element (Weight)	Mean	Minimum Value	Maximum Value	Standard Deviation	Pearson correlation with		
						Productive Capacity	Cantril's Ladder	Prosperity Index score
Living Conditions	Material Resources (20%)	65.7	11.3	98.0	24.4	0.87	0.77	0.84
	Nutrition (20%)	72.8	28.5	98.7	18.8	0.87	0.80	0.88
	Basic Services (10%)	78.8	13.9	100.0	24.1	0.82	0.71	0.78
	Shelter (20%)	70.4	10.6	99.3	25.7	0.87	0.74	0.81
	Connectedness (15%)	65.0	19.7	97.4	19.0	0.87	0.75	0.90
	Protection from Harm (15%)	68.5	25.5	96.9	15.2	0.77	0.69	0.79
Health	Behavioural Risk Factors (10%)	62.7	24.6	88.5	14.7	-0.57	-0.46	-0.53
	Preventative Interventions (15%)	77.3	8.1	96.3	16.6	0.61	0.59	0.71
	Care Systems (15%)	54.0	18.3	88.1	17.6	0.87	0.72	0.90
	Mental Health (10%)	66.6	25.4	87.9	10.6	0.24	0.32	0.31
	Physical Health (20%)	64.7	14.7	88.2	14.6	0.73	0.70	0.74
	Longevity (30%)	75.7	26.2	97.9	17.3	0.82	0.71	0.83
Education	Pre-Primary Education (5%)	52.6	0.9	99.6	31.0	0.78	0.73	0.83
	Primary Education (20%)	75.0	13.2	95.1	18.5	0.74	0.67	0.79
	Secondary Education (30%)	57.2	12.9	97.3	22.5	0.85	0.70	0.89
	Tertiary Education (20%)	40.0	2.8	86.8	19.4	0.86	0.75	0.89
	Adult Skills (25%)	63.6	12.1	94.3	21.9	0.82	0.69	0.84
Natural Environment	Emissions (15%)	68.8	41.7	86.0	8.6	0.03	0.01	0.06
	Exposure to Air Pollution (15%)	79.0	34.1	99.1	12.9	0.27	0.34	0.33
	Forest, Land and Soil (20%)	42.3	20.3	79.7	12.0	0.39	0.38	0.39
	Freshwater (20%)	52.0	8.0	91.1	17.2	0.60	0.63	0.72
	Oceans (15%)	39.4	0.0	79.3	25.3	0.26	0.25	0.17
	Preservation Efforts (15%)	44.4	11.4	90.1	15.0	0.48	0.45	0.60

Table 7: Pillar Cronbach's Alphas

Pillar	Cronbach's Alpha
Safety and Security	0.76
Personal Freedom	0.93
Governance	0.95
Social Capital	0.66
Investment Environment	0.92
Enterprise Conditions	0.78
Market Access and Infrastructure	0.88
Economic Quality	0.78
Living Conditions	0.95
Health	0.76
Education	0.92
Natural Environment	0.62

Appendix V: Country groupings for imputation

For the purposes of imputation, we organise countries into different groupings based on shared characteristics. These groupings are shown in the following table.

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9
Azerbaijan	Botswana	Argentina	Australia	Algeria	Afghanistan	Angola	Bangladesh	Albania
Belarus	Ghana	Belize	Austria	Bahrain	Eritrea	Benin	Cabo Verde	Armenia
Burundi	Jamaica	Bolivia	Belgium	Egypt	India	Burkina Faso	Cambodia	Bosnia and Herzegovina
Cameroon	Kenya	Brazil	Canada	Iran	Iraq	Central African Republic	China	Bulgaria
Congo	Lesotho	Colombia	Switzerland	Jordan	Nigeria	Chad	Djibouti	Croatia
Democratic Republic of Congo	Malawi	Costa Rica	Chile	Kuwait	Pakistan	Comoros	Ethiopia	Cyprus
Equatorial Guinea	Malaysia	Cuba	Germany	Morocco	Somalia	Côte d'Ivoire	Indonesia	Czechia
Eswatini	Mauritius	Dominican Republic	Denmark	Oman	South Sudan	Guinea	Laos	Estonia
Gabon	Namibia	Ecuador	Spain	Qatar	Sudan	Guinea-Bissau	Myanmar	Georgia
Kazakhstan	São Tomé and Príncipe	El Salvador	Finland	Saudi Arabia	Syria	Liberia	Nepal	Greece
Russia	Seychelles	Guatemala	France	United Arab Emirates	The Gambia	Madagascar	Rwanda	Hungary
Tajikistan	South Africa	Guyana	United Kingdom		Turkey	Mali	Sri Lanka	Italy
Turkmenistan	Tanzania	Haiti	Hong Kong		Yemen	Mauritania	Thailand	Latvia
Uganda	Zambia	Honduras	Ireland			Mozambique	Vietnam	Lebanon
Uzbekistan		Kyrgyzstan	Iceland			Niger		Lithuania
Zimbabwe		Libya	Israel			Papua New Guinea		Moldova
		Mexico	Japan			Senegal		Montenegro
		Mongolia	Luxembourg			Sierra Leone		North Macedonia
		Nicaragua	Malta			Togo		Poland
		Panama	Netherlands					Portugal
		Paraguay	Norway					Romania
		Peru	New Zealand					Serbia
		Philippines	Singapore					Slovakia
		Suriname	Sweden					Slovenia
		Trinidad and Tobago	United States					South Korea
		Uruguay	Taiwan					Tunisia
		Venezuela						Ukraine

Appendix VI: Degree of imputation by country

The 2019 Prosperity Index covers 167 countries, out of 169 countries that were considered for inclusion in the Index. Data availability is a significant constraint when building a composite Index, and Part II of this report outlines the methodology employed to circumvent missing data. We decided to exclude any countries from the Index that had over 50% of their values imputed, which led to the exclusion of the Democratic People's Republic of Korea and Western Sahara. Other countries, such as Kosovo, were not considered for inclusion in the 2019 Prosperity Index, due primarily to their small size (in terms of population).

Table 8, below, shows the breakdown of imputation by pillar for countries with over 15% of their indicators being imputed.

Table 8: Imputation by country and pillar – percentage of values imputed

Country	Overall Prosperity	Safety and Security	Personal Freedom	Governance	Social Capital	Investment Environment	Enterprise Conditions	Market Access and Infrastructure	Economic Quality	Living Conditions	Health	Education	Natural Environment
São Tomé and Príncipe	50%	33%	59%	87%	100%	57%	68%	59%	32%	27%	21%	33%	29%
Equatorial Guinea	49%	24%	44%	83%	94%	57%	68%	53%	42%	50%	21%	44%	17%
Guinea-Bissau	44%	24%	44%	80%	94%	43%	58%	50%	37%	27%	21%	50%	17%
Eritrea	44%	24%	44%	67%	100%	50%	47%	59%	32%	47%	14%	33%	17%
Cuba	42%	14%	30%	67%	47%	93%	79%	66%	26%	43%	0%	17%	4%
Turkmenistan	41%	14%	37%	67%	35%	89%	79%	66%	26%	3%	7%	61%	8%
Seychelles	40%	24%	56%	67%	94%	18%	26%	38%	53%	43%	28%	6%	38%
Somalia	39%	14%	33%	63%	18%	54%	68%	59%	42%	17%	3%	78%	21%
Papua New Guinea	38%	24%	44%	57%	94%	36%	42%	38%	16%	40%	17%	39%	21%
South Sudan	36%	14%	30%	63%	18%	50%	42%	69%	32%	10%	10%	44%	38%
Comoros	36%	14%	33%	83%	18%	57%	68%	56%	32%	10%	3%	22%	17%
Djibouti	35%	14%	30%	87%	24%	54%	58%	53%	32%	7%	0%	39%	13%
Taiwan	32%	14%	30%	40%	0%	25%	21%	44%	68%	27%	31%	50%	29%
Cabo Verde	31%	14%	44%	63%	82%	14%	16%	28%	16%	37%	14%	17%	25%
Central African Republic	28%	14%	30%	60%	18%	36%	42%	53%	32%	3%	3%	28%	4%
Hong Kong	27%	33%	11%	27%	6%	11%	26%	13%	11%	53%	52%	11%	50%
Congo	26%	14%	30%	60%	12%	36%	42%	47%	21%	0%	3%	39%	4%
Sudan	26%	14%	30%	57%	18%	36%	42%	44%	26%	3%	3%	33%	4%
Iraq	25%	14%	30%	57%	6%	36%	42%	44%	16%	0%	10%	33%	4%
Libya	24%	5%	37%	40%	12%	14%	16%	31%	26%	27%	7%	61%	8%
Afghanistan	22%	10%	0%	27%	12%	39%	42%	44%	26%	10%	10%	39%	8%
Iceland	20%	10%	30%	63%	6%	18%	26%	13%	5%	27%	14%	17%	0%
Eswatini	19%	5%	30%	60%	12%	14%	16%	44%	11%	10%	0%	0%	8%
Syria	19%	14%	30%	40%	18%	7%	5%	41%	21%	10%	7%	22%	8%
Uzbekistan	19%	10%	0%	30%	12%	39%	42%	44%	16%	0%	0%	33%	4%
Oman	19%	14%	41%	40%	59%	11%	11%	0%	0%	30%	10%	6%	8%

Table 8 (continued): Imputation by country and pillar - percentage of values imputed

Country	Overall Prosperity	Safety and Security	Personal Freedom	Governance	Social Capital	Investment Environment	Enterprise Conditions	Market Access and Infra-structure	Economic Quality	Living Conditions	Health	Education	Natural Environment
Luxembourg	**18%**	5%	30%	60%	0%	21%	26%	13%	5%	20%	7%	6%	4%
Switzerland	**18%**	5%	30%	60%	0%	18%	26%	13%	0%	20%	10%	17%	0%
Malta	**17%**	10%	33%	63%	6%	18%	26%	3%	5%	20%	7%	0%	0%
Gabon	**17%**	5%	30%	60%	6%	14%	16%	16%	5%	0%	3%	50%	0%
Haiti	**17%**	5%	30%	40%	0%	11%	11%	25%	21%	0%	3%	50%	8%
The Gambia	**17%**	5%	30%	60%	12%	14%	16%	13%	21%	10%	0%	11%	4%
Israel	**17%**	5%	30%	60%	0%	14%	16%	13%	0%	17%	14%	11%	4%
Cyprus	**17%**	5%	30%	60%	0%	18%	26%	6%	0%	23%	3%	11%	0%
Niger	**16%**	10%	0%	20%	6%	29%	42%	44%	21%	0%	3%	22%	0%
Belize	**16%**	5%	22%	30%	12%	7%	16%	38%	11%	3%	3%	33%	13%
Belarus	**16%**	10%	0%	23%	6%	29%	42%	41%	5%	3%	0%	33%	0%
Bahrain	**16%**	5%	33%	40%	18%	14%	11%	6%	5%	27%	3%	6%	8%
Togo	**16%**	10%	0%	23%	6%	29%	42%	38%	11%	0%	0%	22%	8%
Kuwait	**15%**	5%	33%	40%	6%	11%	11%	9%	5%	27%	3%	6%	13%

Appendix VII: A zero-migration model of working age population change

Demographics in productive capacity: Creating a zero-migration model of working age population change

To better understand the dynamics of how the working-age population affects productive capacity, we assessed not only the current trends in the proportion of the working-age population, but also projections for 2030. Having completed our analysis of future trends, we found some stark projections for the change in working-age demographics across the world, posing upcoming challenges in job creation.

Outline of methodology for a zero-migration model of working age population change

In assessing the way in which working age population percentages could change between 2015 and 2030, we created a zero-migration model. Disregarding migration makes the model simpler and provides a benchmark for future projections.

We calculate the absolute change in working age population by subtracting the total number of those who leave the working age population bracket from the number that enter the bracket from 2015-2030.

For this calculation, we consider the total additional number to enter the working age bracket by 2030 to be the population under 15 ($pop_{0\text{-}14}$) in 2015. We consider the total number to exit the working age bracket by 2030 to be the population between 50 and 65 ($pop_{50\text{-}64}$) in 2015, as well as those of working age in 2015 who die before 2030 ($mor_{15\text{-}65}$).[124] To calculate the number of working age adults who die before 2030 we take the current mortality rate of 15-65 year-olds, holding this constant throughout the 2015-2030 period, and compound this rate, to account for those working-age adults who die each year before 2030.

To calculate a rate of change of the working-age population from 2015-2030, we express this absolute figure as a percentage of the working age population in 2015. The calculation we use is as follows:

$$\frac{pop_{0-14} - pop_{50-64} - mor_{15-65}}{pop_{15-65}}$$

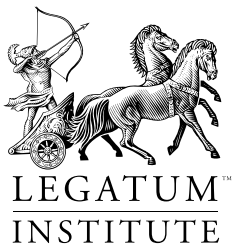
The result is the change in proportion of the working age population.

Results of zero-migration model of working age population change

Using this methodology, we see that by 2030, the working-age population of some countries would have increased by as much three-quarters since 2015, with most of the largest increases in sub-Saharan Africa; Mali, Chad, Uganda, and Niger are each set to face working-age population increases of over 70%, i.e., 3.6% per annum growth. This makes them set for a proportion of the working-age population to be higher than many European countries. Whilst accommodating one year at such a growth rate is not much of a challenge, it becomes a somewhat harder task when this is faced year-on-year, though it is still manageable. To ensure this demographic productive capacity is fulfilled, education, skills and jobs will need to keep apace. It is estimated 11 million new jobs will have to be created every year through to 2030 in sub-Saharan Africa alone to keep up with the number of new entrants to the workforce.[125]

124. Population data are from the United Nations' Population Division. Mortality data are from the World Bank's Development Indicators. It is worth noting this is not the same as the 15-60 mortality indicator used in the Prosperity Index, which is the probability of a 15 year old dying before reaching age 60 per 1,000 15 year olds, but the number of people of working age (15-60) in 2015 who are estimated to have died by 2030, based on the current death rate for that cohort.

125. Axel van Trotsenburg. "More and better jobs for developing nations," *World Bank*, May 11, 2018. Available at https://www.worldbank.org/en/news/opinion/2018/05/11/more-and-better-jobs-for-developing-nations.



CREATING THE PATHWAYS FROM POVERTY TO PROSPERITY

PROSPERITY INDEX

The Legatum Institute is an international think tank and educational charity whose mission is to promote policies that create the pathways from poverty to prosperity

Legatum Institute
11 Charles Street
London W1J 5DW
United Kingdom
T: +44 (0) 20 7148 5400

www.li.com
www.prosperity.com

@ProsperityIndex
@LegatumInst
#ProsperityIndex

NOVEMBER 2019