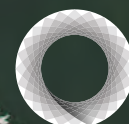UNIVERSITY OF CAMBRIDGE

Measuring wealth, delivering prosperity

The Wealth Economy Project on Natural and Social Capital,
Interim Report for LetterOne

LETTER ONE

Bennett Institute
for Public Policy
Cambridge

CONTENTS

"It is impossible to look at the growing evidence of climate change or loss of biodiversity without worrying that human society is living on borrowed time"

1. PREFACE TO THE INTERIM WEALTH ECONOMY REPORT
Diane Coyle

One of the striking features of politics in many countries now is the way voting outcomes and opinion polls reflect a widespread sense of discontent. Part of that alienation is economic: the fact that growth in Gross Domestic Product (GDP) reflects improving living standards for some, but not for many. Yet politicians still use 'GDP' as a mantra to justify their preferred policies, and the quarterly growth figures still feature prominently in the news.

GDP has focused the post-war western economies (and others) on growth in the consumption of goods and services from the current use of resources. The future has zero statistical weight. GDP figures have also ignored individuals, and geography, meaning many people and places have been invisible in policy debates. The innovations in the structure of the economy, involving intangible assets, data, and revolutionary changes in production, have been invisible too. What the state does not see, whatever is outside this narrow statistical lens, does not have any weight in policy making.

We are proposing a different approach to measuring the economy, in two stages.

The first involves some amendments to GDP: accounting properly for intangibles; removing unproductive financial investment; and adjusting for income distribution. These alone would make GDP a better measure of economic welfare.

The second stage is an alternative measurement framework based on the 'wealth economy' – on access to the range of economic assets people need to fulfil their economic potential and lead a meaningful life as they conceive it. This ambitious framework requires measurement of access to six types of economic assets that add up to what is known as comprehensive wealth:

- Physical assets and produced capital, including access to infrastructure, and to new technologies
- Net financial capital
- Natural capital, the resources and services provided by nature
- Intangible assets such as intellectual property and data
- Human capital, the accumulated skills, and the physical and mental health, of individuals
- Social and institutional capital

Access by individuals or groups to these different assets determines their ability to earn, to spend, and to engage in any other activities needed to lead the kind of lives they want.

We chose to focus on the wealth economy as a guide to whether or not there is any increase in prosperity because it measures the long-term capacity of the economy to deliver sustained growth and improving living standards. Without measuring changes in assets there is little prospect of delivering sustainability in its broadest sense, in terms of the economy and society as well as the natural environment.

We have started with a focus on natural and social capital, as the first steps to developing a comprehensive framework.

It is impossible to look at many environmental indicators without worrying that the economy is on borrowed time. This is why we chose to focus on natural capital, the resources, systems and services nature provides for human economic activity, such as food, air purification, nutrient cycling, materials and minerals. Poorly managed natural capital is a liability in any economy.

Motivated by the sense of social fracture in so many places, we are also exploring social capital, or in other words, the accumulated trust within communities and institutions and ability of a community to be more than the sum of its individual actions.

Our early work on both fronts is described in this report.

Changing the lens on the economy in public debate from short-term aggregate growth in GDP to the long-term, sustainable wealth of different communities is an ambitious task. Our team is one of a number of groups of researchers and practitioners around the world considering new approaches to measurement and, consequently, to public policy and individual behaviour. It could be a daunting task were it not for the fact that there is such a widespread sense that the time is ripe for a significant change of perspective.

We are deeply grateful to LetterOne for its support in our endeavours, giving us the means and the confidence to make a start on this ambitious goal. At the Bennett Institute, our goal is to rethink public policy in an era of turbulence and growing inequality. The Wealth Economy research is a vital part of that rethinking.

Diane Coyle, Bennett Professor of Public Policy

"opinion polls reflect a widespread sense of alienation from business as usual"

"A focus on GDP without proper regard for inequality or environmental degradation has also degraded global ecosystems and undermined social cohesion"

2. WHY THE WEALTH ECONOMY?

It is increasingly clear that 21st century progress cannot be measured with 20th century statistics. Established systems of national accounting and their associated macroeconomic statistics provide only a partial (and potentially misleading) view of modern economies. Crucial omissions include issues of sustainable economic growth, access to resources, human wellbeing, rights, capabilities and inequality. In increasingly globalised economies – and against the backdrop of climate change and voter backlash – these blind spots could reduce the efficacy and relevance of official statistics. Put simply, the gap between national accounts and the real world is growing.

Excessive fixation on GDP makes for poor policy. GDP is a measure of income. Its growth has improved living standards all around the world. But a focus on GDP without proper regard for individuals' access to assets which determine their economic potential, and regard for inequality or environmental degradation has also degraded global ecosystems and undermined social cohesion, ultimately threatening these gains in the future. Whilst GDP is an important measure, its growth is not the only way to improve the quality of life.

Our quality of life depends on more than annual income. No individuals would gauge their prosperity on the basis of one month's earnings. We also care about savings, pensions and debts. We invest in education to enhance our earning potential and understanding of the world. We value our social relationships and care deeply about our future ability to access not just a broad range of goods and services, but also opportunities, justice and security. Successful business leaders think about balance sheets, debt and fixed and intangible assets and their ability to generate future profits. Yet at the whole economy level, the focus of the economic debate has been predominantly, if not exclusively, framed in terms of GDP. The consequence? Humanity is facing mounting and intractable challenges.

Our measurement of prosperity and economic success needs to include measures of diverse critical assets. Prosperity depends on physical and human capital. But it also depends on the knowledge we can access and our ability and freedom to live in a peaceful, trusting society, a safe and stable climate and healthy ecosystems.

The Wealth Economy project seeks to ultimately augment GDP with a small dashboard recording access to key assets. This allows us to ask what forms of capital need to be measured, managed and preserved for the wellbeing of future generations.

Measuring wealth forces us to recognise opportunities and constraints on substitution. From renewable energy to meat produced in a lab and hydroponic agriculture, new technologies have potential to reduce our direct impact and dependence on many natural resources. But at scale, the irreversible loss of natural capital, such as deforestation of the Amazon or mass extinction of fish or insects, cannot be 'undone' or substituted by machines and human capital. Any study of natural capital must identify the critical assets – in the UK and globally - that need to be stewarded for future generations.

The broader our definition of wealth, the harder it is to measure and value. Key challenges remain in both natural and social capital, especially around the valuation of biodiversity. Bees provide significant economic benefits to the agricultural sector, other insects are critical to pest control, and plants and microbes degrade pollution and waste. Without them some businesses, or parts of the agrarian economy, face ruin. But even without valuation, our work with ecologists, biologists, and conservationists shows that wealth accounts that report the extent and condition of ecosystems in biophysical terms can – and should – be developed. Inevitably, gaps will remain, but we must get started and we must not confuse uncertainty in valuation with imputting zero value when making decisions. This project aims to move the global discussion on natural and social capital forward.

Sustainable growth, where wealth is monitored and managed is the *only* growth story available - all the others will fail. Decarbonising our economy and getting more out of the resources we have, as well as coping with rapid technological change, will require a systemic transformation in the activities and behaviours that have shaped society since the Industrial Revolution. The question is not *if* we will change, but *how*? How will policymakers, businesses and individuals manage change and design a better future. Delivering sustainability requires an improved understanding of 'the economy' that emphasises the changing dynamics of wealth.

"Any study of sustainability must identify the critical assets that need to be stewarded for future generations"

"Natural capital—which provides the building blocks of all other forms of capital— is generally in decline. This poses grave risks for wellbeing"

Conceptually, natural capital is similar to other types of capital produced by humans. Manufacturing plants are physical capital assets that produce flows of goods (e.g. cars) over time. Overuse wears down heavy machinery (depreciation). If the rate of depreciation is greater than the rate of reinvestment (capital maintenance expenditure), future output falls.

Similarly, stocks of natural capital assets generate flows of environmental goods and services over time. Forests and fisheries are like 'natural factories' producing flows of timber and fish. These natural capital assets are depleted and degraded by excessive pollution and overharvesting (depreciation). Future output will fall if this depreciation exceeds the combined rate of natural regeneration and human investment in natural capital maintenance (e.g. planting new forests, environmental restoration, conservation investments).

Unlike human, physical and knowledge capital, natural capital— which provides the building blocks of all other forms of capital—is generally in decline. This poses grave risks for wellbeing. GDP growth derived from depleting natural capital, which includes water, air, soil, minerals, and renewable capital such as forests or marine ecosystems which are prone to system collapse, deprives future generations of wellbeing. This is why natural capital is so important to measure.

"Unlike human, physical and knowledge capital, natural capital—which provides the building blocks of all other forms of capital—is generally in decline"

"Civic engagement and effective institutions go hand-in-hand with economic wellbeing and economic growth"

4. WHAT IS SOCIAL CAPITAL?

Social capital is often referred to as the glue that holds societies together. It encompasses personal relationships, civic engagements and social networks. Without it, there can be little or no economic growth or human wellbeing. This notion has strong intuitive appeal, but social capital has proven slippery to nail down, not least because it consists of many interrelated elements.

Social capital relates to generalised trust, shared rules, and the social norms and values that shape the ways we behave in everyday relationships and transactions. Social capital reduces transactions and monitoring costs and enables social and economic cooperation and exchange. The World Bank estimates that intangible capital (consisting primarily of human, social and institutional capital) may make up between 60% and 80% of total wealth in most developed countries. Ignoring this immense source of wellbeing – and its potential fragility – is to act blindly.

Data has long shown that trust, civic engagement and effective institutions go hand-in-hand with economic wellbeing and economic growth. One important study found that a moderate increase in country-level trust significantly increases economic growth. Another showed how regional differences in social capital (levels of cooperation, participation, social interaction and trust) dating back several hundred years determined Italian cities' and regions' ability to function effectively.

Studies find that the quality of governance and institutions explains a significant part of the variation in rates of growth and investment across countries by supporting social capital. When Daron Acemoglu and James Robinson asked why nations fail in their book of the same name, they concluded that the main determinant of economic prosperity was functioning, inclusive and law-based institutions.

Investment and innovation in institutions, behaviours and cultures can build social capital. Last year's Nobel Prize winner Paul Romer pointed out that innovation drives growth, but is not limited to technological capital and knowledge capital: it also applies to rules, governance, and policies. New technologies can even be harmful if not accompanied by rules that make growth sustainable – for example, rules that limit pollution, soil degradation, and overfishing – or rules that regulate employment and limit monopolistic rent-seeking.

Generalised trust in fellow citizens and institutions as well as the quality of governance are both the result and the cause of productivity growth and higher reported wellbeing. These positive feedback mechanisms mean sustained, carefully targeted policy interventions could trigger a virtuous cycle of good governance and higher productivity.

"New technologies can even be harmful if not accompanied by rules that make growth sustainable"

"Statistics are the lens through which we observe the economy: policymakers, businesses and individuals change their behaviour in response to the picture they see"

Measuring assets means assessing future value. One problem is that the valuation of assets, unlike that of goods and services currently being traded on markets, needs to be forward-looking and based on expectations. As a result, value can never be nailed down. This makes the valuation of wealth more volatile, but no less real. The morning after a stock market crash, the factories, land and labour which generate output have not disappeared, but the expectation of their ability to generate benefits in the future has diminished.

Yet the forward-looking element is precisely what makes wealth a better indicator of sustainability and the health of a nation than annual output or GDP. The future is 'priced in'. Moreover, because expectations can be influenced, credible leadership and innovation from business and government can change the real world, creating and converting wealth by steering new behaviours, technologies and markets to replace old.

Not only can new assets be stranded or created, but our understanding of the endogenous development of the economy can itself radically alter our ability to manage change (see box). Measurement can also shape the economy. Statistics are the lens through which we observe the economy: policymakers, businesses and individuals change their behaviour in response to the picture they see through that lens.

"wealth [is] a better indicator of sustainability … The future is 'priced in' "

6. MEASURING AND MODELLING WEALTH AS IT CHANGES

"What the theory of endogenous technological progress supports is conditional optimism, not complacent optimism. Instead of suggesting that we can relax because policy choices don't matter, it suggests to the contrary that policy choices are even more important than traditional theory suggests." – Paul Romer, 2018

In 2018, William Nordhaus and Paul Romer jointly received the Nobel Prize in Economic Sciences: Nordhaus for his work on the damage caused by climate change and Romer for developing endogenous growth theory, which examined how economies can achieve a healthy rate of economic growth.

However, their work differs significantly. While Paul Romer's theory of endogenous growth can be harnessed to direct and design a net-zero-carbon future, William Nordhaus's climate-economy models, which are widely used by policy makers today, may discourage policy action to address climate change.

Models like the widely-used RICE and DICE presuppose the technologies, tastes, preferences and behaviours that will dominate in the decades and centuries ahead. This means they miss out the important non-marginal dynamics of innovation that could potentially bring about systemic structural change and network shifts in the world economy. None predicted the precipitous fall in the price of renewable technologies. Solar photovoltaic (PV) costs fell 44 per cent in the two years to the end of August 2017 and have fallen by 83 per cent since 2010, a period over which the price of wind turbines has dropped 35 per cent.

Initially, inertia associated with historic ways of doing things precludes rapid change. But as enough players shift their investments and new technologies are deployed, learning and experience across a range of sectors improve performance and lower the costs of clean technologies. The development of new behaviours, institutions and networks reduces unit costs further. Those late to recognise the transition stand exposed to stranded or devalued assets.
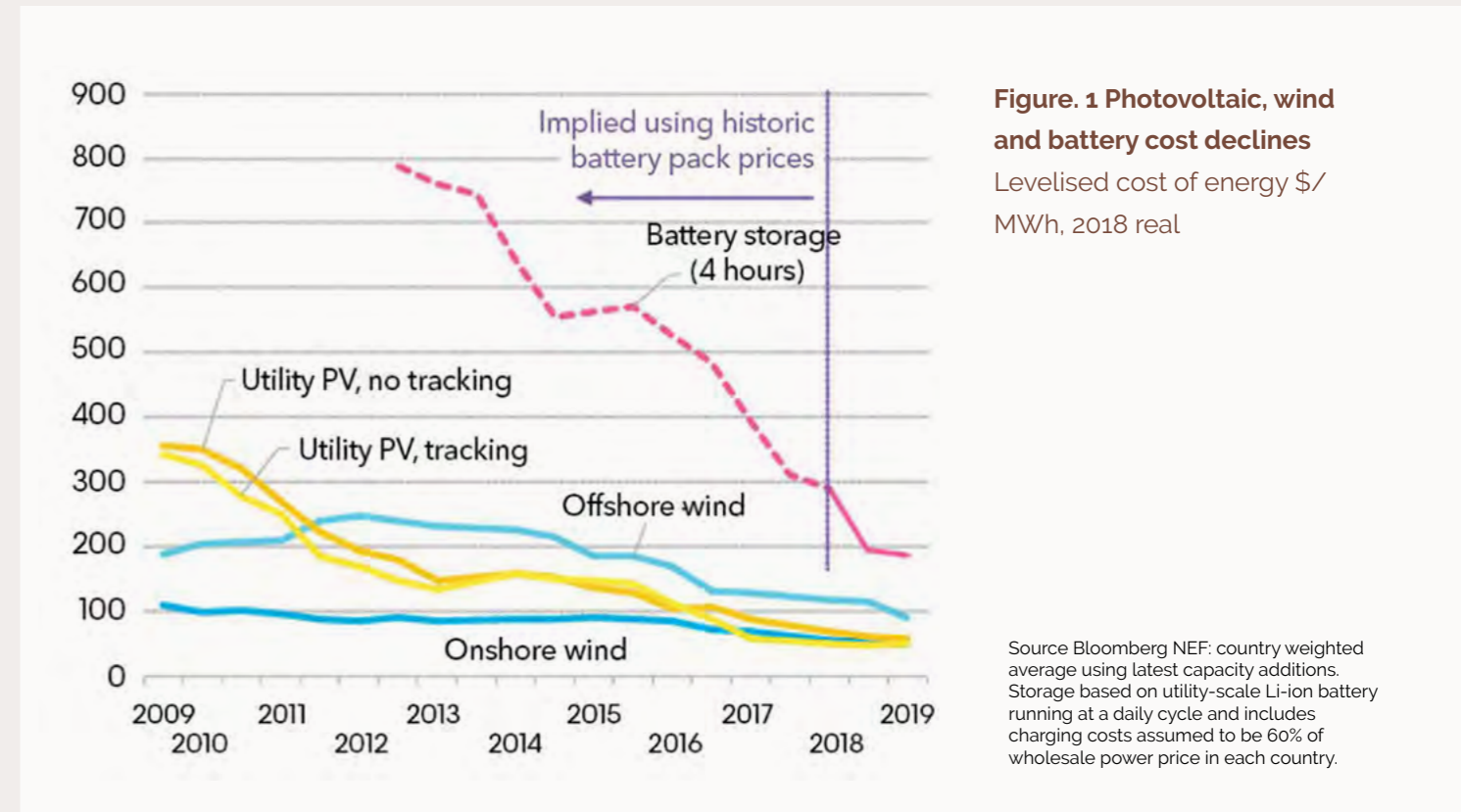

Figure. 1 Photovoltaic, wind and battery cost declines Levelised cost of energy $/MWh, 2018 real

Source Bloomberg NEF: country weighted average using latest capacity additions. Storage based on utility-scale Li-ion battery running at a daily cycle and includes charging costs assumed to be 60% of wholesale power price in each country.

The pace of change can be staggering (Figure 1). Fossil fuel-based infrastructure can rapidly shift from high value to being redundant and the wealth economy must be equipped to measure such changes.

Romer understood the importance of dynamics and feedbacks and concentrated on how expectations and actions determine outcomes. Both the speed and nature of growth (for example, whether it is clean and sustainable or dirty and based on resource depletion) will depend on the policy choices undertaken today and the infrastructure, technologies and institutions we lock in to.

The evidence suggests that when faced with systemic technological transformation, economists, policymakers and investors should spend less time using models to predict the future and more time using approaches like Romer's to direct and design it. The cost of preventing environmental degradation and addressing climate change is endogenous and our statistical tools need to be fit for capturing value in a rapidly changing and endogenous world.

Based on https://www.bennettinstitute.cam.ac.uk/blog/nobel-economics-2018-question-imbalance/

"Both the speed and nature of growth ... , will depend on the policy choices undertaken today and the infrastructure, technologies and institutions we lock in to"

"21st century progress cannot be measured with 20th century statistics"

7. OUR RESEARCH THEMES

GLOBALISATION AND NATURAL CAPITAL

International trade is a large and growing share of gross world product (figure 2). In the half century from 1961-2011, internationally traded goods and services grew from 24-61% of the global economy, and now account for up to one-third of total global carbon emissions. Official statistics for the 21st century must account for globalisation across three domains: economies, environmental challenges, and policy solutions.
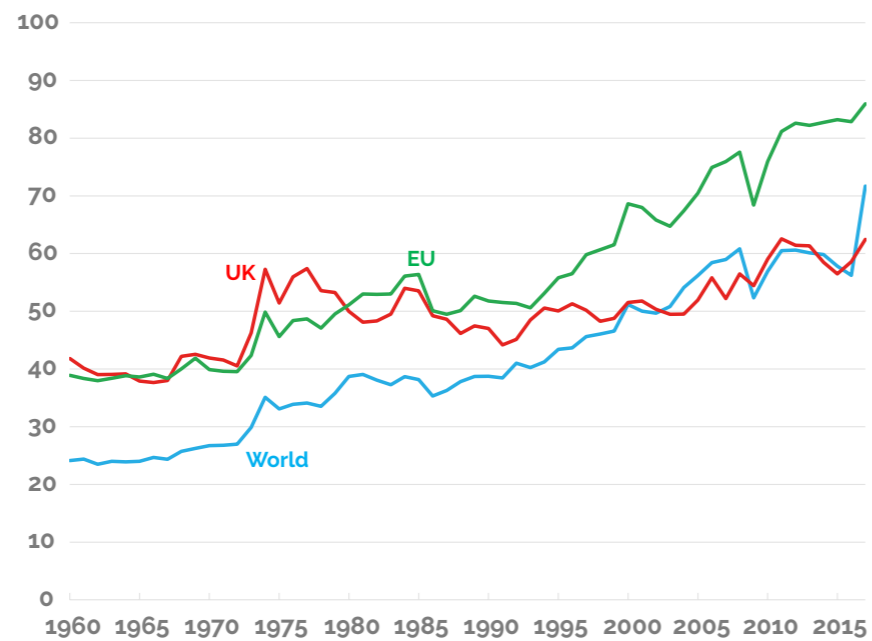

Figure. 2 International trade (% GDP)

Source: https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS

The Earth's ability to regulate the climate is a key component of natural capital. Greenhouse gas (GHG) emissions degrade this capital and are reflected in wealth accounts as depletions. But to which countries should we attribute the loss of natural wealth? The pace and extent of globalization in modern economies and environmental impacts forces us to reconsider our reliance on nationally-focused accounting. A more sophisticated treatment of international trade and global phenomena such as climate change is needed.

For example, we could imagine a global supply chain for carbon emissions, moving from the extraction of fossil fuels, to burning them in the production of goods and services, to consuming those goods and services. Each step could take place in a different corner of the world (figure 3). We could develop carbon accounts that attribute emissions to any point along that supply chain. Each perspective tells us something different about an individual country's relationship to global GHG flows. But current practice is to compile accounts only from the production-based perspective.
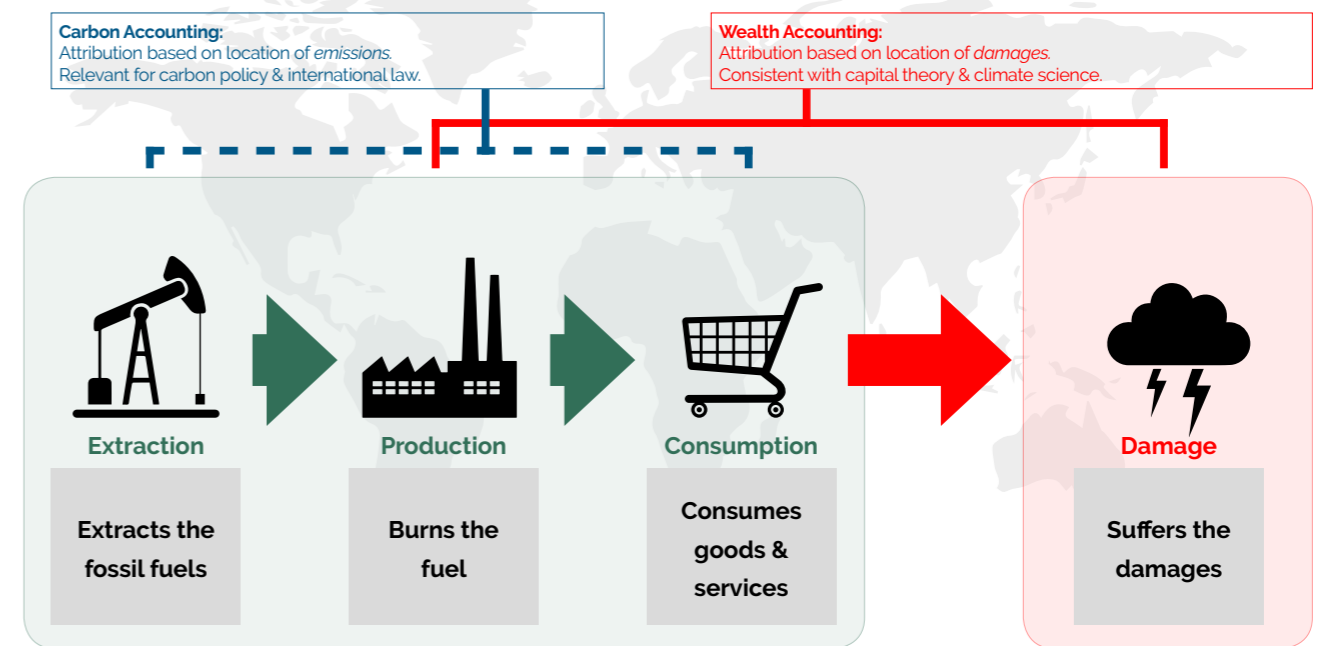

Figure. 3 Global supply chain for emissions

A production-based account can identify whether domestic emissions fall following implementation of a new policy, but would not identify whether the decrease in domestic emissions is being offset by rising imports of carbon-intensive goods (known as 'carbon leakage'). Extraction-based accounts similarly have blind spots, most notably in that they omit all non-fossil fuel greenhouse gases. Consumption-based accounts attribute notional liabilities for foreign production processes to domestic countries, potentially raising questions of national sovereignty. Crucially, each of these perspectives focuses on the location of *emissions* rather than the location of the *damage*.

7. OUR RESEARCH THEMES

Our working paper "Carbon accounts for Measuring Sustainability under Globalization" develops a suite of accounts that attributes emissions at each of the production, consumption, and damage stages of the supply chain. The effects of climate change – heat waves and deep freezes, floods and droughts, storms and desertification – are driven by atmospheric and oceanic processes, and may occur far away from production and consumption. Only the damage-based perspective adjusts the wealth accounts of nations for the climate damages they actually suffer.

The preliminary results show that observed progress towards national and global sustainability is sensitive to the accounting perspective used, suggesting that sustainability accounting requires a 'dashboard' approach combining multiple carbon accounts. The new damage-based approach has significant implications for the design of international climate agreements, the potential for climate compensation, and multiple United Nations Sustainable Development Goals.

TOOLS FOR MEASURING SOCIAL CAPITAL
Social capital is tricky to quantify because there is no obvious unit of measurement or observable variable for assessing its level, its change over time, or for making comparisons. But we can identify many of the things on which social capital depends and which are vital to economic prosperity: the level of trust people have in others and in institutions, the ability of communities to overcome collective action problems, and the size and quality of social networks.

This is a common challenge in economics and social science. Many of the concepts we'd like to study have no obvious measure or even agreed definition. These are known as 'latent variables'. For example, there is no single unit to measure a person's 'size'. But because we know that size relates to a combination of multiple observable variables (e.g. height, weight, waist size), statistical techniques can distil the information they contain into a small number of new variables that adequately explain the latent concept, size. These new variables are called principal components.

Our research applies the same logic to understanding social capital. We perform statistical analyses on UK and EU social surveys to construct a small number of principal components that explain our latent concept, social capital. This approach has two main advantages: we can simplify complex multidimensional data into just a few principal components, and we can perform formal statistical analyses on the otherwise unobservable concept of social capital.

This is important because social capital is a key part of the wealth economy. We'd like to know not just the level and trend in social capital, but also what helps create it and what policies might enhance it. Our research uses latent variable models not only to identify and measure social capital, but to perform formal tests regarding its spatial, cultural, and socio-economic variation.

SOCIAL CAPITAL IN THE EUROPEAN UNION
Many social surveys include a range of trust indicators, from trust in institutions (such as the police) to interpersonal relationships. A widely surveyed question is "do you feel most people can be trusted or you can't be too careful?" with respondents choosing a score from 0 (you can't be too careful) to 10 (most people can be trusted).

Analysing ten survey questions about trust in the European Social Survey[1], our preliminary findings show a first principal component explaining 50% of the total variation in trust responses, and which can be interpreted as general trust. A second component captures an additional 15% of variance and contrasts trust in people against trust in institutions. In other words, just two principal components capture the majority of the information in the survey questions. This structure is broadly consistent across demographic and other individual characteristics (age, gender, income and even by opinion on Brexit), by country group (e.g. Mediterranean, Scandinavian) and across time.

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1.   This research refers to the 8th wave of the European Social Survey, containing 44,000 observations from 23 countries collected 2016-2017. Data available at https://www.europeansocialsurvey.org/data/download.html?r=8

7. OUR RESEARCH THEMES

Once we predict the two underlying components for each individual in the survey, we can see how they vary across individual characteristics and location. Figures 5-8 show how these components differ across groups. The 'zero-line' is best interpreted as the European average, and the bars represent each sub-group's deviation from that average (Figure 4). Both components are highest for people in Scandinavia and lowest for those in Mediterranean and Eastern countries (Figure 5). The general trust component is highest among the very young and on average, decreases with age, while the second component is lowest among the very young and increases with age (Figure 6), pointing in the direction of young people being sizeably more trusting than their older counterparts in general, but also relatively more trusting of institutions rather than people.

The first component increases with income. The second does not vary much along this dimension (Figure 7), so that economic advantage seems to clearly correspond to higher general trust, but does not affect the relative trust placed in other people as opposed to institutions. Both components are higher, on average, for people with higher education levels (as one would expect from the income results). Finally, the first, general, component is higher among those who believe the United Kingdom should remain in the European Union as compared to those who think it should leave, while the second is higher for the second group (Figure 8). These correlations are expected too, as the Brexit vote can be thought of as both signalling a general erosion of trust and a decreased trust in
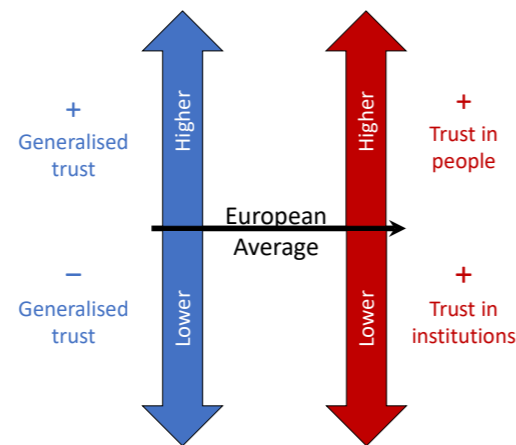
Figure. 4: The two principle components
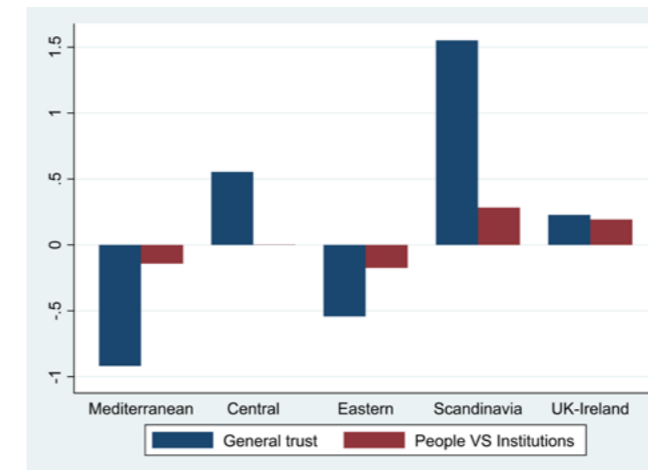
Trust within Europe[2]
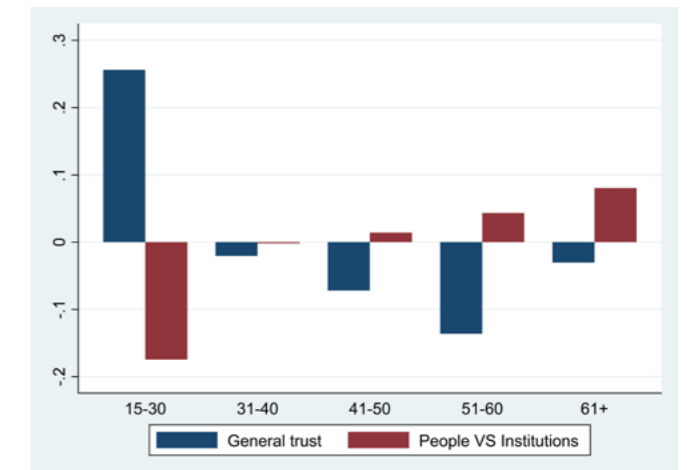Deviation from average

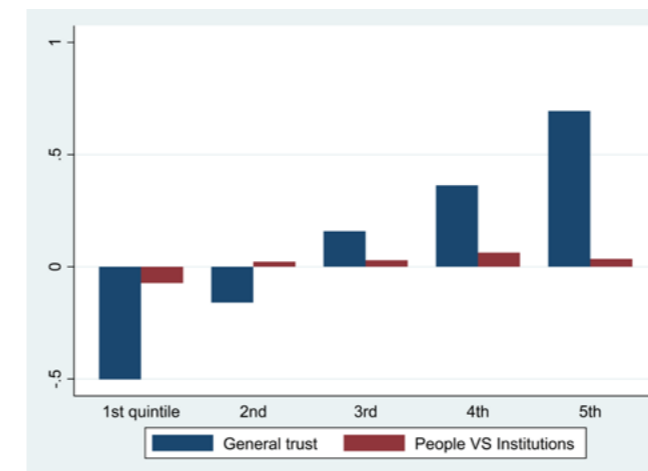**Figure 5: by region**

Figure 6: by age group

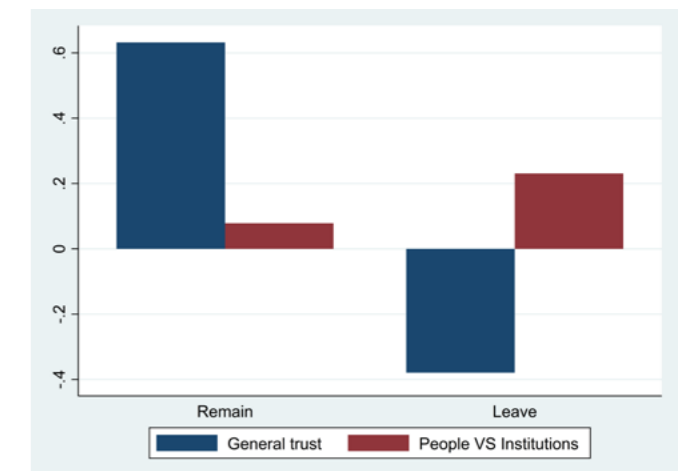**Figure 7: by income quintile**

Figure 8: by opinion on Brexit*

* expressed relative to the European average

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2. Countries covered include: Austria, Belgium, Czechia, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Russian Federation, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.

institutions, in favour of closeness to fellow individuals.
These preliminary results are encouraging for the prospect of
policymakers being able to measure the broad concept of social
capital in just two variables that crystallise the results of many
survey questions. Our next steps will involve using pseudo-
panel techniques to assess how the two components relate to
other proposed measures of social capital (such as membership
in organisations, involvement in the local community or voting
behaviour) as well as to estimate their effect on other variables of
interest, such as views on the environment.[3]

SOCIAL CAPITAL AND MACROECONOMIC PERFORMANCE

As a fundamental element of social capital, the formation of trust
relies on cumulative experiences of trustworthy interactions with
other people or broader social settings such as shared ethical
views, cultural norms and rules. Trust measures reflecting numerous
dimensions of social capital (e.g. culture and civic honesty) also
improve economic outcomes[4] by increasing efficiency and lowering
costs.

But how does social capital relate to macroeconomic performance?
Despite sustained efforts in the economics profession, formal
models of how social capital impacts macroeconomic dynamics
remain limited.[5] Dasgupta (2011) presents a theoretical model that
demonstrates how higher levels of trust among economic agents
will foster cooperation and productivity growth. To test this model,
we used responses from trust surveys in Europe to construct a
weighted indicator of trust for use in statistical analysis, using the
Penn World Database for total factor productivity (TFP). The data
seems to support Dasgupta's model: for every 10 percent increase in
the interpersonal trust indicator, TFP increases by 0.56 percent.

Figure plot: y-axis "Productivity Indicator" ranging from -0.2 to 0.25, x-axis "Trust Indicator" ranging from 1.25 to 1.95, with trend line equation:

$$y = 0.0566x - 0.0918$$
$$R^2 = 0.0762$$

Figure. 9: Relationship between productivity and trust[6]

But culture and social behaviours can differ across countries, and
attitudes may also be driven by events taking place in a given year.
Could this be driving the results? We used fixed-effects (a statistical
tool to help control for unique characteristics of individual countries
and years) to test this. Using data from the Penn World Database,
the model showed a statistically significant relationship between
trust indicators and productivity (Figure 9). However, no statistical
relationship was found with OECD data.

The conflicting results point to the need for a better understanding
of the ways social capital might affect macroeconomic outcomes.
This is a research challenge. Given that interpersonal trust is deeply
entangled with other measures of social capital, including other
measures of trust[7], it can be difficult to isolate empirically. Our
next step is to expand our data to include more countries outside
Europe and at different stages of economic development in order
to supply greater variation in the data, which will help test different
hypotheses.

3. These techniques exploit repeated-cross sections to build cohorts of individuals (in this case
    based on year of birth and country of residence) and follow them over time to account for
    unobserved cohort-specific heterogeneity, in a fashion similar to standard panel models.
4. Trust positively correlates with many key macroeconomic indicators, such as economic
    growth (Knack and Keefer, 1997) and income levels (Algan and Cahuc, 2010).
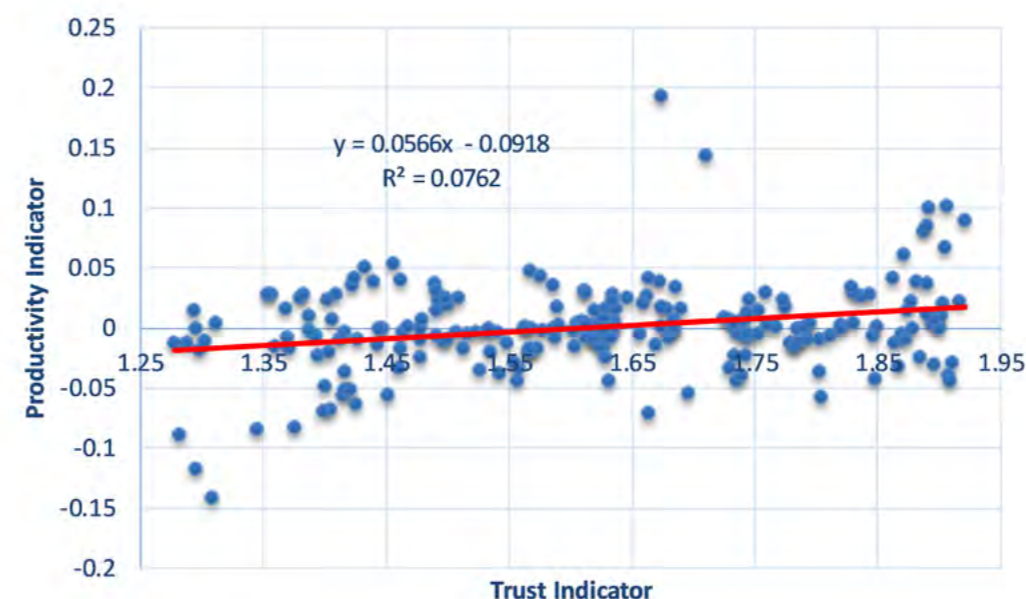5. Recent literature focus is more concentrated at the micro-level

6. Pooled OLS between productivity and trust. Both productivity and trust indicators are in
    logarithm
7. Trust in institutions, such as the government and corporations

8. GLOBAL MOMENTUM AND NEXT STEPS

2020 will be a big year in the world of wealth accounting and our project team is leading the way. We're contributing technical advice and primary research for many of the biggest environmental economic initiatives, from the United Kingdom to the United Nations.

In New Zealand, we're collaborating with the Treasury in its pioneering application of the wealth approach to statistical measurement and policy assessment. In the UK, Professor Sir Partha Dasgupta's team for HM Treasury's review of the economics of biodiversity has invited the Wealth Economy to provide a 'teach-in' session on wealth accounting, and our team has advised London's Mayor in developing the city's natural capital assessment. Our portfolio of research on natural capital and international trade will inform the **2020 review of the UN Sustainable Development Goals** and has been used to support the latest **UNEP Global Environment Outlook GEO 6**.

Looking toward the future, the Wealth Economy team is part of the **Technical Expert Forum working with the UN Statistics Commission** to revise their accounting standards for incorporating ecosystems into national statistics. These standards will be submitted to the United Nations General Assembly in 2021 to be adopted as an official statistical standard. In parallel, the World Bank now measures the 'true wealth' of nations, taking into account multiple forms of capital, including natural and social. The Wealth Economy project is building on this, and will continue to work with the World Bank to measure the Changing Wealth of Nations, particularly around carbon accounts and social capital.

We've also teamed-up with the UN Statistical Commission and the Australian Bureau of Statistics to develop a report on how finance ministries can incorporate wealth accounts into decision making. In partnership with GIZ and UNSD, this piece will provide an overview of the policy questions facing finance ministries and how wealth accounting could help address them. **We will also lead a global review of wealth accounting case studies,** using examples from over 50 countries to demonstrate how new statistics can enhance our understanding of modern economies and improve the quality of policy advice.

In the UK, our team has worked with the Committee on Climate Change, the Bank of England and the Office of Budget Responsibility to apply a wealth framing to the assessment macroeconomic and fiscal sustainability risks to the UK economy. Professor Diane Coyle continues to serve on the Natural Capital Committee advising the UK Government on natural capital management strategies. We are also engaging with the Office for National Statistics in its pioneering development of national level accounting for 'missing capitals'. We are collaborating with academics in leading universities around the world and maintain close links with the Oxford Wealth Project, the Centre for Social and Economic Research on the Global Environment, and Yale University.

With colleagues at Yale University and the UN Statistics Division we plan to hold a high-level workshop on **Communicating the Path to a Sustainable Future** for a group of public and private sector stakeholders and end users of wealth accounts. The team has also worked closely with the OECD and the UK Office for National Statistics to develop a standardised methodology for understanding and defining social and natural capital.

8. GLOBAL MOMENTUM AND NEXT STEPS

We recognise the importance of communication and dissemination in forming a common understanding of the importance of statistical measurements of wealth. There needs to be an international consensus to ensure wealth accounting becomes as firmly embedded in policy decisions as GDP has been to date. We continue to hold regular meetings with the global financial media while posting regular commentaries in key media outlets. Articles include 'How we measure the environment could change how the world works' 'Social and natural capital – why we should invest in it?', 'Towards a Framework for Time Use, Welfare and Household-centric Economic Measurement' and 'Understanding the Sharing Economy'.

BLOGS & NEWS

The team have been active in publicising and promoting their research on the Bennett Institute website:

Blogs

Nobel for Economics 2018 – a question of imbalance; Dimitri Zenghelis

The way forward in Natural and Social Capital; Julia Wdowin and Marco Felici

Mind over matter – how expectations generate wealth; Dimitri Zenghelis

Social Capital – the wealth all around us; Dimitri Zenghelis

Natural capital – The $100 trillion missing from the economy; Matthew Agarwala

Measurements for a better future; Diane Coyle

News

How we measure the environment could change how the world works [15 June 2019]

Zero-carbon future offers great possibilities (Dimitri Zenghelis) [10 June 2019]

Reaching net zero – the Bennett Institute's Dimitri Zenghelis advises CCC [3 May 2019].

Wealth Economy team contributes to revision of UN System of Environmental-Economic Accounting (Matthew Agarwala) [26 March 2019]

UK Office for National Statistics awards pilot research grant to Bennett Institute's Wealth Economy team (Matthew Agarwala) [18 March 2019]

UN report with Bennett Institute author calls for credible leadership to boost innovation and sustainability (Dimitri Zenghelis) [13 March 2019]

Beyond GDP – Cambridge research project explores new measures for the 21st century economy [8 Jan 2019]

The team's research has been presented at the Royal Society, the FT Literary Festival, the Rethinking Capitalism lectures at UCL, the Royal Economic Society Conference, Cambridge Econometrics, LetterOne 'Townhall' event, the International Symposium on Finance, the Energy Policy Research Group, the UK Office for National Statistics, the Life Sciences MSc programme at Imperial College, the Wealth Economy workshop in Cambridge and at the Oxford Sustainable Finance Advisory Group meeting.

Across all our activities, we aim to enhance our understanding of modern economies, improve the quality of policy advice, invigorate public debate and enable investors and innovators to profit from protecting the planet and design a safe, secure and sustainable future.

Improving the quality of statistics to include a broader suite of assets is a long-term endeavour. But even partial success in developing metrics while acknowledging what is missing, can better help inform policy and business decisions. Developing innovative metrics to account for and improve our use of natural capital provides a more holistic measure of changes in human wellbeing, and enhances our understanding of the sustainability of development.

This project aims to refine the measurement of natural and social capital and enhance statistical research globally by refining definitions to inform its economic measurement. In February, we invited the world's leading academics and practitioners to Cambridge to develop a strategy to advance a global wealth-based approach. By building links with stakeholders involved in dissemination of future research proposals and forming strategies to communicate and engage with policy makers, our research will help measure and understand the fundamental health of the global economy. Never before has such an assessment been more urgent, or more possible.

WEALTH ECONOMY TEAM

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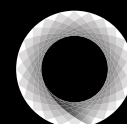**Lucy Theobald**
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