

## 0 Chapter 22 – The Contributions of Social Sciences to Policy and Institutional Change

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6 **Summary**

7 This chapter engages the contributions of the social sciences to policy and institutional change. The chapter is organized as follows. The first six sections of the chapter cover six policy domains: Economics (section 1); Education (2); Environmental Protection (3); Health and Safety (4); Development (5); and Science and Technology (6). A concluding section (7) offers an overarching historical perspective on the societal role of the social sciences, and then outlines some critical challenges that must be met if the social sciences are, in the future, to function as a force for progress.

8 It would be absurd to aim here at a comprehensive accounting of the social science/policy nexus. However, in selecting six distinct and important policy domains, to be reviewed by the chapter, we have

tried to achieve a coverage sufficiently wide that the emerging themes and lessons will not be seen as idiosyncratic to a particular area of policy choice.

- 9 Each of the six sections addresses the social science/policy nexus by addressing one or both of the following questions. First, how does social science help explain the process of policy development in the covered domain? (This first question takes policy and institutions as features of the social world that can be illuminated using the tools of social science.) Second, how has social science influenced policy development there?
- 10 With respect to this second question, two modes of influence might be delineated. One is *direct*. Social scientists transmit their research findings directly to policymakers, or indeed play an official role (as policymakers or civil servants) in governmental bodies or NGOs. A second, indirect mode of influence occurs in the elaboration of models and tools that help shape how policymakers think about their choices.
- 11 On balance, the reviews of the six policy areas vindicate the importance of social science to policy and institutional change, both in explaining these features of social systems, and in (directly or indirectly) influencing policy choices and institutional design.
- 12 What, now, are some key themes that emerge from the six sections? One concerns the role of markets. The “laissez faire” (or neo-liberal) view of good policy says that the fundamental goal of government should be to safeguard the conditions for a free market: strong property and contracts, robust competition in markets for goods and labor, all secured by an impartial judiciary. The laissez faire view is hotly contested, not merely between economics and other social sciences, but within economics itself. Many economists would endorse a “market failure” framework for policy design: policies should redress shortcomings in the free market. “Laissez faire” is, then, the position that market failures are infrequent. But are they? A debate about the scope and extent of market failures occurs in all the policy domains covered by this chapter.
- 13 A second theme is that a healthy social science may be characterized by substantial internal debate. This is true of the physical sciences, and it’s no less true of social sciences. There can be strong disagreement about which models best approximate social processes; about the appropriate methodologies for confirming, falsifying, or calibrating a given model; and about what current evidence suggests about the parameters of a given model. These familiar substantive and methodological debates within an academic

community of social scientists then give rise to parallel disputes about appropriate governmental policy and institutions—when the learning of that community is deployed to give policy advice.

- 14 A third theme is the inevitable tension that arises when no accepted social-scientific model accounts for some of the policy-relevant mechanisms in the context at hand. The social scientist then faces a tradeoff—either (a) rely on the models, and thereby give advice that ignores some of the real-world factors that are actually in play; or (b) take account of those factors, via a more holistic approach to policy advice that uses the models only as a jumping-off point, and then be vulnerable to complaints that the advice is ad hoc and lacks firm scientific foundations.
- 15 A final theme is the recurrent question of inequality. Although global income and wealth inequality has declined in recent decades with economic growth in China, India, Africa, and elsewhere, income and wealth inequality within developed countries has increased. Within-country inequality is both politically destabilizing (as in the Trump election or Brexit), and intrinsically ethically problematic, at least to the extent that it can be redressed without shifting costs onto those who are globally less well off. How, then, should policy advice take account of inequality? A traditional view within economics counsels the separation of “efficiency” and “equity.” Supposedly, equity concerns can be handled by the tax-and-transfer system; policy advice in other areas can ignore equity considerations. However, this view is hotly disputed by other approaches in economics (section 1), and indeed cannot be sustained when we turn to specific policy domains such as education (2), environmental protection (3), or health and safety (4). Social scientists must, therefore, grapple with giving policy advice that takes account of distributional concerns, rather than seeing inequality as a separable problem that can be hived off to a specialized set of policy instruments.
- 16 As already mentioned, section 7 discusses challenges going forward. Perhaps the key challenge is this. The influence of social science on policy formation often comes in a technocratic mode—by way of communications with government officials or civil servants, or the formation of their conceptual frameworks—and not in conversation with the electorate. Social scientists need to think carefully about how to enter democratic discourse—a discourse that is anything but calm, with electorates roiled by the real and perceived harms of globalization and of rapid technological change. Moreover, in working to craft better policies, social scientists should also pay closer attention to the design of democratic institutions themselves. Explaining the workings of democracy, providing advice about how to

craft participatory institutions, and taking part in public debate should be—even more than in the past—tasks that social scientists undertake.

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## 17 Introduction

- 18 This chapter engages the contributions of the social sciences to policy and institutional change. The chapter is organized as follows. The first six sections of the chapter cover six policy domains: Economics (section 1); Education (2); Environmental Protection (3); Health and Safety (4); Development (5); and Science and Technology (6). A concluding section (7), entitled “It could be otherwise... normativity in the social sciences,” steps away from specific policy domains. This concluding section offers an overarching historical perspective on the societal role of the social sciences, and then outlines some critical challenges that must be met if the social sciences are, in the future, to function as a force for progress.
- 19 The contribution of the physical sciences and technology to societal change are obvious, to experts and laypeople alike. We live in an age where technology permeates the daily lives of many (increasingly even the poor), and in which the pace of technological development is evident (for example, most internet and iPhone users now are old enough to remember a time without these remarkable tools).
- 20 The role of the social sciences is more subtle. This is true, certainly, at the level of popular awareness, and even for experts. Social scientists themselves will be steeped in the knowledge base and theoretical paradigms constitutive of their discipline, but may not be personally engaged in giving policy advice or otherwise deeply aware of the linkages from the discipline itself to government and society.
- 21 The aim of the chapter is, therefore, to review how the social sciences have shaped policy. The chapter is, of course, one part of a report—the report of the “International Panel on Social Progress”—whose very ambition is to marshal the learning of hundreds of contemporary social scientists (and academics from other disciplines too) as a force for good. The chapter reflects on the enterprise of IPSP, by discussing generally whether the social sciences have had the kind of influence that the IPSP hopes to have.

- 22 It would be absurd to aim here at a comprehensive accounting of the social science/policy nexus. However, in selecting six distinct and important policy domains to be reviewed by the chapter, we have tried to achieve a coverage sufficiently wide that the emerging themes and lessons will not be seen as idiosyncratic to a particular area of policy choice.
- 23 Each of the six sections addresses the social science/policy nexus by addressing one or both of the following questions. First, how does social science help *explain* the process of policy development in the covered domain? Second, how has social science *influenced* policy development there?
- 24 The first question takes policy and institutions as features of the social world that can be illuminated using the tools of social science. Section 6 (Science and Technology) provides an exemplary treatment of this first, explanatory, question. “Science and technology studies” (STS) is a discipline that seeks to understand how technological innovations occur and when and how they “stick.” To quote from that section:
- 25 “STS research underscores the observation that, contrary to the premise of the linear model, even the most path-breaking scientific ideas do not remake society in and of themselves. Innovation takes work, and that work in turn involves a multiplicity of actors, institutions, materialities, and norms. But how do these elements come together, why do some gain ground more easily than others, and how do the observed dynamics of making new sociotechnical arrangements intersect with classical social science theories about structure and agency?”
- 26 Three models of the social impact of technological innovations are surveyed: (a) “actor-network theory,” a bottom-up model that stresses the role of individual innovators and the networks of researchers in which these individuals are embedded; (b) top-down “structuralist” models that point to the needs of the state and of corporations; and (c) “interactive” explanations that highlight the ways in which both market and state structures, and the agency of individual innovators, interact with shared understanding regarding the normative purposes of innovation.
- 27 Mainly, however, the chapter focuses on the second question. How have the social sciences *influenced* policy and institutional change?
- 28 With respect to this second question, two modes of influence might be delineated. One is *direct*. Social scientists transmit their research findings directly to policymakers, or indeed play an official role (as policymakers or civil servants) in governmental bodies or NGOs. For

example, the direct influence of the discipline of economics on macroeconomic policy (section 1) is pervasive. Economists staff key positions at central banks, as well as within treasury offices and on the staff of Presidents and prime ministers. Legislative and bureaucratic choices regarding fiscal and monetary policy are directly shaped by the findings and contestation about these matters within academic economics.

29 Similarly, development policy (section 5) has been substantially shaped by the World Bank, which in turn both employs numerous economists, and more generally has been responsive to the advice of economists regarding the importance of a “level playing field” and “good governance” for development. Public health scholars have influenced policy choices about health care priority setting and allocation (section 4), both in direct conversation with national governments, and by virtue of their influence on these matters at the World Health Organization and the World Bank. The massive “Global Burden of Disease” study has had, and will undoubtedly continue to have, a major role in guiding priority-setting.

30 Note that this direct influence is not equally strong across policy domains. One of the findings of the review of education policy (section 2) is that,

31 “...there has not been extensive implementation of the body of evidence-based research, and the adoption of prevention and intervention programs is often driven more by ideology than by evidence. ... One big challenge for [education policy in] the 21st century will therefore be to take up the models and empirical findings provided by the field of implementation science, [that is] ‘the scientific study of methods to promote the systemic uptake of research findings and evidence-based practices into professional practice and public policy.’”

32 A second, more indirect mode of influence from the social sciences to policymaking can also be delineated. This is in the elaboration of models and tools that help to shape how policymakers think about their choices. To be sure, the line between the “direct” and “indirect” channels is fuzzy. But it does seem useful to differentiate between, on the one hand, social scientists giving advice on specific policy issues; and, on the other, the background—but potentially quite potent—function of social scientists in supplying the concepts that structure policy discussion. Here are a few illustrative examples of the more indirect mode of influence, described below. In the case of environmental policy (section 3), economists and political scientists have played a central role in developing both an understanding of the justification for governmental interventions (in particular externalities and commons problems), and a typology of

interventions to mitigate environmental harm (ex post liability, mean-based regulation, performance-based regulation, market instruments, and others).

- 33 In the case of health policy (section 4), the concept of life expectancy is central both in assessing societal condition (for example, determining the current life expectancy in a given society of individuals depending on age, gender, socioeconomic status etc.), and in evaluating governmental interventions to improve health. The life-expectancy concept and its refinements and cognate concepts (such as the “disability adjusted life year,” or DALY), as well as measurement techniques, derive from academic work. In economic policy (section 1), the legacy of Keynes (the views of Keynes himself and his successor Keynesians, and the challenges to Keynesianism by leading scholars such as Milton Friedman) is the intellectual matrix within which political debate about fiscal and monetary choices occurs.
- 34 On balance, the reviews of the six policy areas vindicate the importance of social science to policy and institutional change, both in explaining these features of social systems, and in (directly or indirectly) influencing policy choices and institutional design.
- 35 What, now, are some key themes that emerge from the six sections? One concerns the role of markets. The “laissez faire” (or neo-liberal) view of good policy says that the fundamental goal of government should be to safeguard the conditions for a free market: strong property and contracts, robust competition in markets for goods and labor, all secured by an impartial judiciary. The laissez faire view is hotly contested, not merely between economics and other social sciences, but within economics itself. Many economists would endorse a “market failure” framework for policy design: policies should redress shortcomings in the free market. “Laissez faire” is, then, the position that market failures are infrequent. But are they? For example, a free market for health insurance seems unworkable (Section 6). “Three factors – moral hazard, decisions under conditions of uncertainty, and asymmetrical information between the actors – are likely to cause market failure in the health insurance market. Voluntary health insurance will lead to adverse selection so that the young and healthy would get lower premiums and those with pre-existing conditions or the elderly at higher risk will be excluded or get higher premiums. In the absence of collective risk-pooling, premiums for low-risk patients will remain low, while premiums for those who really need health care will increase to the point where market failure and inefficiencies will occur. The state must therefore regulate this market and make risk pooling mandatory.” Analogous discussion of the scope and extent of market failures occurs in all the policy domains covered by this chapter.

- 36 A second theme is that a healthy social science may be characterized by substantial internal debate. This is true of the physical sciences (as we've known since at least Thomas Kuhn's work on the processes of scientific discovery), and it's no less true of social sciences. There can be strong disagreement about which models best approximate social processes; about the appropriate methodologies for confirming, falsifying, or calibrating a given model; and about what current evidence suggests about the parameters of a given model. These familiar substantive and methodological debates within an academic community of social scientists then give rise to parallel disputes about appropriate governmental policy and institutions—when the learning of that community is deployed to give policy advice.
- 37 A third theme is the inevitable tension that arises when no accepted social-scientific model accounts for some of the policy-relevant mechanisms in the context at hand. The social scientist then faces a tradeoff—either (a) rely on the models, and thereby give advice that ignores some of the real-world factors that are actually in play; or (b) take account of those factors, via a more holistic approach to policy advice that uses the models only as a jumping-off point, and then be vulnerable to complaints that the advice is ad hoc and lacks firm scientific foundations. For example, the section on development (section 5) describes a process “in which a dominant paradigm takes hold, in a way that goes beyond the evidence, and then pushes back against efforts to add complexity, to soften the edges of certainty, to open up room for exploration. The forces that drive this process seem general – so the likelihood is high that it is likely to repeat itself well beyond the two examples that are the focus here, and be evident across a wide variety of areas of development discourse.” (The dominant paradigms there described are the models that predict economic development to follow readily upon the introduction of free market and ‘good governance’ institutions, ignoring the messy realities of existing social norms, networks, and culture in developing countries.) Similarly, neo-classical economic models fail to account for irrational behavioral forces, such as the psychology of herding, that help to explain the financial crash of 2008 (section 1).
- 38 A final theme is the recurrent question of inequality. Although global income and wealth inequality has declined in recent decades with economic growth in China, India, Africa, and elsewhere, income and wealth inequality within developed countries has increased – as famously documented by the work of Thomas Piketty. Within-country inequality is both politically destabilizing (as in the Trump election or Brexit), and intrinsically ethically problematic, at least to the extent that it can be redressed without shifting costs onto those who are globally less well off. How, then, should policy advice take account of inequality? A traditional view within economics counsels

the separation of “efficiency” and “equity.” Supposedly, equity concerns can be handled by the tax-and-transfer system; policy advice in other areas can ignore equity considerations. However, this view is hotly disputed by other approaches in economics (section 1), and indeed cannot be sustained when we turn to specific policy domains such as education (2), environmental protection (3), or health and safety (4).

39 Individuals can be expected to benefit from a market in goods and labor (using net wealth as adjusted by government taxes and transfers), rather than being exploited by other market actors, only if they have sufficient skills and are sufficiently well informed. Issues of educational equity should, therefore, be seen as a key component of education policy, even for those whose basic policy commitments are *laissez faire* (let alone for others). Inequalities of health and life expectancy raise ethical concerns, not merely inequalities of income and wealth. But it is hard to see how the tax-and-transfer system, alone, is sufficient to redress these. (For example, taxes based on health status or risk exposure would be difficult to implement, in part because of asymmetric information.)

40 Social scientists must, therefore, grapple with giving policy advice that takes account of distributional concerns, rather than seeing inequality as a separable problem that can be hived off to a specialized set of policy instruments.

41 This Introduction has, thus far, reviewed the first six sections of this chapter: describing key questions and themes. As already mentioned, section 7 discusses challenges going forward. Some of the challenges been alluded to here, but section 7 offers a more synoptic treatment, and the reader is encouraged to engage this section closely. Perhaps the key challenge is this. The influence of social science on policy formation often comes in a technocratic mode—by way of communications with government officials or civil servants, or the formation of their conceptual frameworks—and not in conversation with the electorate. Social scientists need to think carefully about how to enter democratic discourse—a discourse that is anything but calm, with electorates roiled by the real and perceived harms of globalization and of rapid technological change. Moreover, in working to craft better policies, social scientists should also pay closer attention to the design of democratic institutions themselves. Explaining the workings of democracy, providing advice about how to craft participatory institutions, and taking part in public debate should be—even more than in the past—tasks that social scientists undertake.

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# 1. Economics and Economic Policy

## 1.1 Introduction: Two Axes

The emergence of economics as a self-standing discipline relatively independent of moral philosophy is commonly dated to the publication of Adam Smith's *Wealth of Nations* in 1776. In this founding tract, and in the subsequent quarter millennium of disciplinary discourse, economics has rarely been far from policy making. Economic frameworks have influenced economic policy making in the general and in the specific. In return, emerging policy dilemmas have shaped the discipline of the time and thus its analysis and prescriptions for future economic policy. It is this interplay between the discipline and the policy arena which this contribution attempts to explore. The exploration can perforce be very limited given the space constraint and vast terrain to be covered, over 250 years of experience. The approach taken here is to illustrate the interaction through a small number of key issues and players over this period.

There are two fundamental questions which run right through the two and a half centuries of economics and economic policy. First, what is the appropriate way to capture the workings of the economy, at the micro and at the macro level? Second, what is the appropriate way to evaluate economic outcomes? Among the issues raised by the first are how best to describe the economic behavior of individuals and groups of individuals, and how best to describe the workings of economic markets. Among the issues raised by the second are the tradeoff between total national income (or its growth) and its distribution among individuals and classes, and indeed whether economic policy making should take into account non-economic outcomes in its design and assessment. These issues and their close cousins structure the discourse in this chapter as we look at the interactions between analysis and policy through the writings of a selection of great economists grappling with the big questions of their time.

## 1.2 Adam Smith, The Corn Laws, and The Compensation Principle

To begin at the beginning:

“As every individual, therefore, endeavours....to direct that industry that its produce may be of the greatest value, every individual necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it....he intends only his own gain, and he is in this, as in many other cases, led by an

invisible hand to promote an end which was no part of his intention.” (Adam Smith, *The Wealth of Nations*, Book IV, Chapter II, paragraph IX).

- 49 This paragraph, much quoted, much admired, and much reviled, captures the essence of the core of a particular line of economic argument. Individuals, acting in markets with free competition and no economic power, will in an uncoordinated fashion promote “the public interest,” which from the context and its economic setting in effect means the general economic wellbeing, or the “size of the economic pie.” It took two centuries for economists to refine and make precise this proposition, setting out the conditions under which it holds, now referred to in standard textbooks as “The Fundamental Theorems of Welfare Economics.”
- 50 But these very theorems, because they set out the conditions under which the proposition holds, also highlight its limited direct applicability in the real world. Nobel prizes in the modern era have been awarded to economists such as Joseph Stiglitz (2002a) for advancing understanding of a world in which these conditions, of a free market, full information, and so on, are not met. But, despite this, the invisible hand metaphor continues to frame the instincts of economic policy makers, at least those who have been schooled in economics as a discipline.
- 51 The invisible hand proposition also holds in abeyance the distributional question—who gains or who loses from economic policy? Here policy makers have always been ahead of economists since they cannot afford to ignore distributional outcomes in the political arena. As a result, economists have struggled mightily to square the distributional circle. In the great Corn Laws debate of the 1830s and 1840s, those in favor of the repeal of tariffs on the import of corn certainly appealed to the invisible hand proposition. The Economist magazine was founded in 1843 to make the case for removing this interference in the market mechanism. But at its heart the issue was one of distribution. The Corn Laws benefited the landed classes, which the Anti-Corn Law League described as a “bread-taxing oligarchy, unprincipled, unfeeling, rapacious and plundering” (Briggs, 1959, p. 314).
- 52 But how can economics, if it is to be value free, address distributional questions? How can it weigh the gains of one individual or one group of individuals against the losses of another? The “Pareto principle” according to which economists can pronounce an improvement only if no one has been harmed and at least one person has benefited, is a recipe for policy impotence since most policy changes (for example the repeal of the Corn Laws), would surely entail winners and losers. In the 1930s a series of debates between

the giants of that time—Robbins (1932, 1938), Kaldor (1939), Harrod (1938) and others—tried to resolve this through the “compensation principle,” which states that a policy change can be pronounced an improvement if the winners *could* compensate the losers and still have some surplus left over. But no actual payment was required by this principle, which therefore embodied a value judgement that gave distribution no weight whatsoever. It took the post-war work of Atkinson (1971), Sen (1973) and others to establish that distributional value judgements will always be involved in economic policy making, and it is best to be explicit about these.

### 53 1.3 Keynes, Laissez Faire, and the Treasury View

54 With the repeal of the Corn Laws, economic policy in Britain and perhaps in Europe settled into a long period of laissez faire liberalism where the core of economic analysis was governed by a framework of markets in which no agent held economic power, and economic policy matched this analytical construct. The dominant text of the latter part of this period was Alfred Marshall's *Principles of Economics*, first published in 1890. The Royal Economic Society was also founded in 1890, the American Economic Association in 1885, and Marshall succeeded, against considerable opposition, in founding a separate degree in economics at the University of Cambridge in 1903. Before this date, however, the young John Maynard Keynes, admitted to Cambridge to study mathematics, had been introduced by Marshall to economics through his text *Principles of Economics*.

55 It is perhaps ironic, then, that it was Marshall's student Keynes who issued in 1926, two years after the death of Alfred Marshall, a clarion call against laissez faire liberalism, the dominant economic and economic policy anchor of its time. In his brilliant essay, *The End of Laissez Faire*, he excoriated the foundations of the doctrine:

56 “Let us clear from the ground the metaphysical or general principles upon which, from time to time, *laissez-faire* has been founded. It is *not* true that individuals possess a prescriptive 'natural liberty' in their economic activities. There is *no* 'compact' conferring perpetual rights on those who Have or on those who Acquire. The world is *not* so governed from above that private and social interest always coincide. It is *not* so managed here below that in practice they coincide. It is *not* a correct deduction from the principles of economics that enlightened self-interest always operates in the public interest. Nor is it true that self-interest generally *is* enlightened; more often individuals acting separately to promote their own ends are too ignorant or too weak to attain even these. Experience does *not* show that individuals, when they make up a social unit, are always less clear sighted than when they act separately.”<sup>[4]</sup>

- 57 The above was of course only one salvo in Keynes's long battle against economic orthodoxy which he waged throughout the 1920s and the 1930s. This included his critique of monetary orthodoxy which took Britain back to the Gold Standard in 1925, a critique passionately argued in *The Economic Consequences of Mr. Churchill*, against then Chancellor of the Exchequer Winston Churchill. As the 1930s wore on and unemployment climbed dramatically, Keynes railed against the so called "Treasury View," stated by Winston Churchill in his 1929 budget speech as follows:
- 58 "The orthodox Treasury view ... is that when the Government borrow[s] in the money market it becomes a new competitor with industry and engrosses to itself resources which would otherwise have been employed by private enterprise, and in the process raises the rent of money to all who have need of it."
- 59 This proclamation of the impotence of fiscal policy in the face of massively underused labor and capital was the policy spur for Keynes (1936) to develop the arguments crystallized in his *General Theory of Employment, Interest and Money*, ushering in, analytically at least, the era of Keynesian economics.
- 60 And yet, for Keynes the object was not to destroy markets and capitalism, but to save them from themselves. The easy association of Keynes with policy interventionism belies his conservatism once what he saw as the major market failures were addressed by government policy:
- 61 "We cannot therefore settle on abstract grounds, but must handle on its merits in detail what Burke termed 'one of the finest problems in legislation, namely, to determine what the State ought to take upon itself to direct by the public wisdom, and what it ought to leave, with as little interference as possible, to individual exertion.' .....Perhaps the chief task of economists at this hour is to distinguish afresh the *Agenda* of government from the *Non Agenda*...."The important thing for government is not to do things which individuals are doing already, and to do them a little better or a little worse; but to do those things which at present are not done at all."[\[5\]](#)
- 62 This tension between fixing market failures one by one, or questioning the market system wholesale, is one which runs through economics as it interacts with economic policy.
- 63 **1.4 The Post-War Consensus in Macroeconomics and Its Breakdown**
- 64 The "Keynesian Revolution" is perhaps an apt description for the change in economics and in economic policy, especially in the domain of macroeconomics, from the mid-1930s onwards. Young economists

of the time took up Keynesianism with great fervor, including Paul Samuelson in the USA, whose best-selling text book *Economics* spread the vision to a generation of students the world over. The basic economic models taught in Universities were those of Keynes and his followers, and the basic economic policies pursued by post-war governments were also Keynesian, using fiscal policy to regulate the economy, and especially to keep unemployment low. Right through the 1960s and into the 1970s, these models and these policies ruled the roost.

- 65 An iconic analytical construct of this time with enormous policy impact was the “Phillips curve”, named after A.C. Phillips, an academic economist who posited and estimated an empirical relationship between the rate of unemployment and the rate of inflation. The lower the rate of unemployment, the higher the rate of inflation. Economic analysis thus seemed to have quantified a key tradeoff for economic policy makers. Given their preferences between unemployment and inflation, they could locate themselves as they wished along the “Phillips curve.”
- 66 However, as the long post-war boom came to an end with the OPEC price increases of the mid 1970s, the empirical foundations of the Phillips curve were beginning to be questioned. It came to be argued, a quarter century after the end of the war and the triumph of Keynesian doctrine, that in the macroeconomic arena there was in fact no stable Phillips curve, and a little less unemployment could not be purchased at the cost of a little more inflation—the cornerstone of post-war Keynesian economic policy making. In fact, it was argued, each economy had a “natural rate of unemployment” given to it by the workings of the market system, and attempts to lower unemployment below this could only lead to accelerating rates of inflation. As famously stated by Milton Friedman in his Presidential Address to the American Economic Association:
  - 67 At any moment of time, there is some level of unemployment which has the property that it is consistent with equilibrium in the structure of real wages ... The ‘natural rate of unemployment’ ... is the level that would be ground out by the .....system of general equilibrium equations..... (Friedman, 1968, p.8).
  - 68 Friedman of course went on to win the Nobel Prize in economics in 1976. This shift in economic theorizing coincided with a corresponding move away from an interventionist stance in economic policy making, in macroeconomics and as well as at the micro and structural level in terms of the operation of markets. In the “Reagan-Thatcher-Kohl” years of the 1980s there was a decided shift towards free market orthodoxy of the *laissez faire* era, which Keynes had railed against in the 1920s and 1930s. But in the post-war years

this long running battle between laissez fair and interventionism also played out in developing countries. We now turn to this story, told through the eyes of a giant of development economics, W. Arthur Lewis.

69 **1.5 W. Arthur Lewis, Economics and Economic Development Policy**

70 W. Arthur Lewis, who won the Nobel Prize in economics in 1979, was born on the British West Indies island of St. Lucia in 1915 and studied economics at the London School of Economics. Lewis imbibed the economics of Keynes in the 1930s, despite being a student and then teacher at the London School of Economics where laissez faire liberalism had a stronghold with the presence of Lionel Robbins and Friedrich Hayek. He also participated in the decolonization debates of the 1930s as a student, and then joined the Colonial Economic Advisory Committee of the British Colonial Office as the 1930s and 1940s turned to the decolonizing 1950s and 1960s. In the 1950s, Lewis became deeply involved in economic policy making in Ghana, the first independent nation in black Africa, as economic adviser to Ghana's charismatic leader Kwame Nkrumah. How did this coming together of economic analysis and economic policy work out?

71 Arthur Lewis received an invitation to advise the soon to be independent nation of Ghana in 1952, when it was still the colony of Gold Coast, and he was asked to write a report on industrialization. At that time Lewis was developing his famous theory of "economic development with unlimited supplies of labor" (Lewis, 1954), for which he would win the Nobel Prize. His framing was with reference to the development of countries like India and Egypt. He characterized these countries as having surplus labor in agriculture and traditional activities, so that the path to growth was through industrialization, which would draw on the labor pool. To the extent that this industrialization was being held back by failures of the market, Lewis advocated intervention and government support to build up manufacturing, true to his skeptical position on laissez faire.

72 With this background, the radical policy interventionists in Ghana were expecting support from the eminent economist Lewis for their plans for government subsidized manufacturing. However, Lewis disappointed them (much as he "pleasantly surprised" administrators at the Colonial Office). His analysis of the situation was that in Africa, unlike in Asia, there was labor shortage not labor surplus. The constraint to growth and development was not manufacturing growth but low agricultural productivity. The focus on market failures should thus be in agriculture and not in manufacturing: "Number one priority is therefore a concentrated attack on the system of growing food in the Gold Coast, so as to set in motion an ever increasing productivity..." (Lewis, 1953, paragraph number

253). This line of reasoning continued into Lewis's period as resident economic adviser in Ghana during 1957-1958 and eventually led to a break with Kwame Nkrumah.

73 The break itself occurred over the Five Year Plan, in which Lewis felt that many "white elephant projects" were being promoted for political reasons: "Alas, the main reason for this lack of balance is that the plan contains too many schemes on which the Prime Minister is insisting for "political reasons." (Lewis, quoted in Tignor, 2006, p. 167). Nkrumah, who is famously reported to have said "seek ye the political kingdom first," responded as might be expected. He emphasized, "political decisions which I consider I must take. The advice you have given me, sound though it may be, is essentially from the economic point of view, and I have told you, on many occasions, that I cannot always follow this advice as I am a politician and must gamble on the future" (Quoted in Tignor, 2006, p. 173).

74 This gulf between "sound" economic advice and the political reality of economic policy making continued to be a theme in Lewis's later writings even after he had left Ghana and returned to the safety of academic economics at Princeton University (Lewis, 1965). But Lewis's careful, market by market analysis of market failure highlights a strand in policy analysis carried out by economists which does not always sit well with policy makers or social theorists looking for "big" answers to "big" policy problems (Kanbur, 2016b).

75

## 76 **1.6 The Washington Consensus and The End of History**

77 The balance between state intervention and market orientation, which Edmund Burke referred to as "one of the finest problems in legislation" and which Arthur Lewis attempted to walk the tight rope on in his economic advisory work, reflects in many ways the pendulum swings that have taken place in development economics policy and in economic policy more generally.

78 The laissez faire liberalism of the late 19th and early 20th century gave way to Keynesian interventionism in the 1940s and 1950s, and this transition was reflected in policy making in developing countries as well, as shown in Kwame Nkrumah's predilection for government subsidized efforts at industrialization. The Indian Five Year Plans of the 1950s and into the 1960s and 1970s were all supportive of industrialization through import substitution (Kanbur, 2008). However, by the 1970s and 1980s doubts had set in about this "inward oriented" strategy. The seeds of questioning are to be found,

for example, in the Oxford economics doctoral thesis of Manmohan Singh, later Finance Minister and Prime Minister of India, (Singh, 1964) and in Bhagwati (1970).

- 79 Of course this move in India came at a momentous time in global politics and at the time of crystallization of certain tendencies in thinking. The “Reagan-Thatcher-Kohl” decade ended with the fall of the Berlin Wall in 1989. In the same year, John Williamson (1989) coined the term “The Washington Consensus” which came to capture a neo-liberal economic stance in policy making, and Francis Fukuyama (1989) famously proclaimed “The End of History.”
- 80 As we now know, “The end of history lasted for such a short time” (Kanbur, 2001). Fukuyama (2014) has himself reconsidered the finality of his proclamation in the political realm. On the Washington Consensus, Williamson (2002) commented on how his term had been (mis)used. In any event, the economic liberalizations of the 1980s and 1990s either had mixed results (for example the “lost decade” of low economic growth in Latin America and Africa) or, when there was success (for example in China), there is debate about how true economic policies were in these countries to laissez faire liberalism. Further, the sharp rise in inequality in many countries (Kanbur, 2014) raised the question of the connection between liberalization and the inclusivity of economic growth.
- 81 Thus, even before the financial crisis of 2008, the swing towards laissez faire liberalism in development economics and development economic policy had abated. The Growth Commission, which reported just before the crisis, captured this movement. The Commission, chaired by Nobel Prize winner Michael Spence, had leading economists and leading economic policy makers as members. The Report of the Commission (Commission on Growth and Development, 2008, p.4) reflected a well-balanced view on the debates of the previous two decades:
- 82 "In recent decades governments were advised to "stabilize, privatize and liberalize." There is merit in what lies behind this injunction- governments should not try to do too much, replacing markets or closing the economy off from the rest of the world. But we believe this prescription defines the role of government too narrowly. Just because governments are sometimes clumsy and sometimes errant, does not mean they should be written out of the script. On the contrary, as the economy grows and develops, active, pragmatic governments have crucial roles to play."
- 83 But then the financial crisis struck and the economics of laissez faire liberalism was questioned even further.

- 85 A decade before the great financial crisis of 2008 there was the Asian financial crisis of 1997, which was argued by many to be the culmination of the previous decade of liberalization of capital controls. Those debates have now receded into history, but they pitted proponents of setting markets free in cross-border capital flows against those who warned that such liberalization would lead to instability and crisis. A leading example of the critics is Joseph Stiglitz, who sees a direct link between his Nobel prize winning research in the operation of markets with imperfect information (Stiglitz, 2002a), and a range of policy issues including capital controls (Stiglitz, 2002b).
- 86 But it seemed that the lessons of the crisis of 1997 were never learnt, or were slowly forgotten, as the financial boom of the early 2000s took hold, driven by the development of financial derivative instruments which had themselves been incentivized by the long march of deregulation of financial markets in the 1980s, 1990s and 2000s. The development of the infamous “sub-prime” mortgage instruments, and their bundling and hiding into ever more complex financial products, eventually came unstuck and precipitated the deepest financial crisis since the Great Depression of the 1930s. Economic analysis was implicated in the development of the crisis and the policy responses to it.
- 87 Famously, the Queen of England asked economists why nobody had seen the crisis coming, and the British Academy (2009) responded with a letter which concluded as follows:
- 88 “Everyone seemed to be doing their own job properly on its own merit. And according to standard measures of success, they were often doing it well. The failure was to see how collectively this added up to a series of interconnected imbalances over which no single authority had jurisdiction. This, combined with the psychology of herding and the mantra of financial and policy gurus, led to a dangerous recipe. Individual risks may rightly have been viewed as small, but the risk to the system as a whole was vast.”
- 89 It is interesting to note the ancestry of this assessment, in Keynes’s indictment of *laissez faire* quoted earlier: “It is *not* a correct deduction from the principles of economics that enlightened self-interest always operates in the public interest.....Experience does *not* show that individuals, when they make up a social unit, are always less clear sighted than when they act separately.”[\[6\]](#)

90 The response to the crisis reignited many of the debates of the 1930s on the use of monetary policy and fiscal policy. The Chairman of the United States Federal Reserve Board, Benjamin Bernanke, is a renowned scholar of the Great Depression and used the monetary policy instruments at his disposal to shore up the economy, as did central banks around the world (Bernanke, 2015). But the failures came on the side of fiscal policy, where a modern version of the “Treasury View” that Keynes railed against seemed to prevail. Fears of the consequences of a high level of public debt (for example, Reinhart and Rogoff, 2011) were set against the Keynesian instinct to expand public expenditure at times of severe unemployment of labor and capital (for example, Krugman, 2013).

91 It is fair to say that the “Treasury View” won in the fiscal battle, leaving a more depressed global economy for longer than necessary. Policy makers appear not to have been responsive to addressing mismatches between large savings, especially in Asia, and great infrastructure needs the world over (Spence, Leipziger, Manyika and Kanbur, 2015). The debate continues, and the interactions between economic analysis and economic policy remain as involved and as intricate as ever.

## 92 **1.8 Rising Inequality: Economic Analysis and Policy Concerns**

93 As argued at the start of this essay, distributional concerns have always been present in economics as a discipline, although the strength of those concerns have of course waxed and waned over the quarter millennium of its relative independence from moral philosophy.

94 The best example of the coming together of academic analysis and popular and public concern is the phenomenal success of the book by Thomas Piketty (2014), *Capital in the Twenty First Century*. First published in French in 2013, it was translated into English in 2014 and reached number one on the New York Times best seller list for hard cover non-fiction. That an 800-page economics book with charts and graphs, and even an equation or two, should sell so well to the general public shows how it captured the Zeitgeist marked also by the “Occupy Wall Street” movement and the immediate popular recognition of the “1% versus 99%” distinction.

95 In fact, Piketty (2014) was the culmination of two decades of detailed empirical work by economists documenting the rise of inequality and its causes (see discussions in Piketty and Saez, 2003; Kanbur, 2014; Atkinson, 2015). Piketty’s (2014) powerful thesis is that rising inequality is the natural tendency of capitalism and needs to be mitigated through active economic policy. Indeed, inequality has actually fallen in Latin America in the 1990s, 2000s and 2010s. This

has been put down to proactive policy on the part of Latin American governments to counteract the global forces of technical change, which are tending to displace basic labor and increase demand for skilled labor and capital (Kanbur, 2014).

- 96 It is often argued by social scientists that economists ignore distributional considerations and are only concerned about “efficiency.” I have argued (Kanbur, 2002) that this is inaccurate and in fact precludes a more interesting and important characterization. The instincts of economics as a discipline are marked not so much by a neglect of distribution and a focus on efficiency but a deep seated drive to *separate out* efficiency from equity, especially in the policy arena. Thus James Meade, who won the 1977 Nobel Prize in economics and was known as a prominent egalitarian, nevertheless wrote the following in his *The Intelligent Radical's Guide to Economics* (Meade, 1975):
- 97 “In a competitive system those citizens who are well endowed from birth with inborn capacity or inherited wealth and social contacts and who are favored by the luck of the market may earn much higher incomes and accumulate much higher properties than the less fortunate members of society. The intelligent radical does not draw the conclusion that the competitive market should be abandoned, but rather that far reaching direct fiscal measures should be taken by budgetary taxes and expenditures to moderate high, and to supplement the low, income and properties.... In general... the intelligent radical will advocate more direct general measures for the redistribution of income and properties in preference to particular interventions in particular markets for this purpose.”
- 98 It is this separation of efficiency from equity which has been questioned by other Nobel Prize winning economists such as Sen (1999) and Stiglitz (2012).
- 99 Economics as a discipline, and as an engine for policy analysis, is a battle ground between these pulls, to separate out efficiency from equity on the one hand and to view them as an integrated whole on the other. The strong empirical trends identified in the work of Piketty (2014) and others have also spurred new theorizing on how the working of markets needs to be conceptualized differently from the standard *laissez faire* framework if we are to explain the stylized distributional facts of the past two decades (Kanbur and Stiglitz, 2015).

101 This quick run through the history of economics and economic policy making highlights the two fundamental questions which face economics as a discipline. First, what is the appropriate way to capture the workings of the economy, at the micro and at the macro level? Second, what is the appropriate way to evaluate economic outcomes? I have argued that economics is characterized by disputes and debates along these two axes. Laissez faire liberalism embodies a view of markets as functioning well, without impediments of imperfect information or concentrations of economic power. The analytical foundations of this perspective, or rather the conditions under which it has credence, also rationalize a tendency to be found in many strands of economic policy making, namely the separation of efficiency considerations from distributional ones. Thus, those who find themselves at opposite ends of these two axes will generally differ in their policy recommendations and have done so throughout history.

102 The two axes also explain the phases of cycles and swings of seeming consensus on economic policy—from market orientation to state interventionism and back again. I have argued elsewhere (Kanbur, 2016a) that the interaction between economics and economic policy making is centered on what Edmund Burke called 'one of the finest problems in legislation, namely, to determine what the State ought to take upon itself to direct by the public wisdom, and what it ought to leave, with as little interference as possible, to individual exertion.'<sup>[7]</sup> Keynes, despite his searing critique of laissez faire liberalism, agreed that "the chief task of economists at this hour is to distinguish afresh the *Agenda* of government from the *Non Agenda*."<sup>[8]</sup> This is indeed the question of every hour; it is the eternal question of political economy, posed and formulated by each generation in its own terms and in its own context. Since the policy question is constant, and the analytical axes are well set, it is perhaps not surprising then that the answers themselves have cycled, and will cycle, with some regularity (Kanbur, 2016a).

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## 103 2. Research on education and social progress

104 Education, broadly understood as the process of transmission of skills, values, beliefs, information and habits between generations and individuals, is one of the central features of human societies and a major subject for social research. In modern societies, all persons are expected to spend a significant part of their life attending learning institutions starting with elementary education and care,

which are organized in complex systems of (pre)schools, universities, on-line and other learning organizations, staffed by a large number of education professionals and fueled by vast amounts of public and private money.

105 Research on education brings together skills and traditions of educational scientists, psychologists, sociologists, political scientists, neuroscientists, historians, economists and philosophers, with no established frontiers between these different specialties. Research areas range from the ways learning takes place in the human mind, in the interface between biological development, the evolution of the brain, and the family and social context in which education takes place, to the ways education systems are organized and differ between different societies and cultures, as well as for different age groups – infants, adolescents, young adults, through life.

106 Most societies place very high expectations on education, considering it a key mechanism for social progress, concerning different but related goals (see Chapter 19): as an economic goal, by developing skills to participate in the labor market and workforce and therefore increasing productivity and providing better living conditions for individuals and societies; as a civic goal, by developing civic capacities to strengthening the values of social cohesion and participation, and enabling the persons to participate in political institutions and fully social life; as an instrument for social equity, by overcoming socially ascribed differences and expanding opportunities for social mobility and as a humanistic goal and therefore as a value by itself, by developing the fullest array of human talents, knowledge and interests. A large part of education research deals with these expectations and the ways they can be fulfilled.

107 The section starts with a brief historical view and a paragraph on education and social progress. Then the way the four goals of education have been pursued are described. After a short paragraph on the assessment and explanation of the effectiveness of education, the two key pillars for improvement with the highest consensus are described. The final part focuses on 21st century challenges.

## 108 **2.1 Historical and comparative research on education and society**

109 Today, most persons take for granted that formal education occurs in specialized institutions and is provided sequentially to groups of students organized according to their ages. Comparative and historical studies, however, show that this arrangement is linked to a peculiar development of Western societies, which was later disseminated, with different arrangements, to the rest of the world. In his overview of the field, Randall Collins points to four main, broad types of education, those bringing together an entire community or a

particular age group, associated with rites of passage into social life and adulthood; apprenticeship systems associated with different segments of society, such as professional guilds, families, and religious sects; the education for the licensed professions, granting degrees and professional privileges recognized and sanctioned by society as a whole, which gave origin to the modern universities; and bureaucratic schools with their hierarchy of grades, examinations and degrees, with which the third type is associated (Collins 2000, p 214). A detailed description of these four types shows that organized education started in most societies as institutions for adults, such as the schools of philosophy and rhetoric in Ancient Greece, the apprenticeship systems of the professional guilds in Europe, the Confucian schools in China, or the education of Brahmins in India and Jewish Rabbis. The education for the professions for lawyers, physicians and theologians date from ancient societies in Greece, Rome, and the Islamic world. The Christian university, with its tradition of autonomous corporation and self-governance, was a peculiar development of Western Europe. The earliest example of bureaucratic education was the Chinese Imperial Examination System, and became established and widespread with the German university revolution of the early 18th century.

110 Historical and comparative studies show how educational institutions and practices are strongly related to the social structure and stratification of different societies, and one of its main functions is to strengthen the society's common values and beliefs and the social standing of specific groups, leading to theories that the main function of education is the reproduction of social stratification and credentials (Bourdieu and Passeron 1970, Collins 1979, Bowles and Gintis 1973). At the same, education is often sought by specific groups in society to enhance their social standing and lead to social change, and the expansion of education and modern science in Western Europe has been interpreted, in the analytical perspective inaugurated by Max Weber, as part of the broad process of rationalization and individualism associated with the Protestant reform and the rise of capitalism (Archer 1979, Merton 1938, Ben-David 1965, 1971).

## 111 **2.2 Education and social progress**

112 The expansion of formal education is related to the emergence of the nation states and the modern economy. The notion that all persons should be able to read the sacred books was part of the Jewish, Christian, and Muslim traditions but was never fully practiced and mostly limited to men (Hanna 2007, Gawthrop and Strauss 1984,

Botticini and Eckstein 2012). This notion was adapted and spread out by the modern, industrialized Western nation states, and exported to some degree to their colonies and areas of influence.

113 Access to formal education expanded dramatically since after World War II, and continued to grow ever since. In 1950, about 47% of the children aged 5-14 in the world were enrolled in some kind of school. In 2010, 89.1% of the children were, varying from 98.7% in the European Union to 84.2% in the Arab World (Benavot and Riddle 1988). Secondary education, which used to be mostly a preparatory stage for the universities, became part of the regular school system, starting with the "high school movement" in the United States and spreading later to Western Europe and other countries. Worldwide, the number of secondary school students went from 187 to 545 million between 1970 and 1990, a threefold growth, attending 63% of the relevant age group worldwide. Higher education, which used to be limited to a handful for elite universities, became a mass phenomenon in seventies and almost universal in several developed economies, reaching 32 million students worldwide in 1970 and 182 million in 2010, a 5.6-fold growth (World Bank 2015) (Schwartzman, Pinheiro, and Pillay 2015, Trow 2000, Schofer and Meyer 2005, Goldin and Katz 1997).

### 114 2.3 The economic goal of education

115 Economists have coined the expression "human capital" to refer to their interpretation of education as a factor of production. Empirical research has shown again and again that individual investments in education leads to higher income and that countries that expand and improve the quality of education are more likely to develop their economy (Becker 1973, Schultz 1970, Mincer 1958, 1974). Economic research assumes that investments in human capital are rational responses to a calculus of expected costs and benefits, which would explain why it takes place not only in the Western world, but also in low income countries and countries with very different cultures. Research on the economic dimensions of education seeks to explain the logic behind the individual and collective investments in education, the productivity of these investments at different moments of the life-cycle, the rates of return of investments in different countries and levels of education, the transitions between school and the workplace, and the mechanisms that explain the differences in productivity of different types of education institutions and practices, not only in economic terms, but also in terms of its impact on social equity and other goals such as crime, health and civic values (Hanushek, Machin, and Woessmann 2011 - 2016).

116 The expansion of education was also a response to growing aspirations for social mobility. Education came to be perceived as an individual right, expected to pave the way for different forms of participation, including the benefits of individual choice, good employment and income, as well as social prestige. After World War II, the right to education was enshrined in Article 26 of the Universal Declaration of Human Rights, and embodied in the work of international organizations such as UNESCO, that not only spread the gospel of expanding education, but also helped the countries to organize their school systems. In 1990 the *Jomtien World Conference on Education for All* set the target to provide free and compulsory primary education for all children in the world, with the financial and technical support of public and private donors. This was enforced through UN Millennium Development Goal 2, which aimed to achieve universal completion of a full cycle of primary education by 2015, and by the new Sustainable Development Goal 4, with the headline 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.'

#### 117 2.4 The civic goal of education

118 For the modern nation states, public education was considered a tool for social cohesion and citizenship, and a means to develop the human resources necessary for running the state and enhancing the economy. Religious organizations and churches continued to participate strongly in education, sometimes in partnership and sometimes in dispute with the nation states. Business sectors also got involved, either creating their own systems of vocational education or participating in the shaping of education policies.

119 The main role of the schools in modern societies, as expressed by Émile Durkheim in France, was to make the student understand his country and his time and prepare him to take his part in the collective tasks as a citizen, providing a link between the private life in the family and the public life in society. A fully educated citizen should be disciplined, attached to his social group, and endowed with autonomy and self-determination, provided by rationality (Nisbet 1965, Wesselingh 2002, Durkheim 1922). Reactions to the conservative tone of the Durkheimian tradition, in the context of a changing world, led to alternative pedagogical approaches putting more emphasis on critical thinking, communitarian values and individual self-determination (Peterson 2011, Biesta, De Bie, and Wildemeersch 2014, Benson, Harkavy, and Puckett 2007, Apple 1996, Freire 1970, Dalton and Welzel 2014).

120 The way these ideas were included in the school curricula in different countries, were absorbed by the students, and had the desired effects, varied enormously, and are difficult to ascertain. It was

dependent on the country's changing political climate, the teachers' prevailing ideologies, the way they were taught, and the students' socioeconomic and cultural backgrounds.

## 121 2.5 Education as means to reduce inequality

122 Inequality in access and outcomes of education is a major issue and is a major topic of research. Since the classic studies by James Coleman in the United States, it became clear that both access and education achievement are strongly correlated with the social conditions of the students and their families, race and poverty, which can only be reduced by the schools to a limited extent (Coleman 1966, Jencks and Phillips 1998). The impact of social conditions starts with the home environment and intellectual and emotional stimulus in the children's first years (Cunha et al. 2005), which have strong impact in the individual's lifelong achievements, and also by the kind of schools they attend later on. Inequality can be impacted by *equity in access* to distinct forms/types of schooling (public fee-paying, public no fee-paying, self-funded private or grant-funded private schools); by *equity in provision* in respect to dosage (class size, student-teacher ratios, teaching and learning time, ability to learn at home, language choice, technology, infrastructure); and by *equity in quality* (teaching standards, pedagogical methodology, materials, curriculum and curriculum coverage). More schooling does not make a better education. Thus, reducing inequality correlates with addressing the challenge of how to ensure that the access to schools is matched by real learning happening in each classroom (OECD 2012).

123 Some countries have developed highly differentiated systems, with general and vocational and university and non-university institutions. There are very different expectations/predictions about the role of Vocational and Educational Training (VET) in inequality. On the one hand, VET increases labor market returns for the poor; on the other hand, it helps to maintain social stratification. So, when public investment is concentrated on an elite higher education system, it will increase private returns. However, if educational investments are more evenly distributed across education sectors, then the private benefits are more equally distributed. Conversely, when governments invest heavily in VET instead of higher education, the private benefits will accrue more towards the lower half of the skill distribution (Busemeyer and Thelen 2015). The limitations of vocational education associated with the dominance of general education and growing aspirations for higher education degrees raises the issue of how to deal with the large number of students that, in most countries, never acquire the minimum competencies required by compulsory education, which, according to a recent OECD report, affects one in four 15-year-old students in the OECD countries (OECD 2016). The situation in low income societies is

much worse. There are many strategies to make education more attractive, meaningful and accessible for the students, but the fact remains that millions of students, in rich and mostly in low income countries, go through school without learning to read and understand a simple text, to solve a simple arithmetical problem, or to have a grasp of very simple scientific facts.

## 124 **2.6 Assessing and explaining the effectiveness of education**

125 A large part of the research effort on education is dedicated to measure its effectiveness, in terms of its broad goals – economic, civic, social equity, and humanistic – and explain the reasons for the observed effects. Issues on education as human capital includes the weight of education on economic productivity, the study of education-related wage differentials, the mismatch and patterns of transition from school to work, the relative economic returns of different levels and types of education, and others, and all factors that can lead to these different outcomes, both at the individual and the institutional levels (Hanushek, Machin, and Woessmann 2011 - 2016).

126 The notion that more education leads to more democracy has been a central assumption of social sciences, since at least the pioneering writings of John Dewey in the early 19th century, and was also the subject of the work of leading authors, such as Seymour M. Lipset (Lipset 1960, Dewey 1916), and more recently, linked to the concept of social capital and social cohesion, which links back to the earlier writings of Émile Durkheim (Coleman 1988, Fukuyama 2000, Putnam 2002). Empirical evidence and the historical record, however, have shown that these links cannot be taken for granted (Acemoglu et al. 2014, Ringer 1990, 1979)

127 The links between education and equity have been approached at different levels, from the impact of individual differences on school achievement and social mobility to the equity issues related to stratified education systems. At the micro level, there is a large and controversial literature on the relative weight of inherited vs. acquired intelligence and learning capabilities on education achievement, and, particularly in the United States, on the impact of race differences (Knudsen et al. 2006, Jencks and Phillips 1998). At the macro level, a central issue has been the different impact of differentiated vs. more homogeneous education systems on social equity (Teese 2011). A central issue regarding equity is the effects of affirmative action policies in access to education to compensate for the inequalities associated with meritocracy (Darity Jr. 2005, Sowell 2004). The prevailing consensus is that social and economic conditions, and the quality of the education provided, are the main determinants of educational equity; that education systems that

provide more choices and opportunities according to the student's abilities, interests and social conditions, tend to be more equitable than those that do not take these preconditions into account.

128 Education institutions have always assessed the extent to which the students learn what they are supposed to at different stages of their student life. An important development of the last decades has been the development of large scale, standardized assessment of student achievement, both within countries (such as the National Assessment of Educational Progress in the United States), and internationally, with the comparative assessments such as the Trends in International Mathematics and Science Study (TIMSS), OECD's Programme of International Assessment of Student Assessment (PISA), and from UNESCO's Latin American Laboratory for Assessment of the Quality of Education. These assessments have been criticized from different grounds, as being Eurocentric, as neglecting other, more qualitative dimensions of education, and of leading the schools to teach to the test. At the same time, they have generated large depositories of information on the characteristics of students, their families, their schools and their practices, which are being widely used to learn about the different individual and school characteristics and practices that can lead to better outcomes.

## 129 **2.7 Key pillars for improvement**

130 Among the vast amount of findings produced by the social sciences on education, one of the most important consensuses is the realization that early childhood education and care, if of good quality, brings a wide range of benefits, including better child well-being and learning outcomes; more equitable outcomes and reduction of poverty; increased intergenerational social mobility; higher female labor market participation and gender equality; and better social and economic development for society at large (Kamerman 2000, Campbell et al. 2002, Clarke-Stewart and Allhusen 2005). Exposure to high-quality care appears especially important for at-risk children's later school success (Rolnick and Grunewald 2003, Early et al. 2007, Heckman 2006). The literature clearly shows that money invested in early childhood development and education yield extraordinary public returns. Governments are increasingly working to assist families and support children. Between 1998 and 2011, public expenditure on young children in the form of childcare and preschool increased 55% on average across OECD countries. However, there are large differences in the percentage of their GDP the countries spent on childcare and preschool.

131 The second consensus is the crucial role of teachers. Teachers are not just carriers of knowledge and information. They have a significant impact on children's quality of life – including their relationships with

peers and adults, and their dispositions towards learning and life more generally. They are role models and conveyors of implicit values and modes of behavior which cannot be codified in books or transmitted through new technologies. Besides, teachers and professors are not just school or university employees, but members of established professions and unions that often make the difference on whether education policies succeed or fail (Sachs 2003).

132 Clearly, not all teachers are effective, not all teachers are experts, and not all teachers have powerful effects on students. (Hattie 2008, Hanushek and Rivkin 2006, Rivkin, Hanushek, and Kain 2005). The IEA Teacher Education and Development Study in Mathematics (TEDS-M) showed considerable variation in national policies related to quality assurance, entry requirements, program length, and the opportunities to learn as well as differences in the organization and types of teacher education programs within and across the participating countries. Countries with programs providing the most comprehensive opportunities to learn university and school-level mathematics tended to have higher scores on the TEDS-M tests. The data further indicated a positive relationship between the strength of quality assurance arrangements and future teachers' mathematics and pedagogy knowledge (Ingvarson et al. 2013).

## 133 2.8 21st century challenges

134 While the evidence-based movement has gained greatly in impact, especially in Anglo-American contexts (Kratochwill & Shernoff, 2003), there are considerable differences in the uptake of research findings among public service areas and scientific disciplines (Nutley, Walter, & Davies, 2007). Particularly in the field of education, there has not been extensive implementation of the body of evidence-based research, and the adoption of prevention and intervention programs is often driven more by ideology than by evidence (Forman et al. 2013). Implementing programs, e.g., new teacher education, into practice and in the wider range of public policy has often failed (Fixsen et al., 2009, 2013). There is large-scale agreement about one of the central reasons for this disappointment: program evaluation has not historically included any mention or systematic study of implementation (Meyers, Durlak, & Wandersman, 2012). One big challenge for the 21st century will therefore be to take up the models and empirical findings provided by the field of implementation science “the scientific study of methods to promote the systemic uptake of research findings and evidence-based practices into professional practice and public policy” (Forman et al., 2013, p.80).

135 A central feature of education systems is the constant discussion and revision of how and what the schools should teach and how best to make the students learn and benefit from the education they receive.

In recent years, many countries have developed detailed core curricula they assume the students should learn, or the set of competencies the students should acquire; tried different approaches of how make the schools to teach best, experimenting with different teaching methodologies, from more open, student-based, constructive and participative to more structured, top-down, teacher-centered approaches; adopted the use of new information and communication technologies; and changed the ways the schools and school systems function, changing the ways they are managed and financed and made accountable for their results. The relationships between research findings and the effectiveness of education policy, however, are elusive, both because the evidence supporting the proposed reform is not strong, or because the implementation is too complex or strongly resisted by different sectors in the school establishments (Stevenson 2006, Clark 1987, Cerych, Sabatier, and European Institute of Education and Social Policy 1986, Olsen 2007). Nevertheless, the balance between core subjects and new 21st century skills including cultural and moral behavior will be a further big challenge. This will also require fresh thinking about performance measures and accountability will be more essential than ever in 21st century education systems.

136 A further big challenge for the 21st century is the role technology should and can have in education. The most dramatic change over the past generation to the lives of both teachers and students is the explosion of digital technology. But a still larger shift is the digital accessibility of knowledge and information. How can learners be trained to value what they find on the internet? It is widely suggested that online technologies can help address issues of educational equity and social exclusion, and open up democratic and accessible educational opportunities. But the IT access gap is contributing to the widening digital divide between haves and have not in LAMICs. Furthermore, using online education requires both high motivation and self-regulated learning competencies. Therefore, not all learners are prepared to profit from technology based education as online courses.

137 Beyond access, much more research is needed on how most effectively to adopt blended learning strategies and to incorporate online learning opportunities in the classroom. But there is evidence, that online education often lacks respective didactical concepts and is not solidly based on learning theories. Mostly, the technology dominates educational concepts and models. The idea that often has driven the adoption of technology in education is to save money and time. But the contrast is the case. High quality and successful use of ICT in education needs time and money.

138 Last but not least, the educational governance is a big challenge for the 21st century. There is no “one size fits all” model of educational governance, which could be transferred from one country to another. In contrast, more attention should be paid to the cultural foundations of educational governance, which have implications for the effectiveness of how governance works in different countries. As all countries will face consequences if today’s learners are not adequately prepared to collaborate and resolve the world’s economic, environmental, health, social, and political challenges, governments are forced to engage in transnational processes of communication, using the potential to learn from each other. Such communication processes can be enhanced by input from evidence-based research. But it has to be considered that education systems are part of broad institutional settings, characterized by shared ideas and values supported by established social structures, which restrain the ability of governments and education authorities to manage them at will (Benavot 1997).

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### 139 **3. The role of social science in environmental policy**

140 A modern environmental movement emerged throughout many parts of the developed world starting as early as the middle of the last century. Members of the global community have increasingly grown aware of and concerned about harms to public health and the environment from industrialization and urbanization (Inglehart 1997). A series of new political and governmental institutions, ranging from specialized government regulatory agencies to political parties to well-established nongovernmental advocacy organizations, have come into existence, and, in many countries, extensive laws and regulations have been established to address environmental concerns. Marginalized communities also began to voice their concerns and organize themselves in the name of environmental justice. In addition, increasing international attention has emerged over global environmental problems, including climate change and its associated implications for natural disasters, agricultural production, and ecosystem viability.

141 The contributions of the natural sciences to advancing environmental policy have been apparent in multiple ways—not the least being in the visible integration of scientific expertise into the identification of environmental problems and the understanding of

the chemical, biological, and ecological relationships that underlie these problems. But at the same time, the social sciences have likewise made many contributions to the understanding of the sources of environmental problems, identifying them principally in individual and collective human behavior. In addition, the social sciences have contributed much to the understanding of the ways that laws and other institutions can be designed to solve environmental problems. In this paper, we seek to distill the major intellectual contributions of the social sciences—notably economics, political science, psychology, and sociology—in both the definition of environmental problems at multiple scales and the conceptualization (and empirical testing) of policy solutions that seek to shape human behavior in ways that improve environmental quality and promote sustainable economic growth.

142

### 3.1 Understanding environmental problems

143

What precisely do we mean by environmental problems? We focus here primarily on the negative byproducts of economic activity—pollution—and other unintended consequences of that activity which pose risks to human health, loss of environmental amenities, damage to ecosystems, or resource-based reductions in quality of human life. For at least thirty years, environmental problems have been closely associated with aspirations for sustainable development, which was famously defined by the Brundtland Commission report as “development which meets the needs of current generations without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development 1987). Whether understood in terms of a more traditional emphasis on the ill effects of pollution and resource depletion, or in terms of the more recent emphasis on sustainability, it is clear that environmental problems do not emerge in a vacuum. They manifest themselves from the interaction of human activities with the environment, often arising from very complex, dynamic systems involving the interaction of economic and social behavior with the natural environment (Matson, Clark, and Andersson 2016). Individuals, groups, businesses, and states endeavor to extract value from natural resources for a range of valuable purposes, but in the process they can degrade or exhaust those resources. How society can, and ought to, account for, prevent, or adapt to environmental and natural resource damages becomes the core problem for environmental policy to solve. Of course, to solve any policy problem, it helps to understand its underlying causes. We highlight here some of the most salient concepts that social scientists have contributed to the process of identifying the economic and social sources of environmental problems.

144

#### 3.1.1 Externalities

145 Economists' conceptualization of environmental problems as a form of market failure has become widely accepted. Although markets in principle allocate goods and services efficiently, market failures can arise when transactions do not accurately reflect the full value of goods and services either to the parties to those transactions or to third parties who are affected by them. Environmental problems take the form of a market failure known as negative externalities—the imposition of harmful effects to third parties as a result of the production or consumption of a good. These externalities, or spillovers, are not reflected in the price of goods and services, and hence the relevant goods and services are oversupplied in the market from the standpoint of society overall. If the price of coal, for example, fails to reflect the full costs borne by society associated with its production, then coal would be, in effect, artificially cheaper than it should be, leading more people to buy it than would be desirable from the standpoint of overall social welfare. If the coal industry “internalized” these social costs, consumers would receive a more accurate price signal of the total costs associated with coal—compelling them to make different choices, such as using less coal or seeking out alternative energy technologies that may have fewer externalities (such as wind and solar) and which would then be more cost-competitive.

### 146 **3.1.2 Transaction costs**

147 At a micro-level, externalities can be understood by reference to economist Ronald Coase's well-known parable of a farmer and a rancher—a puzzle depicting a conflict between two neighbors but which provides a metaphor and analytic framework for understanding all problems of negative externalities (Coase 1960). The Coase Theorem suggests that markets fail in the face of externalities largely due to the existence of transaction costs (Zerbe and McCurdy 1999), for if transaction costs did not exist, the relevant parties could achieve an efficient allocation of resources (Coase 1960; Ellickson 1986). In Coase's parable-world (without transaction costs), the farmer and rancher would bargain between themselves to minimize the sum of both the damages from cattle straying into the farmer's crops and the costs of damage avoidance, such as building a fence. In reality, of course, as Coase himself understood, there do exist very real transaction costs associated with gathering information, negotiating agreements, and resolving disputes over pollution and the use of natural resources. The existence of these transaction costs means that many negative spillovers to market transactions will occur because it is too costly for the affected parties—often many thousands upon thousands of people, not just an individual farmer and rancher—to negotiate “win-win” agreements.

### 148 3.1.3 Public goods

149 Environmental problems like pollution do affect large numbers of people, although the impact that any single polluting source has on any single individual within a large affected population may only be quite modest, even if in the aggregate, across all affected individuals, they are quite large. The asymmetry between the individual and collective impact of many environmental harms gives rise to the well-known problem of collective action (Hardin, 1982; Olson 1965). This problem arises when each individual member of an affected group does not have enough at stake relative to the costs of avoiding the externality (or of mobilizing pressure to have a polluting source move or invest in avoidance). It is often rational under such circumstances for individuals to free-ride on the efforts of others. Collective action problems derive from the fact that many environmental amenities are public goods: that is, they are non-rivalrous (use by one person does deplete from others) and non-excludable (cannot be kept from those who do not contribute to or pay for them). Environmental quality often possesses the characteristics of a public good; everyone can breathe clean air without having paid for it.

### 150 3.1.4 Commons problems

151 Ecosystems and other natural resources also often possess the characteristics of public goods. Garrett Hardin (1968) showed how the public-goods nature of natural resources can lead to what he called the “tragedy of the commons” (Feeny et al. 1990). When resources are shared in common and are non-excludable, it is individually rational for all the users of the resource to maximize their short-run gains from resource use and extraction—say, to graze as many cattle as possible—which leads to crowding, over-use, and eventual degradation of shared natural resources. Although all public goods problems involve issues related to goods possessing the dual characteristics of being non-rivalrous and non-excludable, many commons problems arise from the attributes of a common pool resource being non-excludable but rival in consumption—meaning that use by one person makes that same resource unavailable to another (or potentially diminishes the overall quality of the resource) (Ostrom 1990, 2008). Open ocean fisheries are a classic example of a common pool resource; boats “race to fish” to catch as many fish as possible, and fish taken by one vessel leave the fish stock depleted for subsequent fishing boats in the area, and it is challenging, if not impossible, to exclude boats from fishing in open waters.

### 152 3.1.5 Scarcity

153 Fisheries also illustrate how scarcity poses a threat to many types of natural resources and ecosystems. When fish or other species disappear from an area, it can cause major damage or change to an ecosystem, even resulting in the loss of a natural resource altogether. This natural science imperative has given rise at various times to forecasts of eventual apocalyptic environmental collapse (e.g., Ehrlich 1968). But there is a relevant social science imperative as well: the concept of scarcity is central to economics, as it affects the valuation of goods and services as measured by prices. When it comes to private goods (that is, those that are excludable), scarcity makes them more valuable, assuming constant demand, and the increase in their value can, in turn, provide incentives for individuals to invest in new ways to protect or expand the private resource or to make other technological innovations (Simon 1977). These kinds of economic dynamics, however, apply when markets can price amenities, and thus they do not apply in the same way to public goods, which are not readily amenable to commodification, for the reasons described above.

#### 154 **3.1.6 Environmental equity**

155 Most economic analyses focus on aggregate efficiency—that is, on overall benefits and costs. After all, the principal concern over market failures lies with the overall social costs of economic activity; when externalities exist, pollution becomes over-produced (or natural resources become over-exploited). But environmental problems also raise distributional or fairness concerns as well, as the negative impacts of economic activity are not equally borne by everyone in society. Especially palpable concern has arisen over racial disparities in the imposition of environmental harms, concerns that have been reflected in an “environmental justice” movement in the United States and elsewhere (Cole and Foster 2001).

#### 156 **3.1.7 Global problems**

157 We have focused here on the individual or firm as the “unit of analysis” which gives rise to environmental degradation or the depletion of the natural commons. Yet much the same social science models that illuminate individual behavior have been used to explain the dynamics that contribute to trans-boundary pollution or threats to the global environmental commons, where the unit of analysis is the nation-state (Haas et al. 1993; Esty and Moffa 2012).

### 158 **3.2 Solving environmental problems**

159 Understanding the underlying causes of environmental problems suggests a general approach to solving those problems. When environmental problems are understood as externalities of economic

activity, then the general solution will lie in finding ways to ensure that individuals and businesses internalize those externalities. Although this general solution seems straightforward in concept, determining how best to motivate the internalization of externalities raises challenging policy issues. We consider here the contributions of social science to three main issues: (1) the identification of the policy criteria against which solutions should be chosen or assessed; (2) the general advantages and disadvantages of different environmental policy instruments; and (3) choices about what entities—local, national, or international—should seek to implement solutions and how policy choices should be made.

### 160 **3.2.1 Criteria and values**

161 A perennial question in environmental policy decision-making is, “How safe is safe?” This question arises most clearly in determining how stringent various limits on pollution should be set in government regulations, but in a fundamental way it represents the core question undergirding almost all important environmental policy decisions. It is a question without an easy, uncontested answer, even though too often scholars and policymakers seem to treat “safety” or “environmental protection” as if they are self-evident concepts or ones that can be determined simply by marshaling forth scientific evidence. This tendency has manifested itself in recent years in scholars’ and policymakers’ advocacy of a “risk-based” approach to regulation (Bounds 2010; Wiener 2010; Black, 2008), with the implication being that policy decisions can automatically follow from a clear and rigorous scientific understanding of effects on human health or ecological viability. But natural science by itself cannot determine how (or how stringently) environmental policy should be made, as policy determinations call for making normative judgments in addition to gathering scientific information (Coglianese and Marchant 2004). To be coherent, any risk-based approach to environmental regulation needs to be grounded in a clear articulation of policy criteria (Coglianese 2015; Paoli and Wiles 2015; Rothstein et al. 2006; Finkel and Golding 1995). Principled environmental decision-making depends on value choices about how much pollution should be deemed acceptable—or, more generally, by what criteria should environmental policy decisions be guided. A variety of potential criteria can be discerned throughout the policy-relevant social science literature, although any thorough consideration of them will require some exploration of moral or political philosophy.

162 For our purposes here, we begin with the key criterion from standard welfare economics: efficiency. Efficiency takes into account not only the benefits of environmental policy in terms of reductions in harm, but it also factors in and seeks to balance those benefits with

the costs of achieving them. It can take both benefits and costs into account in two ways. The first way is to follow the concept of Pareto efficiency, which demands that a policy make at least some individual better off but without making any individual worse off. It has sometimes been hypothesized that Pareto efficiency can be achieved with respect to environmental policy through supposed “win-win” options that deliver improvements in the environment as well as cost-savings or other private returns to businesses (Porter and van der Linde 1995). But the empirical evidence indicates that such win-win opportunities are relatively rare and, in any case, cannot achieve anything close to the full internalization of all negative externalities (Palmer, Oates, and Portney 1995).

163 The second, and more commonly accepted, test of efficiency is known as Kaldor-Hicks efficiency. Under this test, more than just win-win options can be efficient. The Kaldor-Hicks test also accepts as efficient any option where the “winners” under a policy (say, those whose water source becomes cleaner) benefit in the aggregate in an amount greater than the costs the policy will impose on the “losers” (say, those businesses that must pay to install equipment to reduce their water pollution). This test calls for the estimation of *net* benefits, which is what is usually applied in benefit-cost analyses of environmental policies (Gramlich 1990).

164 The application of an efficiency test, though, raises a host of analytical and methodological challenges. The underlying risks to be addressed must first be identified and characterized. The enterprise of risk assessment has been largely driven by natural sciences—but not exclusively so (Stern and Fineberg 1996; Jasanoff 1987). After assessing risks, any expected reduction in risks from different policy alternatives must be valued or monetized, either by revealed-preference methods (e.g., extrapolating from how labor markets offer a wage premium for riskier jobs) (Cropper et al. 2011; Viscusi and Aldy 2003; Viscusi 1993) or by stated-preference or contingent valuation methods (e.g., relying on social-science surveys to estimate individuals’ willingness-to-pay for improvements in environmental conditions) (Carson et al. 1992; Covello and Mumpower 1985). Often environmental policies deliver their risk reduction benefits years or decades into the future—something that is especially the case for policies that aim to reduce cancer-causing pollutants, as their effects can have long latency periods. In such instances, the monetized estimates of all policy impacts will be converted into present value terms, raising the need to identify an appropriate discount rate to use in converting estimates to present-value terms (Revesz 1999).

165 The efficiency test—and the resulting use of benefit-cost analysis to determine whether that test is met—has also raised normative critiques and questions which hold implications either more

narrowly for various methodological choices or more broadly about whether to use benefit-cost analysis at all (Bronsteen et al. 2013; Adler and Posner 2006; Ackerman and Heinzerling 2005; Kelman 1981). Some of these questions center on how to value a policy's impacts on future generations (Arrow et al. 2013; Brown Weiss 1990) or on individuals from countries other than those of the policymaker (Rowell and Wexler 2014). Others ask how to value impacts on natural resources that go beyond "use value" to humans, such as whether and how to incorporate "non-use" or "existence" value (e.g., the value of just knowing that certain wilderness areas are protected, even if never planning to travel to them) (Mendelsohn and Olmstead 2009). In some societies, indigenous or aboriginal cultures view these valuation choices—as well as more fundamental epistemological assumptions—in ways different from members of industrialized cultures (Bohensky and Maru 2011; Berkes et al. 2006; Douglas and Wildavsky 1983). Even within industrialized cultures, significant differences can exist in how lay people and experts view different risks (Wynne 1996; Slovic et al. 1981).

166

Although all of these issues arise when the efficiency criterion is applied to environmental policy decisions, a number of these issues, especially those related to estimating risk and risk reduction, can also arise when other policy criteria are used. By and large, though, other applicable policy criteria will dispense with the need to make the valuation judgments involved when benefits must be monetized, as the efficiency test demands. One alternative to efficiency is the criterion of cost-effectiveness, which also accounts for the costs of a policy but does not call for balancing those costs against benefits, and thus does not necessitate any attempt to monetize benefits such as avoided mortality or morbidity or environmental amenities. The cost-effectiveness criterion would point decision-makers toward policies that can achieve the desired level of environmental or health improvement for the lowest cost.

167

Others have proposed using feasibility as a policy criterion, seeking to maximize environmental protection within the constraint of what is feasible (Driesen 2005; but see Masur and Posner 2010). The feasibility criterion is a close cousin to the precautionary principle, which has been widely urged as the better way to make policy decisions about environmental risk (Freestone and Hey 1996). In general, the precautionary principle shifts the burden of proof on those who create potential externalities—for example, those who create new products or processes that could harm the environment or human health. It forbids economic activities until they can be shown to impose no externalities. Although the precautionary principle possesses considerable appeal to policymakers and members of the public, some scholars have questioned its coherence and wisdom (Sunstein 2005).

169 The policy criteria we have highlighted will be used to inform decisions about a variety of possible policy instruments. In this section, we briefly review the key findings from social science research on the major tools available to the environmental policy maker (Richards 2000). All of the tools discussed here have been adopted and implemented by national governmental bodies, so for our present purposes we will treat such bodies as the key policy-makers, even though most of the instruments discussed here could be applied by other decision-makers, whether private or public, international or local.

#### 170 *3.2.2.1 Ex-post liability*

171 One option for addressing environmental problems would be to impose liability on polluters after they cause harm to others. Sometimes referred to as the “polluter pays” principle, ex-post liability could, at least in theory, provide a deterrent effect that leads polluters to adopt preventative measures. Although ex-post liability may be deemed appropriate for special types of environmental concerns or as a general backstop to other options, such liability by itself is generally thought to be insufficient as a principal means of addressing environmental concerns, mainly for the very same kinds of reasons that environmental problems arise in the first place: transaction costs and the problems of collective action. Even with liability, harmed individuals will have an incentive to free ride on others, rather than seek their own costly forms of redress through a liability regime. This dynamic presumably leads to a less-than-optimal level of deterrence—and the continued existence of the very environmental problems policymakers seek to solve. To overcome the shortcomings in ex-post liability, and in an effort to try to prevent environmental harms from occurring in the first place, governments adopt protective, proactive environmental regulation.

#### 172 *3.2.2.2 Means-based regulation*

173 Proactive regulation can take a variety of forms. One form consists of rules directing regulated entities (e.g., business firms) to use particular means of pollution control or to take other specified action to reduce environmental problems. Sometimes characterized as technology or specification standards, examples of these “means standards” include requirements for the installation of catalytic converters on automobiles or the operation of emissions scrubbers on factory smokestacks. This type of regulation is not uncommon in environmental policy. Means standards generally offer greater certainty that regulated firms will take the desired environmentally protective action, and they may also be easier than other types of

regulation for regulatory officials to enforce. Despite these advantages, means standards will often be less cost-effective than other forms of regulation because they mandate the same, “one-size-fits-all” action for every regulated firm. Some firms may not really need to take the required action, or they may have available to them other actions that would prove more effective or less costly.

### 174 3.2.2.3 Performance-based regulation

175 Instead of mandating means, regulation can also mandate the attainment or avoidance of certain outcomes—setting a goal of “what” to achieve but not specifying “how” to achieve it. A performance standard does not require the use of any particular technology or other action; on the contrary, it leaves the means of achieving or avoiding the required outcome up to the regulated firm. All that firms must do is deliver on the outcome (Coglianese, Nash, and Olmstead 2003; May 2011). An emissions limit is a common example of a performance standard.

176 By specifying requirements in terms of outcomes and giving firms flexibility in meeting those outcomes, performance standards can overcome the one-size-fits-all disadvantage of means standards. Performance standards can also better allow for innovation to occur (Jaffe, Newell, and Stavins 2004). For these reasons, many social scientists have recommended performance standards as more cost-effective regulatory instruments.

177 Yet performance standards are not without their disadvantages either. As a fundamental matter, performance standards need a reliable method for measuring firms’ satisfaction of the required outcome conditions. Yet sometimes measurement of outcomes can be difficult with respect to environmental standards. As a practical matter, regulators typically cannot monitor on an ongoing basis the emissions from every smokestack and exhaust pipe that contributes pollution to the air.

178 Furthermore, performance standards can be susceptible to a type of gaming known as “teaching to the test,” which occurs when regulated firms find ways to meet the required outcome but in ways that work to the detriment of the larger purpose of the regulation. A recent example can be found in the Volkswagen’s diesel scandal; the company had installed software that ensured their engines optimized for emissions control while connected to the required testing machine, but then recalibrated and spewed out more pollution when operating under normal, on-the-road conditions (Coglianese 2016). Performance standards may also be somewhat more prone to the

incidence of unintended consequences as firms use their flexibility in creative ways that produce new, unanticipated problems (May 2003).

179 3.2.2.4 *Market Instruments*

180 Although performance standards prove more cost-effective than means standards, they still can be less cost-effective than so-called market-based regulatory instruments. This is because performance standards can suffer from their own type of one-size-fits-all problem: they require uniform levels of emissions control even when the marginal costs for controlling those emissions can vary across different firms. Rather than demanding every firm meet the same emissions limit, market instruments allow for – and even provide incentives for – firms to choose their own level of emissions. Market instruments operate either by setting a per-unit tax on emissions or by establishing a system of tradable emissions permits (Tietenberg 1985).

181 A marginal pollution tax set at the level equal to the social costs of pollution would solve the Coasian bargaining problem and ensure that firms fully internalize their externalities (Pigou 1932). However, the precise marginal social cost of pollution can be difficult to determine, and while a tax provides certainty in terms of costs imposed on firms, it does not provide much certainty about the overall level of pollution that will be reduced.

182 An alternative market-based approach called emissions trading—or simply “cap and trade”—can provide greater certainty about the overall level of pollution reductions. Under a cap and trade system, an overall desired level of emissions is established and a number of aggregate emissions “credits” issued that total the desired level. Each individual firm then receives credits equaling a portion of the overall emissions level; they must keep their emissions below the amount allowed by the permits they possess—much like with any performance standard. But unlike with uniform performance standards, firms can exchange credits under cap and trade, thus varying the level of control each firm must achieve. Those firms with lower marginal costs of control can free up some of their emissions credits by reducing pollution more than required and then sell excess credits to other firms with higher marginal costs of control, ultimately achieving the same overall level of pollution reductions but at a lower cost. These theoretical expectations of greater cost-effectiveness have been confirmed by empirical research (Cropper and Oates 1992; Stavins 2007).

183 Market instruments are, of course, susceptible to some of the same potential limitations as performance standards. They very much depend, for instance, on a reliable means of measuring emissions. Moreover, market-based environmental policy instruments may lead to another particular problem: hot spots. If those firms that buy credits and those that sell credits are located in different areas, pollution levels could become more concentrated in some regions. Research has also investigated whether cap and trade tends to disadvantage smaller firms (Newell and Rogers 2003).

#### 184 3.2.2.5 *Management-based regulation*

185 Management-based regulation does not require firms meet a specific targeted outcome or even adopt any direct means that aim toward a desired outcome, but instead it mandates that firms collect information, develop internal plans and procedures, and engage in other management-related actions that aim indirectly toward reducing environmental problems (Bennear 2006; Coglianese and Lazer 2003). For example, some laws direct companies using toxic chemicals to engage in pollution prevention planning to try to reduce their use of toxics, even without requiring those companies take any specific pollution prevention or control measures—or sometimes without even demanding that they carry out their required plans. In short, management-based regulation aims to solve environmental problems by spurring improvements in private-sector environmental management (Coglianese and Nash 2006).

186 Management-based regulations appear to be suitable when addressing environmental problems where one-size-fits-all means do not exist and where monitoring outcomes is not feasible (Coglianese and Lazer 2003). It has been used to encourage reductions in the use of toxic chemicals and to try to prevent catastrophic industrial accidents. Empirical evidence shows that these regulations can lead to improvements in some measures of environmental quality (Bennear 2006, 2007; Coglianese and Lazer 2003). However, research also indicates that improvements induced by management-based regulations may not be long-lived. Firms appear initially to find low-hanging fruit once they start to manage their environmental affairs more self-consciously in response to management-based requirements, but over time the required planning appears to become more routinized and environmental improvements taper off.

#### 187 3.2.2.6 *Information disclosure*

188 Another regulatory approach requires not just the gathering of information for internal planning purposes, but the affirmative public disclosure of certain kinds of information (Sunstein 1999; Tietenberg 1998). The U.S. Toxics Releases Inventory (TRI) regulation serves as a

prominent example of this policy instrument. TRI requires certain industrial facilities to disclose to the public the volume of toxic chemicals they release into the environment. Some researchers have attributed the decline over time in chemicals reported under TRI as a sign of the policy's success (Thaler and Sunstein 2008; Fung and O'Rourke 2000). Others have shown that observed reductions can be explained instead by other, more traditional forms of regulation operating in the background or by factors other than real improvements in environmental performance (Poje and Horowitz 1990; Natan and Miller 1998; de Marchi and Hamilton 2006; Bennear 2008).

189 Although the precise effects of the TRI law are not known (Hamilton 2005), other research has shown that in other settings information disclosure can sometimes contribute to at least some modest levels of environmental improvement (Bennear and Olmstead 2008). Researchers theorize that information disclosure can reinforce various other legal, market, and social pressures for companies to reduce pollution (Hamilton 1995; Khanna, Quimio, and Bojilova 1998; Konar and Cohen 1997). Furthermore, if the aphorism that “what gets measured, gets managed” rings true, then information disclosure may also operate as a partial form of management-based regulation and induce spillover managerial changes at regulated firms (Karkkainen 2001).

#### 190 3.2.2.7 *Subsidies*

191 The public goods nature of environmental quality can impede private financing for certain kinds of environmental solutions, such as water supply systems or storm-water management. Public financing and subsidies can sometimes be effective policy instruments to fill in gaps in private financing of public environmental amenities. Tax credits for investments in nonrenewable sources of energy are another example of a type of subsidy available to address environmental problems.

#### 192 3.2.2.8 *Voluntary programs*

193 A related approach is to reward firms that voluntarily adopt environmentally responsible actions or achieve high levels of environmental performance. Through so-called voluntary environmental programs, governments sometimes offer qualifying firms technical assistance, awards and public recognition, special eco-labels, or specified forms of regulatory relief. Examples include the U.S. government's “Energy Star” product labeling program or National Environmental Performance Track partnership program (Coglianese and Nash 2014). Some research shows that these kinds of voluntary programs can have a discernible effect on certain environmentally relevant metrics (Pizer, Morgenstern, and Shih

2010), but because the rewards offered firms through these programs are typically modest, they are likely to have only limited value for solving most major environmental problems (Coglianese and Nash 2014).

### 194 **3.3 Choices about sectors, scale, and processes**

195 Just as social science has helped identify and evaluate different policy instruments for addressing environmental problems, it has also clarified several other important, policy-relevant choices. These include choices about who should bear the primary responsibility for addressing environmental problems—specifically, the public or private sector—as well as about the appropriate scale of policy responses—top-down versus bottom-up. In addition, social science research about policy decision-making more generally has made contributions to the design of processes used to make and enforce environmental policy.

#### 196 **3.3.1 Public vs. private**

197 Although governments are major sources of environmental policy, a variety of non-governmental actors also fulfill governance roles (Büthe and Mattli, 2011). Especially in societies lacking in state capacity or for problems that governments are unable or unwilling to address, private third parties can serve as surrogates for (or at times supplements to) governmental actors (Büthe 2010). Sometimes called “private regulators,” business associations or NGOs operating in this capacity derive their authority and legitimacy more through moral persuasion and market power than coercion or force (Green 2013; Cashore et al. 2004). For example, a variety of privately created labeling and certification schemes have emerged to provide global consumers and businesses credible information and assurances related to niche preferences for more sustainable or ethical forms of agriculture and manufacturing (Starobin and Weinthal 2010). These non-state schemes can impose means or performance standards—or any of the types of rules that governments could impose—but they lack the ability to mandate compliance with the threat of state-imposed sanctions. As a result, private forms of environmental governance will bear many similarities to voluntary programs adopted by governments. That said, the market pressures available to business associations, NGOs, and even multinational corporations like Wal-Mart can sometimes create incentives for compliance that rival those provided by state authority (Starobin 2013).

198 Social scientists have investigated why firms willingly undertake to “self-regulate” and voluntarily go beyond bare compliance with the law. Conventional wisdom holds that private certification schemes

offer firms a club good—exclusive reputational benefits available only to those members that achieve the desired level of compliance—thereby distinguishing leaders from laggard competitors in their sector (Prakash and Potoski 2006). Other incentives for self-regulation include product differentiation, access to markets, and, in some cases, a reduction in the probability of eventual governmental regulation. Researchers have sought to evaluate private forms of environmental governance and on occasion have found that they generate improvements in certain metrics, such as days in compliance with regulations and paperwork processing (Prakash and Potoski 2006). As with voluntary programs more generally, it has been harder for researchers to find substantively significant improvements associated with these private voluntary efforts. Concerns exist about the adequacy of implementation of and compliance monitoring associated with non-state forms of environmental governance.

199 **3.3.2 Top-down vs. bottom-up**

200 A perennial issue in environmental policy concerns the scale at which solutions should be sought (Young 2002). With the exception of problems with highly localized impacts, environmental problems often transcend political boundaries, raising the question of whether the responsibility for addressing them should be assumed by national bodies or devolved to lower levels of scale. The choice between a top-down versus a bottom-up set of solutions assumes particular significance for transnational environmental problems, such as climate change.

201 Countries have long relied on international treaties as core policy tools employed to elicit compliance from states to provide global public goods, prevent environmental harms, and protect human rights (O'Neill 2009; Mitchell 2003; Susskind 1994). Yet, in the era of globalization, both states and non-state actors, including businesses, perform nuanced roles that go beyond treaty formation, negotiation, and ratification—and often they must consider whether other, bottom-up policy tools, including private, voluntary initiatives, might prove more effective.

202 Top-down approaches to governing the global environment like multilateral treaties have long been the classic approach to tackling the collective action challenges associated with managing commons at the international scale—seeking to impose on countries a regime under which they make specific commitments (e.g., on ozone depletion, greenhouse gas reductions) related to ameliorating or preventing environmental damages if not also contributing funds toward their remedy, even in other jurisdictions. Yet, these approaches have also struggled at times with issues of effectiveness

and inclusivity (Young 1999; Haas et al. 1993.). Treaties require ratification at the level of the nation-state to become “binding”—even though they still rely upon signatories for enforcement, ultimately depending on the willingness and capability of state-level bureaucracies to integrate international ideas, norms, and institutions with domestic ones (DeSombre 2000).

203 Top-down approaches have not only generated concerns about their effectiveness but also about global equity, as top-down treaties may reflect the preferences of the developed countries whose industrialization and development have fueled accelerated environmental degradation, to the exclusion of developing and emerging economies, many of which stand to face more of the negative consequences like rising temperatures, sea level rise, and resource scarcity (Escobar 2011; Baland and Platteau 1996.). In addition to developing countries feeling left behind, affected individuals and communities—those at the bottom of the global economic pyramid who are likely to experience environmental harms most directly—may not have their interests and concerns reflected very well in top-down policy discussions.

204 Although bottom-up approaches to environmental governance may ameliorate disadvantages of top-down approaches, when problems transcend a smaller scale, a bottom-up approach may simply not be up to the task (Keohane and Ostrom 1994). Furthermore, when governance is devolved to lower scales, a concern arises for a “race-to-the-bottom” effect, as local jurisdictions may have an incentive to compete for business activity through less stringent policy measures. A related concern is that jurisdictional or scale spillovers may occur; that is, as some localities or regions respond to environmental problems more aggressively, they may only find that they push more-polluting businesses to other jurisdictions with weaker policies, without fully solving the trans-boundary environmental problem (Wiener 2007). The extent to which these problems with bottom-up approaches manifest themselves, however, remains an open question, with some research offering counterexamples and theoretical reasons to question the significance of race-to-the-bottom effects (Vogel 2009; Revesz 1992).

### 205 **3.3.3 Policy Processes**

206 Choices about policy criteria, instruments, sector, and scale all implicate values and interests over which different individuals have different preferences and views. Understanding *how* these choices should be made has motivated the vast field of political science generally. Relevant issues for environmental policymaking include the level of transparency of policy decision-making and the type and extent of participation by affected parties, including the broader

public. Particularly relevant social science research has focused on the role of experts (Jasanoff 2009; Haas 1992), consensus-building (Coglianese 2003) and public participation (Tyler and Markell 2008; Fraser et al. 2006; Singleton 2000). The means by which policy decisions are implemented and enforced has also been subjected to extensive inquiry and fruitful illumination by social scientists (Ayres and Braithwaite 1995; Hawkins 1984; Bardach and Kagan 1982). Ultimately, the processes by which policy decisions are made and implemented provide the methods by which societies will find solutions to environmental problems.

### 207 **3.4 Conclusion**

208 In this paper, we have endeavored to illuminate some of the many intellectual contributions from social sciences to the understanding of environmental problems and to the design of effective policy solutions that will change individual and collective behavior in ways that enhance environmental quality. To solve environmental problems, governments, businesses and global civil society not only need sound natural scientific information but they must confront key normative or policy questions as well. The underlying causes of environmental problems can be conceptualized in relatively straightforward terms as a failure of individual actors to internalize externalities, but given the sheer number of actors, and the variety of activities they engage in, effectuating a meaningful internalization of environmental costs will often prove challenging and complex. Contriving effective solutions requires a nuanced understanding of the complex economic and social sources of human-induced problems, as well as sources of countervailing pressure because, most often, environmental harm occurs from people acting in ways that are privately rational but collectively suboptimal. Those individuals and businesses currently imposing spillovers on others can be expected to resist efforts that would force them to internalize those costs, and if they generally possess greater resources or are better organized than environmental cost-bearers, the distribution of environmental amenities may tend to mirror that of other resources. An awareness that environmental harms are not evenly distributed, whether in individual societies or around the world, reinforces the relevance of finding ways to ensure a more complete elaboration of environmental policy's impacts and a search for still better ways improving the well-being of all members of society. Social science's longstanding interest in collective decision-making not only illuminates the causes of environmental problems but helps identify the tools and processes needed to solve them more optimally and fairly.

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## 4. The contributions of social sciences to health and safety

### 4.1 Introduction

In the earlier history of medicine and public health, statisticians and epidemiologists have had a well-documented and prominent role (Ackerknecht 1982). In the 20th century, demography, social epidemiology, economics, and political science increasingly contributed to the improvement of population health.

One of the early pioneers in this history of health improvement was the physician and epidemiologist John Snow who contributed to a better understanding of a cholera outbreak in London in 1854. By mapping cases and using statistical methods he was able to identify a water pump in Broad Street as the most likely source of the recent outbreak. With this evidence in hand, he was able to convince local authorities to implement a simple measure that led to the control of the epidemic: removal of the handle to the water pump (Porter 1991).<sup>[9]</sup>

Public health policies to improve health and safety are not always this simple; other contributions included vaccinations, better housing and better hygiene, reduction of poverty, and improved surgical techniques and anesthesia. The 20th-century public health achievements include widespread immunization and control of infectious diseases, workplace safety, safer births, contraception and family planning, fluoridation of drinking water, safer and healthier food, motor-vehicle safety measures, tobacco control and taxations, and prevention and treatment of heart disease and stroke. The rise and fall of tobacco-related deaths documented by Doll and Peto should especially be mentioned here (Doll 1994, Peto, Lopez et al. 2016). Finally, health systems started to develop, first with social health insurance for the few, later expanding to universal health coverage in country after country throughout the century. The establishment of the NHS in 1948 was one milestone, the Affordable Care Act in 2010 another long overdue achievement. Yet, more than 50 countries fail to offer true universal health coverage (UHC), leading the World Health Organization in 2010 to advocate for UHC worldwide and to declare in 2012 that UHC is the single most powerful concept that public health has to offer (WHO 2010). In 2015, all countries in the world signed on to Sustainable Development Goal 3 (Health and Wellbeing) where UHC is an important sub-target (Summers and on behalf of 267 signatories 2015, UN 2015).

214 Medical knowledge, medicine, technology, and improvements in living standards undoubtedly contributed to the rapid improvements in health and longevity we have witnessed the last half century. This story is convincingly told in Angus Deaton's book "The Great Escape: Health, Wealth, and the Origins of Inequality" (Deaton 2013). However, the contributions of the social sciences – such as statistics, demography, social epidemiology, economics, and political science – to health and safety is perhaps less well known and documented. Modern medicine and health policy are unique in the sense that they are evidence-based, or at least evidence-informed. This reliance on science made possible the influence of the social sciences and the interaction between disciplines. There are have also been large inequalities in health and longevity, and the social sciences have much to offer in terms of diagnosing the challenges, identifying gaps in knowledge, producing relevant new evidence, providing critical perspectives, and suggesting improved health policies on the path to social progress in health and health care.

215 The following sections offer a brief sketch of some contributions from the social sciences to better understand changes and propose improvements in health and safety.

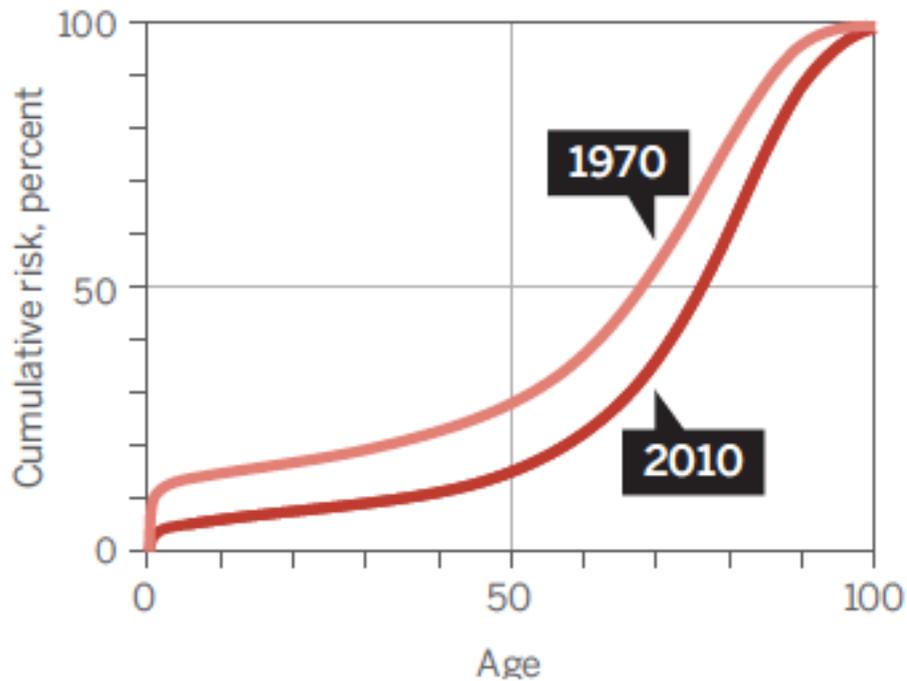
#### 216 **4.2 Improved Life Expectancy and Reduced Mortality**

217 The story of social progress in health is, unlike in many other sectors, predominantly positive. The world has seen a remarkable improvement in life expectancy at birth, from on average 48 years for both sexes in 1955 to above 71 years in 2015 ((United Nations Population Division 2015), see also chapter 18). This is an increase of 23 years over a time span of 60 years, or put differently: more than 4 months of increase per year. By taking also chronic disease and morbidity into account, healthy life expectancy at birth (HALE) is measured by a more recently developed summary measure of population health. As part of the Global Burden of Disease study, Salomon et al found that in 1990, male global healthy life expectancy at birth was 55 years and for females 59, while in 2015 male healthy life expectancy increased to 61 years and for females to 65 years (GBD 2015 DALYs and HALE Collaborators 2016).

218 Another way to look at progress in health is by age-specific mortality. World-wide cumulative risk of death before the age of 50 years almost halved between 1970 and 2010 (from 28% to 15%, see Figure 1) [9].

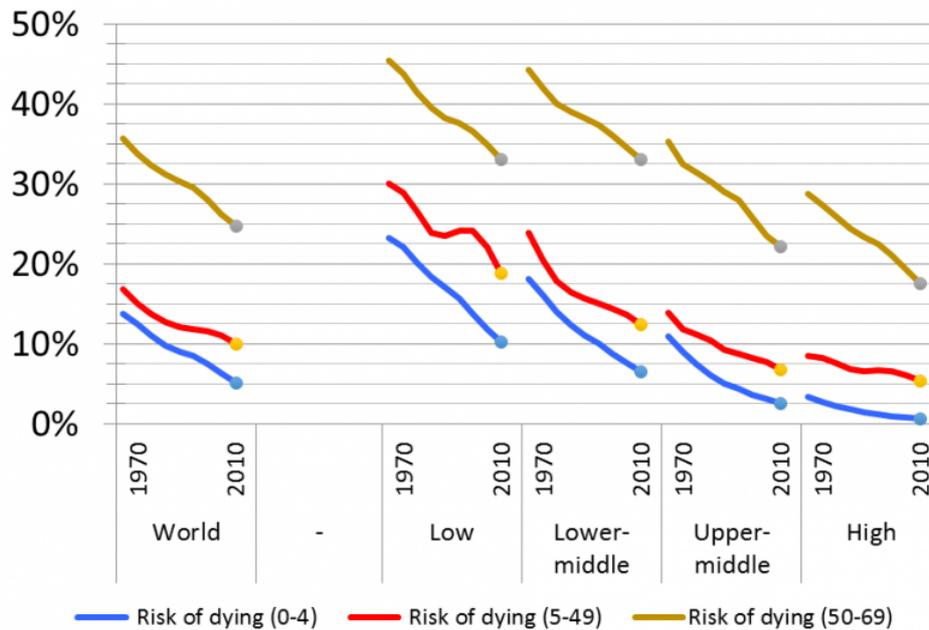
## World mortality, 1970 and 2010

Decreasing risk of premature death



220 *Figure 1 Risk of premature death, World, 1970 and 2010 (source: [9]).*

221 The risk of premature death (before age 70 years) has decreased substantially worldwide and for all World Bank income groupings of countries (Figure 2). Globally, the risk fell by a third (54% to 36%) [10]. If we look at cumulative risk of death in the age groups 0 to 4, we see that the absolute reduction was largest for low-income countries (with highest initial mortality), while the relative reduction was more rapid for the highest income countries (with lowest initial mortality).



223 *Figure 2: Risk of dying in selected age ranges for the world and four World Bank income groupings of countries 1970-2010 (Source: [10]).*

224 Similar positive reductions are seen for all the other age groups represented in Figure 2, except some increase in mortality for the age range 5-49 years in low-income countries due to the HIV/AIDS epidemic. These changes in age-specific mortality explain the rapid improvement of life expectancy almost all over the world.

### 225 4.3 Inequalities in Health

226 Average life expectancy or healthy life expectancy is not the only measure of population health that matters; the distribution around this average is also important. According to the UN Population Division (2015 revision), estimated life expectancy at birth for both sexes for the period 2010-15 in low-income countries was 60.3, in lower-middle income countries it was 66.3, in upper-middle income countries 73.8 and in high-income countries 78.8 years (United Nations Population Division 2015). The gap between the worst performing country (Swaziland, 49.2 years) and the best performing country (Japan, 83.3) was 34.1 years. Although these inequalities have declined during the last decades, large inequalities in life expectancy between countries remain.

227 In addition to looking at between-country inequalities in life expectancy at birth, it is also possible to measure within-country inequality in premature death (Le Grand 1989, Anand and Nanthikesan 2001). One group of demographers have developed an overall measure of health inequality called life disparity (Vaupel and Canudas Romo 2003). Life disparity is a measure of how much lifespans differ among *individuals* and is calculated from life tables (the same data as life expectancy is estimated from) (Vaupel, Zhang

et al. 2011). Vaupel et al found that there are still substantial inequalities in life disparity, but that they have decreased substantially. Increases in life expectancy are highly correlated with decreases in overall inequality in life disparity, and this study concludes that: “Greater longevity and greater equality of individuals’ lifespans are not incompatible goals. Countries can achieve both by reducing premature deaths.” (Vaupel, Zhang et al. 2011). The overall picture, in terms of improvements and reduction of inequalities in longevity, is therefore one of clear social progress, although the best-off improved faster than the worse-off countries.

228 Yet, the picture should be further nuanced. Social epidemiologists, such as Michael Marmot and others, are less concerned about overall health inequalities, and more concerned about social *group* inequalities in health (Marmot 2013). Social justice should worry about whether unfairly distributed social determinants of health – such as social status, income and level of education – translate into unequal and unfair health outcomes. These *inequities* in health, defined as *unfair and avoidable inequalities* in health, are now well documented, from the first Whitehall studies in London (Marmot, Stansfeld et al. 1991), to the World Health Organization’s 2008 global report “Closing the gap in a generation” (World Health Organization 2008), to studies of inequality in life expectancy by social groups in the US. In the US, the gap in life expectancy between the richest 1% and poorest 1% of individuals was 14.6 years (Chetty, Stepner et al. 2016). In the UK, differences in life expectancy between neighborhoods with high and low incomes have been found to be around 10 years (Marmot, Allen et al. 2010). In many countries, *relative* social group inequities in age-specific mortality are increasing (Marmot 2015). While most people live longer and better lives, the rate of change is faster among the well-off compared to the worst-off (as documented e.g. in the US (Chetty, Stepner et al. 2016)).

#### 229 4.4 Disease and Poverty

230 In addition to inequalities in health outcomes, social group inequalities in access to health services are also well-documented, and especially so in low-income countries through Demographic Health Surveys and Multiple Indicator Cluster Surveys [21]. For example, Cecar Victora et al provide a useful overview of inequalities in access to maternal and child health services, or service coverage, in 35 low- and middle-income countries [22]. This study found prevalent pro-rich inequalities in coverage, but with average coverage increasing for most indicators, and inequalities by socioeconomic quintiles decreasing.

231 Impoverishment from disease and out-of-pocket expenditures for health services has also been documented (Xu, Evans et al. 2003, Wagstaff 2010). The World Health Report of 2010 found that direct out-of-pocket payments represented more than 50% of total health expenditures in 2007 in the worst performing 33 countries (WHO 2010). Often, individuals and households resort to a variety of strategies to cope with illness-related bills, such as borrowing money from peers or selling assets (Kruk, Goldmann et al. 2009). Without pre-existing financing arrangements, like social health insurance, household medical expenditures can sometimes be “catastrophic” – defined as exceeding a certain fraction (e.g. 10-40%) of total household expenditures (Xu, Evans et al. 2003).

233 The threat from climate change on health, especially for the global poor, should also be mentioned. Tackling climate change could be the greatest global health opportunity of the 21st century [27].

235 Summing up so far, people all over the world are living longer and better lives on average, inequalities around these averages are decreasing substantially, while some countries and social groups within each country are falling behind. Lack of universal public finance of health systems also pushes people into poverty or catastrophic health expenditures. Many countries have achieved universal health coverage, but for those who have not, health care financing reform is today seen as the strongest concept public health has to offer to improve health and protect against health-related poverty (Chan 2016). The threat from climate change is another challenge. With existing effective medical technologies, we have enough knowledge to vastly improve global health, yet the health systems, their organization and their financing leave much to be improved. This is where social science can contribute to health and safety. Countries not only need doctors and nurses; health policy today is increasingly being developed by insights from demographers, economists, social epidemiologists, statisticians, and political scientists.

#### 236 **4.5 The Role of Markets and the State**

237 Most developed countries, and all OECD countries now have universal health coverage [4]. The level of care varies, and health systems are organized and financed in different ways, but common to all countries is that they provide essential health services to all citizens free of charge or with relatively small co-payments [28]. Financing of services comes from pooled resources; either financed through tax revenue and in some cases “sin-taxes,” as in single payer systems such as the NHS in the UK, or through compulsory health insurance as in Germany, the Netherlands or the USA. Many of these countries also have private health insurance and private providers of

services, but payment for services comes primarily from pooled resources. If direct out-of-pocket health expenditures exceed 20-30% of total health expenditures, countries will hardly qualify as having universal health coverage [4].

- 238 It is important to note that universal health coverage systems are fundamentally meant to be redistributive (although the degree may vary). Prepayment mechanisms have the potential to address many of the shortcomings associated with out-of-pocket payments, thus promoting both access to services and financial risk protection. This is primarily because such mechanisms allow for pooling of funds and consequently pooling of risk. The pooling of prepayments can take place in different settings, for example, in private and social insurance schemes, but prepayments are mandatory. Evidence at all national income levels shows that mandatory contribution mechanisms (taxation or mandatory social health insurance) are more efficient than voluntary mechanisms [4, 29]. This is particularly because voluntary mechanisms are vulnerable to the problem of “adverse selection,” whereby relatively “high-risk” elderly and sick individuals are more likely to join the pooled scheme than relatively “low-risk” young and healthy individuals [30]. UHC will normally require a degree of financial subsidy not only from the better-off to the worse-off but also from the young and healthy toward the elderly and ill [31].
- 239 Thus, the state has a fundamental role in securing universal health coverage, even in systems with mixed private and public financing and service provision. This view is now fairly well established (although still a matter of debate in some parts of academia) and in 2005, all member states of WHO endorsed UHC as a central goal [32]. In 2012, the United Nations General Assembly adopted a resolution emphasizing the responsibility of governments to “urgently and significantly scale up efforts to accelerate the transition towards universal access to affordable and quality health-care services.”[33]
- 240 This emerging consensus is supported by two fundamentally different arguments from the social sciences that both reinforce each other. The first is an economic argument about failure in health insurance markets; the second is an argument from political theory about the moral right to health and health care.
- 241 In a seminal paper, the economist Kenneth Arrow demonstrated how health insurance behaves differently from other goods normally distributed in the market (Arrow 1963). This argument has now become widely accepted, with some variations, in standard textbooks in health economics. The market for health services involves three principal actors, the patient, the doctor, and third

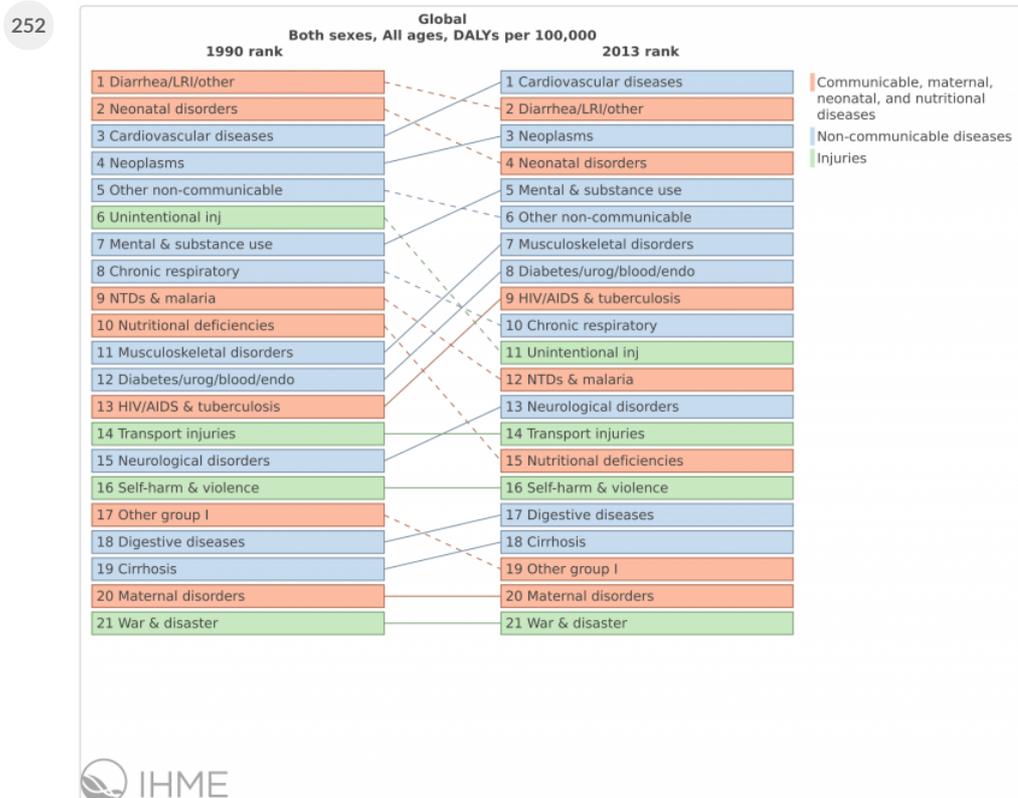
party payers. Three factors – moral hazard, decisions under conditions of uncertainty, and asymmetrical information between the actors – are likely to cause market failure in the health insurance market. Voluntary health insurance will lead to adverse selection so that the young and healthy would get lower premiums and those with pre-existing conditions or the elderly at higher risk will be excluded or get higher premiums. In the absence of collective risk-pooling, premiums for low-risk patients will remain low, while premiums for those who really need health care will increase to the point where market failure and inefficiencies will occur. The state must, therefore, regulate this market and make risk pooling mandatory. The upshot is that medical need should determine health benefits, not risk or ability to pay.

- 242 The argument for a moral right to health and health services arrives at the same conclusion, that access to health services should be allocated according to need and not ability to pay, but from a different direction. The arguments have been presented by many, but perhaps most effectively from political theorists in the social justice tradition such as Norman Daniels and Amartya Sen. Building on the work of John Rawls, but extending his theory, Daniels has argued that health and health care are special goods and that normal health is a necessary, if not sufficient condition for citizens to achieve fair equality of opportunity to develop and fulfill a rational life plan. Citizens, therefore, have a moral right to health and insofar health services contribute to fair equality of opportunity, a right to health care (Daniels 1985). For Sen, good health and avoidance of premature mortality are key human capabilities that everyone has reason to want and are hence fundamental for achieving freedom. Health has both intrinsic and instrumental value:
- 243 Any conception of social justice that accepts the need for a fair distribution as well as efficient formation of human capabilities cannot ignore the role of health in human life and the opportunities that persons, respectively, have to achieve good health – free from escapable illness, avoidable afflictions and premature mortality. (Sen 2002).
- 244 For both, it should be noted, the importance of health equity does not only justify a right to health care, but includes also a concern for fair distribution of the social determinants of health. Their definitions of fairness also include fair process (Sen 2002, Daniels and Sabin 2008, Sen 2009). Health is an important element of fair equality of opportunities and freedoms, and if the market fails to distribute health fairly, social justice requires that society's basic institutions and their governance contribute to that goal.

- 246 Previous sections have already discussed major findings by demographers and statisticians; their analytic tools, such as life tables, are used for the estimation of life expectancy and inequalities in mortality. Two other important contributions demonstrate how they have helped to shape health policies towards social progress.
- 247 According to the UN Population Division's 2015 medium estimate of population growth, the world population is estimated to grow to 8.5 billion people in 2030, and to 9.7 billion people in the year 2050 [7]. Especially in sub-Saharan Africa, fertility rates are still very high; the average woman has more than five children over her lifetime [37]. Fertility can be reduced by two types of policies. First, by female education and providing access to modern contraceptives. Second, all the evidence demonstrates that reduced child mortality is followed by reduced fertility rates [37, 38]. This insight has been influential in shaping global health policies.
- 248 The demographic dividend is another key concept of high relevance for national health policy [39]. Countries with a high rate of working to dependent populations (children and the elderly) can benefit from the demographic dividend. Countries with a high proportion of children will, after they experience falling fertility rates, see a demographic shift with a higher proportion of people in their working age and still a low proportion of elderly people. If countries invested well in health care for their children, and education and employment opportunities for the young, there is a window of opportunity for harnessing the benefits of the demographic dividend. This positive development can be hampered or missed with inappropriate policies. Poverty and income affect health, but investing wisely in health can also affect income, growth and prosperity [40].
- 249 In the last twenty-five years, the contributions from economists have been substantial, not only through the World Bank and IMF's influence on cutting public expenditures that was deeply felt in the health sector of low-income countries in the 1990s, leading to increased reliance on user-fees and in some countries deteriorating health systems, but also the shaping of health reforms such as experiments on quasi-markets in the British NHS, New Zealand and other countries in the early 1990s. But economists have also made some remarkable and constructive contributions to health.
- 250 In a famous interview in *The New Yorker*, Bill Gates told the story of what influenced him the most when deciding on how to spend his wealth when moving into philanthropy (Specter 2005). It was a small report from the World Bank called "Investing in health" (World Bank 1993), commissioned by chief economist Larry Summer and written by a team that included a young doctor and health economists Chris

Murray, and with the economist Dean Jamison as senior lead author. This small report has been hugely influential, also beyond the Gates Foundation, perhaps because it tried to answer three questions of great concern for global and national health policies: 1) How can the burden of disease in a country and in the world be measured? 2) Why should finance ministers invest in the health sector? and 3) How should the resources within the sector be allocated?

251 The burden of disease can be measured by disability-adjusted life years lost (DALYs), the report suggested, measured against a norm defined by what the best performing country at that time, Japan, had achieved. The DALY does not only capture life years lost from disease, but also morbidity such as living with depression or a lost limb. Today, the Global Burden of Disease Project has become one of the key starting points for nearly all discussions of health policy [43]: which conditions and risk factors are associated with the largest disease burden (Figure 3)?



253 Figure 3. Conditions associated with DALYs lost, global, both sexes, 1990-2013. Source: [43])

254 We see from Figure 3 that in 1990, the top three global causes of DALYs lost were diarrhea, pneumonia, and other infectious diseases, followed by neonatal disorders and cardiovascular diseases. In 2013, due to both reduced mortality and demographic changes, cardiovascular disease and cancer are among the top three. We are witnessing a demographic shift, followed by an epidemiological transition towards more non-communicable diseases.

- 255 Second, the report provided a convincing analysis that investing in health could yield substantial economic returns. Health care is not only an expenditure for the ministries of finance. If resources are invested wisely, the population can live longer and more productive lives. Healthy children learn better, malaria prevention reduces absenteeism and increases productivity, and public finance protects against catastrophic health expenditures.
- 256 Third, resource allocation within the health sector should aim at health maximization, the report suggested, and the tool to identify which interventions and policies to invest in is cost-effectiveness analysis. By modeling the cost per DALY averted, the most efficient ranking of services can be determined. The report also proposed that countries should invest in an essential package of public health interventions and a package of essential clinical services that would yield the maximum health benefit.
- 257 In 2013, twenty years later, Larry Summers and Dean Jamison were asked to revisit the analysis and formed the Lancet Commission on Investing in Health. Their report, *Global Health 2035*, had four conclusions that are relevant for social progress (Jamison, Summers et al. 2013). First, a “grand convergence” in mortality associated with reproductive, child, maternal, and infectious conditions is achievable by 2035. Second, the returns to investing in health are even greater than originally estimated. By using the full-income account and by combining demographic estimates of increasing life expectancy with the value of a statistics life (Hammitt and Robinson 2011), converted to the value of additional life years, they estimated that for every dollar invested in essential interventions for child, maternal, and infectious conditions, the economic benefits are 9-20 times higher. Third, they proposed a package of essential interventions of cost-effective clinical interventions for NCDs and injuries, as well as public policy instruments such as increasing taxes on tobacco and alcohol and reducing subsidies on items such as fossil fuels (which produce air pollutants that cause NCDs). For example, a 50% tax on tobacco would prevent 20 million deaths in China and generate US \$20 billion additional revenue annually. Finally, the Commission recommended “*progressive universalism*” as an efficient way to achieve health and financial protection. Progressive universalism means that UHC should first protect everyone by covering essential health-care interventions, and later a broader package can be offered (funded through a wider range of financing mechanisms).

258 **4.7 Distributive Issues and Governance for Better Health and Safety**

- 259 The contributions from demographers, social epidemiologists, and economists have been supplemented by philosophers and human rights advocates trained in the traditions of political theory. Building on a good understanding of what is known about the major trends in health and its distribution, a key issue is how to allocate scarce resources for health services in a fair and efficient way. While the WHO and the World Bank had earlier championed cost-effectiveness as a key criterion for global and national resource allocation (World Bank 1993, WHO 2012), philosophers and others in the social justice tradition have argued that this approach is insensitive to the distributional aspects of priority setting (Williams 1997, Nord 1999, Brock 2001, Sen 2002, Brock and Wikler 2006, Daniels 2008, Norheim 2016). Health policy needs to go beyond cost-effectiveness, and set priorities also with respect to the worse-off (in terms of health and poverty) and to financial risk protection (WHO 2014).
- 261 Some even argue that all substantive criteria for priority setting, and especially cost-effectiveness, are so contested that they should be replaced by a fair and legitimate process [54]. Others hold that both process and substantive judgments are important [51]. “Accountability for Reasonableness” is one widely accepted framework that sets out conditions for a legitimate priority setting process [55]. The core idea is that governments or other providers should make explicit the range of services they offer, and that reasons for inclusion or exclusion are made transparent to all affected parties. A fair process is inclusive and has broad stakeholder involvement and mechanisms for critical assessment and revision. The process itself should be institutionalized. If satisfied, these conditions can connect decisions about priority setting to broader democratic processes [47].
- 262 The broader democratic processes include better governance for health. Fair progress requires tough policy decisions. Governance can be facilitated by robust public accountability and participation mechanisms. Accountability involves answerability and enforceability [56]. Individuals and institutions that are held accountable must provide information about their decisions and actions, justify them, and face some type of sanctions in the event of misconduct. The public’s role is to actively hold the relevant actors accountable.
- 263 Public participation is the practice of involving members of the public in the agenda-setting, decision-making, and policy-forming activities of institutions responsible for policy development [57]. True public participation involves interaction and dialogue. Public accountability and participation can each take numerous forms [57-63]. Governments and other relevant institutions can be held

accountable for ensuring that proper participatory processes are in place [64, 65]. Although there are numerous calls for better governance in health, few countries have really succeeded in going beyond technocratic approaches to inclusive health policy development. The “political determinants” of health, barriers to global governance such as power structures and unfair trade agreements, can also hamper social progress [66].

265 Better results have been achieved in the area of monitoring and evaluation. A strong system for monitoring and evaluation is also needed to promote accountability and participation. Several monitoring systems were put in place for the MDGs for health [67, 68], financial accountability can be improved through National Health Accounts [69], the Global Burden of Disease is and will be a good source for data monitoring progress towards the SDG for health [70], and the UN system, together with the World Bank are working on new monitoring frameworks for health [71]. Countries must follow up and improve their national monitoring systems.

#### 267 **4.8 Lessons learned**

268 As mentioned above, modern medicine and health policy are unique in the sense that they are evidence-based, or at least evidence-informed. Although economic growth and better living standards have substantially improved health, making use of evidence – also from the social sciences – may also have contributed. There has been a clear demand for evidence from the policy arena, and this has enabled legal regulation, pooled resource financing, active governmental agencies, and insurance companies to draw on knowledge, assessments and proposals for policies from the different social science disciplines.

#### 269 **4.9 Conclusion**

270 Demographers have documented substantial improvements in life expectancy and reductions of inequality in longevity, although some countries and social groups within each country are falling behind. The threat from climate change on health, especially for the global poor, could be a challenge for further reductions in health inequality. Resilient health systems may be part of the answer. Global public finance of progressive universal health coverage is justified both on economic and ethical grounds, and both economists and ethicists agree that fair and efficient resource allocation is inevitable to achieve this goal. So is, as political scientists have reminded us, fair process and better governance.

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## 5. Social science and the development policymaking discourse

For the past forty years, the field of economic development has been dominated by the intellectual hegemony of the “Washington Consensus” paradigm – first in a narrower, and then in an expanded version.<sup>[10]</sup> The broader political and social drivers of this hegemony were the loss of credibility of central planning as a mode of economic organization; the success of pro-market political movements (with Thatcherism and Reaganism as early examples and, later, the extraordinary economic success of ‘Dengism’ in China); the fall of the Soviet Union; and the ‘third wave’ of democratization of the 1990s. An added driver has been the central role, over the past half century, of the World Bank, the International Monetary Fund and some other official multilateral and bilateral institutions in shaping both development thinking and practice; this dual role provided sustained, ongoing momentum for translating the Washington Consensus paradigm into an agenda for action. Riding these waves of history, neoclassical economics, and democratic constitutionalism became the dominant frameworks for development scholars and practitioners alike.

But the trouble with intellectual hegemony is that it airbrushes out complexity. In contrast to the Washington Consensus, an alternative view <sup>[11]</sup> is that development gains come from engaging with developing countries’ messy realities, not from seeking to override them with blueprints of best practice. How has the tension played out in practice between those scholars and practitioners who embrace the dominant development paradigm, and those who contest some of its key tenets? Why? This paper explores these questions, using as illustrative cases the evolving discourses on industrial policy and on ‘good governance’.

### 5.1 Industrial Policy -- the Level Playing Field meets the East Asian Miracle

The Washington Consensus was unequivocal that the business environment most conducive to development was one which was ‘market friendly’ – that provided a ‘level playing field for private firms operating within competitive markets; moderate and uniform external tariffs; flexible markets, and light regulation. These elements became a staple of many of the World Bank’s structural adjustment programs.

- 276 There was, however, a problem. From the 1960s onwards, the stellar development performers were the East Asian tigers. And, as a growing literature explored in depth, the policies which they championed could not easily be reconciled with the nostrums of a 'level playing field'. [12]
- 277 Take the example of Korea. Between 1961 and 1987 Korea grew at an average real annual rate of over 6 percent per annum. In the early 1960s, over half the population lived below a minimum threshold of absolute poverty; by the mid-1990s, the proportion had fallen below 4 percent.[13] Contrary to the logic of 'market-friendliness', during this period, contrary to market-friendliness, the Korean government used top-down political levers to override markets and private decisions in highly-targeted discretionary ways.
- 278 At the heart of Korea's development success was the relationship between a dominant leader, General Park Chung Hee and the country's leading private firms, the '*chaebol*'. In a classic book written in the late 1970s, Leroy Jones and Sakong Il described the relationship as one of 'partial mutuality', where one actor (i.e. business) undertakes an action in order either to win goodwill, or to forestall an action by the other participant (i.e. government) which would inflict an even greater loss.[14] As they put it,
- 279 In Korea, the dominant partner is unequivocally the government....The success of government requires the success of business.....[but]..... the Korean government can ensure the failure of any businessman, should it care to do so ..."[15] Control over credit was the "fulcrum..... the knowledge that the government can cut off the credit tap at any time is sufficient for the operation of partial mutuality. The threat need only be carried out occasionally.[16]
- 280 The origin of Korea's world-beating shipbuilding industry offers an especially vivid example of how this worked:
- 281 One of the more impressive entrepreneurial feats in Korea was the creation of a world-class shipbuilding firm by Hyundai. .... International financiers and shipbuilder were not doubt bemused at the pretensions of someone soliciting funds with little more to show than a picture of a lovely sandy beach where the proposed Hyundai dry dock was to be built.... Hyundai Chairman Chong persevered only because of the urgings of President Park [who encouraged him by saying 'if you only want to do what is easy you'll get no help from me.....].
- 282 Among champions of a market-friendly world view, one initial response was to try and reframe the East Asian approaches in ways that minimized the inconsistencies with 'level playing field' nostrums

by emphasizing the widely accepted conventional neoclassical economics distinctions between private and public goods, and the role of government in addressing the latter.[17] Gradually, though, the paradigm seemed to move.

283 In 1994, the World Bank issued a widely read report on *The East Asian Miracle*. For all its limitations (highlighted by Wade, 1996), the report went further than the organization had previously gone in coming to grips with the reality that the successes of at least some East Asian countries policies were attributable, in part, to the ways in which they overrode markets. At the time, *The East Asian Miracle* seemed to be a landmark – an illustration of the power of sustained efforts on the part of social scientists to bring evidence to bear in a way capable of moving a dominant paradigm. But that was not the end of the story.

284 In 1997, a financial crisis engulfed Korea along with other East Asian economies. The crisis brought to the light of day corrupt self-dealing among Korea's *chaebol*, its banks, politicians and public officials – thereby exposing a downside of discretionary policies. As it happened, the Korean economy turned around very rapidly, continuing its rapid growth. But the damage had been done.

285 Over the subsequent decade, the discourse surrounding pro-active industrial policy largely disappeared from the mainstream development discourse. The 'market-friendly' paradigm enjoyed a renewed reign. The flagship product became the World Bank's Doing Business indicators.[18] Introduced in 2003, these globally comparable measures redirected attention to regulatory rigidities and market-friendly regulatory reforms as the way of accelerating private sector development. Though often criticized,[19] since their introduction these indicators have taken center stage in dialogue on private sector development between donors and development policymakers.

286 In the wake of the global financial crisis of 2008 (and the appointment of Chinese economist, Justin Lin, as Chief Economist of the World Bank) some revisionist thinking vis-à-vis market-friendliness began to resurface. But to those familiar with the earlier round of the discourse, there was a sad sense of *deja-vu* – with the contestation of ideas starting at almost the same place as in the earlier round, with no ground won from earlier battles.

## 287 5.2 “Good Governance is Necessary for Development”

288 Even as the effort to contest the dominant paradigm of a 'level playing field' was contained, a broader wave of change swept through the development discourse. During the Cold War era, the discourse

surrounding aid was framed exclusively in economic terms – the combination of money, good technical advice, and evident goodwill would provide a sufficient platform for development. Failures in the ways in which governments used aid were not to be spoken about directly. With the fall of the Berlin wall, these strictures were eased, and governance became part of the discourse.

- 289 The intellectual ground for such a shift seemingly had been well laid, not only among political economists (who had long focused on structural variables) but within mainstream economic thought. Going back to the 1970s and earlier, there had been a major revival of work on the institutional and political underpinnings of development. Major contributors to the ‘new institutional economics’ included five Nobel-prize winners: Douglass North, Elinor Ostrom, Herbert Simon, Ronald Coase, and Oliver Williamson.<sup>[20]</sup> A variety of scholars built on the insights of the new institutional economists to explore how institutions, politics, and economic policy interacted with one another.<sup>[21]</sup> But these contributions generally took a long-run view. The challenge for practitioners was to translate these insights into practical programs of action.
- 290 Three distinct approaches vied for supremacy. The first two fitted comfortably with prevailing currents of thinking in the Western development and aid communities. The third, as it turned out, less so.
- 291 The approach that posed the least threat to established ways of doing things was a focus on ‘building state capacity’ through training, reform of organizational systems and the like. But intellectually it was the least defensible. As the World Bank’s 2004 World Development Report put it: “If organizational failures are the result of deeper weaknesses in institutional arrangements (weak political commitment, unclear objectives, no enforceability), direct attacks on the proximate determinants will fail.”<sup>[22]</sup> Notwithstanding this conclusion, technocratic programs of capacity building continue to be widely supported by donors.<sup>[23]</sup>
- 292 The second approach was especially well-aligned with the tenor of the times in the aftermath of the Cold War. This approach comprised the embrace of the notion that good governance was necessary for development. In their widely-read book, *Why Nations Fail*, Daron Acemoglu and James Robinson argued (notwithstanding the ‘short-term’ realities of East Asian authoritarian development) that the historical evidence signaled that sustainable development needed democracy. As they put it:
- 293 It is the societies with inclusive institutions that have grown over the past 300 years and have become relatively rich today... Nations can take steps toward prosperity by transforming their institutions from

extractive to inclusive.... Authoritarian growth is neither desirable nor viable in the long-run, and thus should not receive the endorsement of the international community as a template for nations in LAC, Asia and Africa.... Attempting to engineer prosperity without confronting the root cause of the problems – extractive institutions and the politics that keeps them in place – is unlikely to bear fruit.[24]

294 The World Bank's 2004 World Development Report translated generalized advocacy of 'good governance' into a detailed set of micro-level prescriptions. Its point of departure was the logic of hierarchy – a logic in which 'principals' set goals to be implemented by 'agents', with the principal-agent relationships organized to assure alignment of the actions of the agents with the goals of the principals. The 2004 report laid out in detail the logic of a 'long route of accountability' -- an impersonal, institutionally robust chain of authority and delegation between successive 'principals' and 'agents' -- as the pathway for achieving development results. The long route of good governance generally incorporated the following:

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- An enabling environment that protects human rights, as well as rights to property, via the rule of law.
  - Political leaders who take hold of the reins of executive authority, and translate their general vision for the country into a strategy for action and allocation of public resources.
  - Capable bureaucracies, staffed with public officials committed to the achievement of social goals, with well-defined roles and responsibilities, and transparent and predictable decision-making -- plus robust internal arrangements for monitoring how effectively resources are used.
  - Front-line service providers (public, NGO or private) who take responsibility for delivering on these priorities.
  - Accountability of public officials and politicians to the citizens that they are intended to serve through electoral and other oversight arrangements – at national and local levels, and at the service-provision front-line.
  - Keeping corruption to a minimum – and, when it is discovered, meet it with the sanction of law.
  - Most broadly, assurance that the overall public order is broadly accepted as 'legitimate' by the vast majority of society.

296 The above translated seamlessly into an ambitious program of action which, especially in the aftermath of the Cold War, aligned well with prevailing conceptions of how politics and bureaucracies should be organized: foster democratic accountability; construct a clear division of labor between politicians responsible for goal-setting, and

bureaucracies responsible for implementation; build efficient bureaucracies along hierarchical lines codified in the early twentieth century by Max Weber (combined, some argued, with the more high-powered incentives for performance associated with the 'new public management'[25]); strengthen the justice system and other checks and balances institutions. Insofar as a chain is only as strong as its weakest link, simultaneous action was called for on multiple fronts.

297 Other researchers, however, drew very different implications from a long-run view of history than the nostrum that 'good governance is necessary for development' -- namely that weaknesses in formal governance institutions are part of the reality of underdevelopment, and that institutional improvements come slowly.[26] The development journey is not only one from low-income to high-income but from weak to progressively stronger institutions. As Douglass North, and co-authors John Wallis and Barry Weingast put it:

298 Societies do not jump directly from personal to impersonal relationships; rather, it is a long process... Transplanting institutions and policies cannot produce economic development. Indeed, to the extent that these institutions are forced onto societies by international or domestic pressure but do not conform to existing beliefs about economic, political, social and cultural systems, the new institutions are likely to work less well than the ones they replace. Worse, if these institutions undermine the political arrangements maintaining political stability, these new institutions may unleash disorder, making the society significantly worse off.[27]

299 Consistent with these latter insights, the third approach to integrating governance and development used the new openness to institutional analysis to call for 'politically smart', problem-driven approaches to development -- to explicitly incorporate political and institutional constraints into the design and implementation of development policies. There have been multiple contributions.[28] While they differ in their emphases, all share the following features:

- 300
- An insistence that the appropriate point of departure for engagement is the way things actually are on the ground -- not some normative vision of how they should be;
  - A focus on working to solve very specific development problems -- moving away from a preoccupation with longer-term reforms of broader systems and processes, where results are long in coming and hard to discern, and where the risks are high of altering only formal, de jure structures, with little effect on de facto realities; and

- An emphasis on ongoing learning – in recognition that no blueprint can adequately capture the complex reality of a specific setting, and thus that implementation must inevitably involve a process of iterative adaptation.

301 It would be nice to be able to report that scholarly input has been helpful in resolving the contestation among these distinct approaches. But, as of this writing, this has not happened. Instead, each continues to operate in its own parallel universe: on the one hand, a sweeping, triumphalist, bracingly straightforward, and (at least for some) ideological comfortable set of prescriptions; on the other, an embrace of messiness, historical contingency, and an ongoing search for ways forward across a variety of distinct contexts.

### 302 **5.3 What Accounts for these Patterns?**

303 The industrial policy and good governance discourses share a common pattern. In both, the discourse quickly (and in ways that were premature in light of the weight of evidence) locked into a dominant narrative which then turned out to be difficult to dislodge – even in the face of evidence to the contrary. The reasons for this are multiple -- some good; some less so.

304 The good reasons for this pattern of discourse can be summarized by the aphorism that ‘if you don’t know where you are going, you will never get there.’ ‘Good governance’ and a ‘level playing field business environment’ are normatively valued descriptors of how, at their best, high-income economies function. (Note, though, that a ‘level playing field’ need not imply limited regulation.) Viewed through such a lens, descriptions of ‘best practices’ thus function as guideposts for a journey -- supporting navigation in ways akin to the North Star, as useful points of reference, if only of limited relevance in addressing immediate challenges. (For many practitioners, a further strength of advocating this route is that it seemingly avoids some especially dangerous hazards of predation and capture, associated with discretionary policies of a kind that can be introduced under the cover of ‘East Asia Miracle’ style activism.)

305 But ‘best practice’ approaches can be abused. They risk locking-in narrow ways of seeing – a pre-occupation with technical (‘engineering’) conceptions to the neglect of more complex systems (‘evolutionary’) approaches to thinking of change as an adaptive process. If abused, they can be an invitation to arrogance – certainty as to what should be done, and judgementalism when things don’t work out as intended, rather than reflections as to the reasons why they did not.

- 306 'Best practices' thinking also privileges a role for global experts, their specialist skills, and their prescriptions. Moreover, much of this global expertise is housed within international organizations, which are constrained in their analyses and prescriptions by the political positions of their member countries. As noted in the introduction, these global experts and the international organizations within which they work are influential in shaping the development discourse. Insofar as they are resistant to change, this risks slowing the broader evolution of the development discourse in response to the accumulation of evidence.
- 307 In their suggestively titled book, *The Almost Revolution*, Tom Carothers and Diane de Gramont (2013) reviewed in detail the track record of efforts to introduce 'politically smart' approaches into the toolkit of development agencies. They concluded that:
- 308 Politically informed methods imply a whole set of operational characteristics – such as flexibility, open-endedness, toleration of uncertainty, labor intensiveness, significant investments in preparatory analysis, and devolution of control – that cut directly against many of the central imperatives and habits of mainstream aid organizations... The established edifice of institutional mindsets and mechanisms that control how aid is carried out has considerable staying power.... It tends to dilute what new methods are put in place, leading, for example to superficial political economy analyses or the reduction of bottom-up assistance into technocratic exercises that avoid core political obstacles.[29]
- 309 Perhaps even more fundamentally, both the 'market-friendly' and the 'good governance' discourses support a preoccupation with challenges of improving economic efficiency, moving to the back-burner concerns about the relationship between equity and development.[30] This affinity is obvious vis-à-vis 'market-friendliness'. But there is more to be said as to how the affinity plays out vis-à-vis 'good governance'.
- 310 At its surface, the good governance discourse is an uplifting one, an affirmation of the deepest values of the Western enlightenment. But, depending on how it is used, it could become a basis for opposing pro-active policies in a way that obscures any ideological preconception that might be at work. Evidence of complexity could be interpreted not as a reflection of the inevitable messiness of fostering change, but as the basis for a 'disappointed' conclusion that government failure is inevitable, so ambitious reforms should not be attempted. (Perhaps this was why 'good governance' was embraced so wholeheartedly by America's so-called neoconservatives.)

311 To be sure, governments can fail, sometimes disastrously so – and sometimes, indeed, by being destroyed from within by predatory kleptocrats. But there is a vast grey area between, at one end of the spectrum, idealized notions of good governance and, at the other, predatory kleptocracy. A pre-occupation with institutional reforms that foster ‘good governance’ risks shutting down the space between the extremes – and with it the encouragement to explore creative approaches through which government and society might address some of development’s knottiest challenges.

#### 312 **5.4 ‘Possibilism’ versus the Rhetoric of Intransigence**

313 Both of the examples considered in this paper describe a process in which a dominant paradigm takes hold, in a way that goes beyond the evidence, and then pushes back against efforts to add complexity, to soften the edges of certainty, to open up room for exploration. The forces that drive this process seem general – so the likelihood is high that it is likely to repeat itself well beyond the two examples that are the focus here, and be evident across a wide variety of areas of development discourse.

314 What broader lessons can we draw from this process as to how social science engages with the development discourse? Albert Hirschman, the great twentieth-century development economist, identified two distinct modes of engagement.

315 One mode is to reinforce the dominant paradigm with what Hirschman called “the rhetoric of intransigence.”<sup>[31]</sup> Insofar as the dominant paradigm contains more than an element of truth (indeed may reflect a central tendency along some important dimensions), research can provide a powerful buttress for the dominant views. Hirschman identifies three characteristic rhetorical devices that can be used to shut down space for contestation, and that can be implicit in programs of research: the ‘perversity thesis’ (wherein “any purposive action to improve some feature of the political, social or economic order only serves to exacerbate the condition one wishes to remedy”); the ‘futility thesis’ (wherein “attempts at social transformation will be unavailing...will fail to ‘make a dent’”); and the ‘jeopardy thesis’ (wherein “the proposed change endangers some previous, precious accomplishment”).<sup>[32]</sup> Much social science research over the past four decades (especially among neoclassically trained economists) has played this kind of role.

316 An alternative mode is in the spirit of what Hirschman described as ‘possibilism’:

- 317 Most social scientists conceive it as their exclusive task to discover and stress regularities, stable relationships, and uniform sequences. This is obviously an essential search... But there is a special room for the opposite type of endeavor.... To perceive an entirely new way of turning a historical corner....to widen the limits of what is or is perceived to be possible.... figuring out avenues of escape from exaggerated notions of absolute obstacles, imaginary dilemmas and one-way sequences...[33]
- 318 The two examples in this paper suggest that, for almost four decades, the first of Hirschman's two modes has held sway. To be sure, clarity can be bracing; arguably the Washington Consensus prescriptions have yielded substantial gains for global development. But the development (and global) challenges that increasingly are coming to the forefront are ones for which the 'rhetoric of intransigence' is unhelpful: fostering inclusive economies; facilitating collective action to provide public goods; protecting the collective commons. Perhaps coming decades will be a time for Hirschman's second mode of discourse, for "a more 'democracy-friendly kind of dialogue...to move public discourse beyond extreme, intransigent postures...with the hope that in the process...participants engage in meaningful discussion, ready to modify initially held opinions in the light of other arguments and new information." [34] Perhaps.....
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## 319 **6. Science, technology and innovation**

- 320 Implicit in the idea of social progress is the possibility of setting aside old arrangements that do not work and putting in their place something new and better. Innovation, therefore, can be seen as the starting motor of progress, the place where change for the good begins. Thoughtful observers of societal change have long noted that innovation does not always begin in the technical sphere. In his influential theory of the "cultural lag," the sociologist William Ogburn (1957, 171) noted that the variable precipitating a lag could be "technological, economic, political, ideological, or anything else." Ogburn's thinking on the subject went back to the 1920s. Yet, for hundreds of years, science and technology have retained a privileged position in common-sense understandings of the process of innovation—to the extent that, as observed by the anthropologist Andrew Barry (1999/2000), invention is usually taken to be synonymous with technical invention and society is most often seen as a source of inertia.

321 Basic indicators of social progress appear to confirm the conventional wisdom. During the Industrial Revolution and in the centuries after, new discoveries about nature's workings, translated into motors of industry and commerce, liberated human lives from the state that Thomas Hobbes (1996 [1651]) memorably decried as "solitary, poor, nasty, brutish and short." The long, pleasurable, and on the whole productive lives led by the more fortunate members of global societies today are often attributed to the technological breakthroughs of the past couple of hundred years: the steam engine, electrification, the internal combustion engine, antibiotics, pesticides, transistors, the contraceptive pill, the Green Revolution, genetic engineering, and personal computing. In all of these cases, innovation seems to have followed a linear trajectory, from a flash of scientific insight to transformative technological applications to products that reach and materially aid millions, even billions, of people.

322 Investigations of the practices of science and technology over the past fifty years, however, have complicated the linear model of innovation. First, the progression from idea to application to distribution and uptake is far from simple or smooth. In place of linearity, researchers have found more complex webs of interaction that require scientists and engineers to engage with and depend upon a wide variety of other social institutions and actors whose contributions also shape the courses of innovation. Second, socially beneficial innovations do not necessarily originate at the laboratory bench, and the implication that scientific knowledge is the only kind of knowledge that gives rise to progressive innovation has repeatedly been shown to be untenable. Third, from the standpoint of social progress, not all that is scientifically or technologically new has proved to be beneficial; nor, when there are competing technological solutions for a given problem, does the best option always win out in the marketplace. A homely example is the persistence of the QWERTY typewriter keyboard (David 1985), although that arrangement of letters does not maximize the speed or comfort of typing. Social analysis has illuminated some of the reasons for such suboptimal results, and ideas about how to make innovation more socially responsible have developed from that work. This section provides a brief overview of the relevant literature from science and technology studies (STS) on each of these points.

### 323 **6.1 Theorizing innovation**

324 STS research underscores the observation that, contrary to the premise of the linear model, even the most path-breaking scientific ideas do not remake society in and of themselves. Innovation takes work, and that work, in turn, involves a multiplicity of actors, institutions, materialities, and norms. But how do these elements

come together, why do some gain ground more easily than others, and how do the observed dynamics of making new sociotechnical arrangements intersect with classical social science theories about structure and agency? Furthermore, when do the synergies required to make innovations stick also lead to social progress as commonly understood? Three broad schools of thought may be discerned: those favoring agency, especially the roles of inventors, users, and civil society; those favoring structure, especially preestablished relations between states and markets; and those concerned with ways in which both structure and agency interact with the normative purposes of innovation.

325 These theoretical orientations map onto analysts' views of the dynamics of power. Those favoring the role of agency tend to focus on openings for bottom-up innovation, envisioning actors from outside the formal structures of power as having a significant influence on the courses of innovation. Structuralists, by contrast, see innovation as occurring mainly top-down, under the aegis of already authoritative institutions that make choices about how best to steer science and technology. Innovation then becomes an exercise, or a reassertion, of power by novel means. Interactionists for their part stress the interplay of structure and agency in the affirmation, through innovation, of background norms that can be analyzed and critiqued, and that foster, or on occasion hinder, progressive tendencies in society.

## 326 **6.2 Innovation from Below**

327 If there is one point on which analysts of technological innovation have converged over the past few decades, it is that innovation is a dispersed and multisite process, requiring the alignment of many actors, institutions, and work routines before it can change ways of life on a mass scale. The idea itself, as ethnographers have shown, grows out of "technoscientific imaginaries," or beliefs and commitments that contain more than just the germ of a breakthrough scientific idea (Marcus 1995; also MacKenzie 1998). Different scientific fields, moreover, have their own "epistemic cultures" (Knorr Cetina 1999), marked by distinctive relationships with co-workers and objects of investigation.

328 The Nobel Prize, the world's most prestigious award for scientific innovation, ostensibly acknowledges instances of individual brilliance. Thus, a single scientist, Kary Mullis, was recognized as the brain behind polymerase chain reaction (PCR), a technique that revolutionized modern biotechnology by enabling millions of copies of a string of genetic material to be made in a short period of time. Yet, as Paul Rabinow (1997) showed in his ethnographic study of the technique's "making," PCR became viable only through the marriage

of idea with practice, the latter engaging an entire cohort of actors, including private firms, none of whom shared the glory of the official scientific accolade. Furthermore, politics intervenes in the selection of winners, introducing subjective elements into the determination of which discoveries “confer the greatest benefit on mankind” (Friedman 2001). In other words, the reward structure of science reflects social and political presuppositions that influence the recognition and progress of discovery.

- 329 Actor-network theory (ANT) influentially generalizes from case-specific ethnographic studies of individual inventions to paint innovation as a process of building durable networks. Far from bringing entire worlds into alignment through the force of an idea, ANT depicts a process in which painstaking negotiation and struggle at every node of the network is the rule (Callon 1986). Only through such interactions do innovators achieve the translations that ensure the spread of ideas and practices throughout the network. ANT amplifies classical sociological accounts of innovation by casting non-human entities, or *actants*, as symmetrically engaged in the production of novelty. Analytically pathbreaking in that it expands the range of entities subject to sociological analysis, this move also carries important implications for social progress: it calls attention to the central, though unevenly distributed, role of material resources, such as venture capital and state-of-the-art biomaterials or lab instruments, in enabling the innovations that remake society.
- 330 Like older, more traditional theories of innovation, however, ANT still accords a position of crucial importance to the laboratory, not simply as a place of ideas but as the site where ideas and their material realizations most forcefully join together. Thus, the spread of a revolutionary public health technique, the pasteurization of milk, occurred in Bruno Latour’s well-known telling because Pasteur was able to bring the microbes into his laboratory, discipline them, and engineer their transformation into a vaccine that won wide social acceptance (Latour 1988). The lab, in this analysis, was the locus of innovation that allowed disparate actors, including microbes, cattle, and dairy farmers, to be enrolled into a new understanding of how to cure an old problem.
- 331 Implicitly, in many ANT accounts, the scientific and technological actors responsible for putting together the networks of innovation also determine which inventions are most worth pursuing. But the network exercises a force of its own. A sometimes neglected dimension of inventing from below, or perhaps more accurately from the side, is the work done by members of a technological workforce, usually seen as mere cogs in the system of production. Engineering innovation is rarely a product of an individual actor’s scientific inspiration, but rather of sustained team work in hospitable

circumstances, as at the historic Bell Labs, the cradle of many breakthrough technologies grounded in the physical sciences (Narayanamuriti and Odumosu 2016). Medical innovation may begin with the discovery of an active molecule, but it is carried forward by physicians who observe and direct their use in patients. New lines of treatment may emerge from off-license prescription by physicians or by patients themselves who discover unexpected benefits from using licensed drugs for unlicensed purposes. Technology transfer can become a further motor of innovation if the design of the original systems and devices is “fluid” enough for receiving societies to adapt them for local use (de Laet and Law 2000).

332 The work of translation may, as ANT analysts have pointed out, redirect the imagination of technical innovators so as to alter their perception of society’s needs and, consequently, their own research priorities. Interaction with patient groups, for example, transformed how French clinical researchers thought about what was needed to treat cystic fibrosis (Rabeharisoa and Callon 2004). More generally, patient activists with rare genetic diseases are credited with placing their concerns on the research agenda through strategic enrollment of scientists and even companies, reversing the conventionally presumed direction of innovation from science to capital to society (Stockdale and Terry 2002). In turn, by engaging in new modes of social action, social actors may sort themselves into groupings that become interactive, in the sense proposed by Ian Hacking (1999). For example, as genetic knowledge has advanced, humans’ new self-understanding of themselves as genetic beings has begun to loop back and inform, indeed activate, new modes of “biological citizenship” (Rose 2007), with citizens assuming more active responsibility for their own health.

333 A partly contrasting view of the sociology of innovation has emerged from scholars who see technological systems as constructed not only by the supply of ideas and techniques but also and equally by the demand side of technology’s perennial supply-demand dynamic (Bijker et al. 1987; Bijker 1997). Focusing on the preferences of “users,” or more generally “concerned social groups,” proponents of the social construction of technological systems (SCOT) stress the ways in which design choices emerge not simply from the minds of inventors and innovators but in constant interaction with the needs and wishes of those who make use of the novelties that scientists and engineers produce. Like ANT researchers, SCOT adherents recognize that actor categories themselves do not remain constant throughout the course of innovation (Oudshoorn and Pinch 2003). Preferences may shift as products acquire new characteristics, partly in response to disaffected potential customers who demand design changes. Indeed, users can powerfully shape technology by resisting it, whether the mechanical looms of the eighteenth century that the

Luddites broke or, closer to now, such contested technologies as childhood vaccines, genetically modified (GM) crops, and forms of social media.

### 334 6.3 Innovation from Above

335 Structuralist accounts of innovation have tended to come in the first instance from historians and sociologists concerned with alliances between capital and government to promote particular forms of innovation. The state-supported “military-industrial complex” (so called by US President Dwight D. Eisenhower) has been a major source of innovation, consuming vast amounts of public resources while pursuing a “secluded science” (Callon et al. 2009), largely shielded from public attention and contemporaneous scholarly critique. The pervasive influence of military spending on the nature of scientific activity emerges as a consistent theme from this literature (Edgerton 2006; Oreskes and Krige 2014). Scientists themselves function to some degree as a “reserve labor force” (Mukerji 1989), their research supported with public funds so long as they remain available, like the physicists of the Manhattan Project, to be called to service in times of national need. In the computer age, state ambitions of prediction and control have shaped the discourses of science and technology and influenced the subjectivity of scientists engaged in statist projects (Edwards 1996). State interests in having functional military machines affect the design of the artifacts themselves, so that features such as a weapon’s accuracy can be seen in effect as “inventions” corresponding to no hard external reality (MacKenzie 1990). National interest can also serve as a potent force blinding high-tech organizations from taking a critical look at their own weaknesses, as was demonstrated by the spectacular and tragic explosion of the space shuttle Challenger in 1986 (Vaughan 1996).

336 If states dominate the world of military innovation, capital enjoys relatively freer rein when it comes to the manufacture of new consumer commodities. Here is where large corporations, including the multinationals of the global arena, come into their own. The freedom of capital, however, is itself constrained by social structures. Historians of technology have long noted that what gets invented often reflects prior orderings of power in society, for example, the dynamics of race, class, and gender. The technological artifacts of the modern world “have politics,” the political scientist Langdon Winner argued, either because they are designed to solve social problems or because they mirror existing regimes of dominance (Winner 1986). Feminist studies of technology are sensitive to the migration of classical gender attitudes into biomedical invention, especially those related to sexuality and reproduction (Oudshoorn 2003; Thompson 2007). Gendered social relations permeate the innovation process

more broadly, through understandings of women's place in the labor force that in turn affect technological design. Thus, the modern inventions that made housework easier only reinforced a gendered regime of work that heightened expectations of domestic cleanliness and efficiency, making "more work for mother" (Schwartz Cowan 1985).

- 337 An important feature of the dynamic of innovation is capital's drive to seek out new forms of commodification. Innovation consists in part of turning things that were not previously in an exchange system into things that can be bought and sold. The point to note for social progress is that this power of commodification is not evenly distributed around human societies. Accordingly, the literature exploring trends in corporate-driven innovation offers at the same time also a reflection on inequality (Jasanoff 2016).
- 338 Biological innovation has proved to be an especially rich site for critical inquiry into the creation of new forms of value through science and technology. The forms of extraction and manipulation enabled by recent major advances in knowledge and technique have aroused considerable anxiety about who governs human bodies and selves. The discovery of the structure of DNA and the industrialization of genetics in both agriculture and biomedicine have drawn attention to unequal power relations in the development of biocapital (Sunder Rajan 2006, 2012; Skloot 2010). First-movers, usually in Northern countries, enjoy considerable advantages in shaping bio-innovation trajectories, ranging from setting research priorities to enrolling populations in poorer countries to serve as research subjects (Petryna 2009). Imbalances of power exist even within wealthy states, as evidenced by the highly contested and ultimately unsuccessful effort by a state-corporate alliance to create the Icelandic Health Sector Database (Rose 2001; Fortun 2008). Biomedical innovation threatens to perpetuate stigmatized categories of race and gender, although the discourse of genetic discovery claims to have eliminated the basis for such invidious distinctions (Reardon 2004; Epstein 2007; Kahn 2012). Even moves intended explicitly to benefit less advantaged societies, such as the nutritionally enhanced Golden Rice (Smith 2009), may serve to narrow both the pathways and the opportunities for innovation from the bottom up (Scoones 2006).
- 339 Capital's innovative force manifests itself not only in the extraction of new resources, such as human biological materials, but in the extension of the market itself into areas where commerce and commodification were once thought to play no role. A by-product of this dynamic that is widely regarded as beneficial for society is the extension of market principles to forms of environmental behavior, thereby putting a price on nature itself. That move, enabled by the

burgeoning fields of environmental and ecological economics (Costanza 1997), made it possible to create new markets in chemical and carbon emissions and to permit exchanges between activities not previously deemed commensurable, such as trees and human-built water cooling plants. The resulting exchanges between those who produce “too much” and “too little” of environmental detriments makes it possible in theory to reduce the total burden of undesirable by-products such as pollutants and carbon emissions. However, analysts have called attention to the inevitable fictions and flaws that enter into the calculations underlying such market-making (Mackenzie 2007). At the limits, the models operate not as reflections of a real world but as entities that make the very realities they presume to represent. Market devices are in this special sense “performative” (Mackenzie et al. 2008; see also Callon 1998).

340 In the era of climate change, there is a particular focus on the role of innovation in altering the ways we use and depend on earth systems for human livelihoods and, indeed, the future of the human race. Whether through a “moonshot” that solves the world’s energy problems without compromising economic growth,[\[35\]](#) or through countless smaller innovations that may lead to more sustainable ways of living on Earth, the idea of the “technological fix”—or solving society’s problems by technological means—has gained a new hold on the scientific, engineering, and policy imaginations. The response from STS analysts adds up to a call for caution, especially in the design and adoption of one-size-fits-all solutions at a planetary scale.

341 One strand of that literature focuses on the contingency of the models and experiments that underpin attempts to forecast climate impacts, and the unavoidable indeterminacy of what is known (Jasanoff and Wynne 1998). These observations suggest that singular engineering solutions, such as solar radiation management, should be approached with care if not reluctance (Hulme 2014; Stilgoe 2015). Another strand stresses the need for governance structures and processes that make due allowances for ethical deliberation in making large-scale climate change and other sustainability decisions (Rayner et al. 2013; Newig et al. 2008).

#### 342 **6.4 Interactive Innovation: The Role of Norms**

343 Theorists who stress agency and those who stress structure as drivers of scientific and technological innovation have one thing in common. Both presume that the purposes of innovation are unproblematic or self-evidently good, such as the need to combat disease and hunger, extend human life, enhance cognitive and to some degree physical faculties, or protect people against attacks on their security and well-being. Sad, unfortunate, and even disastrous outcomes of technological projects are seen, in the light of this

assumption, as “unintended consequences” of a forward trajectory of development whose inbuilt drives are seen as beneficial and thus not open to ethical or moral questioning.

344 STS writing has opened up this relatively comfortable understanding of technological change through inquiry into the institutionalized patterns of belief and practices that inscribe norms and values into innovation. This body of work suggests that entrenched power structures and belief systems exert a profound influence on the directions of technological innovation. Equally and symmetrically, technological innovation can underwrite and indeed legitimate the structures that define society. This mutual interplay of the social, the scientific, and the material is best described in what is termed the idiom of co-production (Jasanoff 2004). That lens for looking at the world particularly brings to light the normative foundations of technological change, showing how collective imaginations of good or undesirable futures—or “sociotechnical imaginaries” (Jasanoff and Kim 2015)—leave their imprint on processes of innovation.

345 To begin with, the ideas of “innovation” and the “market” themselves are far from neutral. Attempts to realize them naturalize particular definitions and their accompanying values, which resist being rethought even in times of crisis (Mirowski 2013). The culture of Silicon Valley, for example, has lent new luster to “disruptive innovation,” an idea that is conventionally traced back to Joseph Schumpeter’s notion of creative destruction. Detached from context, the term sounds like a force of nature that simply rejuvenates, replacing old, worn, and presumably no longer useful or efficient things with newer, improved substitutes. However, insights from STS about the production of newness offer a constant reminder that disruption, too, is a complex social process, with political implications, such as producing winners and losers, people who gain and people who suffer. Making markets, too, involves at its core making things commensurable, hence calculable and exchangeable, and this likewise is far from a value-neutral process (Espeland 1998). Thus, the innovative market that permits trading in carbon was seen by its creators as an ingenious technical solution to climate change. But critics in developing countries saw the like treatment of all emitted carbon as deeply political, in that it erased the histories by which some countries became higher emitters, as well as the contemporary social inequalities between the poor who generate greenhouse gases through subsistence activities, such as farming, and the rich who increase emissions through luxuries such as flying (Agarwal and Narain 1991).

346 Viewed in the framework of co-production and sociotechnical imaginaries, neither agency nor structure look like independent variables or primary drivers of change. Rather, each is further

embedded in deep-seated ways of thinking about how things hang together in a given society and how they could be transformed so as to make the world a better place. Imaginaries, for example, bring with them particular understandings of government's appropriate role and capabilities. Thus, in a comparative study of nuclear power in the United States and Korea, Sheila Jasanoff and Sang-Hyun Kim argued that the two nations' policies rested on different compacts between state and society. In the early days of nuclear energy, US policy played out an imaginary of containment that promised expert control of atomic risks; public skepticism, however, led to a *de facto* moratorium on further development after the Three Mile Island accident in 1979 undermined expert claims. By contrast, South Korea, under the banners of developmental nationalism and technological competitiveness, continued to build power plants, even after Chernobyl, and eventually positioned itself as a leading exporter of nuclear technology and know-how (Jasanoff and Kim 2009). Similarly, significant differences in the embrace of agricultural and biomedical biotechnologies in the United States, Britain, and Germany were shown to reflect cross-cultural differences in public expectations concerning the state's handling of risks and its construction of policy-relevant evidence and reason (Jasanoff 2005).

347 While comparative analysis sheds light on the role of national political culture in steering innovation trajectories, era-defining ideologies, such as deregulation, privatization, neoliberalism or sustainability, cut across national specificities and may create convergences across geopolitical boundaries. For example, the rise of genetics and genomics, coinciding with a global turn toward neoliberal policies, arguably has increased worldwide demand for personalized data and individually tailored precision medicine, along with expectations that genetically informed citizens will assume more responsibility for their own health (Rose 2001; Rose 2007). The targeting of the human brain as a major object of research funding in Europe and the United States in the past decade or two illustrates similar convergences in play. The imaginary of a zero-carbon future is fueling worldwide investment in renewable energy sources, new modes of transportation, and "smart cities." Yet, sociotechnical imaginaries operating at regional, national, and subnational levels can be expected to keep tempering these global trends and to introduce localized differences in research and development priorities, as well as in resulting technological applications (Jasanoff 2005; Jasanoff and Kim 2009, 2015).

## 348 6.5 Conclusion

349 The major contributions made by social analysts of science and technology to understanding innovation are twofold: first, to offer a thicker description of all that is involved when one technological

order is replaced by another; and, second, to problematize the very concept of novelty, asking for whose benefit the new order is built and whose purposes it serves. The first line of inquiry focused attention on the machinery of innovation, drawing attention to its material, economic, and institutional supports. Actor-centered accounts stress the creativity, but also the resistances, involved in pulling together these heterogeneous elements to produce durable innovations that are widely taken up by society. Structuralist analysis, by contrast, emphasizes the lasting infrastructures of built physical environments, capital, or law that promote and shore up forms of innovation reflecting underlying imbalances of wealth and power. According to such accounts, innovation steered from the top down mostly uses new means to perpetuate older topographies of power, such as the gravitational pull of state sovereignty and corporate capital. Both bodies of work warn against being too sanguine about the reformist potential of innovation, although actor-centered accounts do suggest that ideas and influence can originate from any point in the networks of production, and that consumers, users, and workers can shape innovation trajectories through their active participation or resistance. Against these lines of work, a third approach places the purposes of innovation at the center of the analytic lens. Stressing the co-production of epistemic, material, and normative arrangements in the world, this line of work reveals the shared imaginaries of desired or undesired futures toward whose attainment, or prevention, innovation is directed. This analysis suggests that deep changes in society's visions for itself are likely to change the direction of innovation, perhaps even rendering some imaginable technological pathways (germline gene engineering, nuclear weapons) out of bounds for society. It offers in this way a prescription for aligning innovation more securely with the positive goals of social progress, by inviting citizens to build and implement sociotechnical imaginaries of just, inclusive, and sustainable worlds.

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## **7. It could be otherwise...normativity in the social sciences**

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The idea of social progress is inextricably intertwined with the origins of early modern science, although not in a straightforward way. Progress never was linear. It has always been more of a groping effort towards human betterment, accompanied by the distinctive feeling that the desired outcome probably would turn out different from what was expected. Early modern science provided a more

robust anchoring for this voyage into an unknown future, based on the systematic exploration of the natural world. Among historians of science, the genesis of what came to be known as *The Scientific Revolution* and its impact on the birth of the modern world remains a contested topic (Shapin, 1996; Orthia, 2016). Shunning accounts of the achievements of great scientists in the last decades opened the way for approaches and methods that emphasize contextual factors and the actual practices of science which emerges as an eminently social undertaking. The striving to uncover the secrets of nature is seen as intermixed with mundane and practical concerns. The image of the lonely genius is replaced by the often dense and heterogeneous networks that allowed for the exchange of ideas, people, and practices (Mokyr, 2016). They stretched across Europe, and the globe following Europeans colonizing the world. In these networks, an altered concept of the future was born.

352 Instead of seeing the future predetermined by fate, the radically novel idea became accepted that it could be otherwise. By extending the time horizon, it also became conceivable that the future was open to human intervention. For the first time, the idea of human betterment – including a wide range of material conditions – entered the realm of feasibility through a combination of a better understanding of how nature works and practical know-how applied towards easing the burdens of everyday life. It was the *belief in progress* that kept the enterprise of modern science going. It was the forward-looking, future-oriented project, shared among a distinct minority of scientists, natural philosophers, artisans and craftsman, notaries, apothecaries and other largely urban dignitaries. They also got material support of rulers and governments who had been persuaded that they had something to gain. The basis was the shared belief that a systematic exploration of the natural world would yield tangible, material benefits. The Baconian programme of modern science with its emphasis on practical utility was never far away from the sense of awe and wonder that modern science continued to elicit.

353 Initially, the belief in scientific progress included the belief that it would also lead toward moral progress. At a time when religious and civil wars were tearing apart communities and societies throughout Europe, hope turned towards the possibility of reaching consensus through argumentation and discussion similar to the ones scientists engaged in. Alas, this hope was short-lived. It was rekindled in the 18th century, when the Enlightenment, identified with one of the most powerful intellectual movements in Europe, held out the prospect of an explicitly modern understanding of the world and the place of humans in it (Robertson, 2015; Ferrone, 2015). In the *Encyclopédie*, D'Alembert offered a historical account of progress – *les progrès* – of knowledge and human understanding. The idea of *Aufklärung* reached a much broader scope through Kant's famous

definition as the freedom to make public use of one's reason with the goal of liberating mankind from its self-imposed immaturity. If the core of the Enlightenment's contribution to Western thought lies indeed in the prospect of human betterment, with its political economy firmly anchored in the present, its perspective was that of the progress of society. It would be achievable through the use of reason. The core idea of the ability of *Rational Man* (yes, mainly men) to solve problems through rational discussion persisted far into the 19th century. It was core to liberalism and also the establishment of nation-states as imagined communities of rational people. And it became embedded in international organizations, many of which were founded during the second half of the 19th century and led to thinking that wars can be overcome through rational decision-making (Kaiser and Schot, 2014). This is one reason WWI turned out to be such a shock.

354 *Les sciences morales*, conceived in the 18th century, were intended to be equivalent to the natural sciences. The *split* between what was to become on one side the thriving and dominant natural sciences, and on the other side the social sciences, was by no means a foregone conclusion (Heilbron, 1991). Besides the many other factors accounting for the split, it might well be that the development of the concept of technology turned out to be the dividing wedge. Technology came to be understood as applied science, excluding social and economic aspects, and escaping moral judgment. Technology was believed to be a neutral irresistible force bringing about social progress. The handling of this force was delegated to experts. This may explain why this conception of technology underpinned all major ideologies of the 20th century, from Marxism to Fascism and Liberalism, and why technocracy could attach itself to all three, leading to a shared legacy which shaped in a deep way the development of nation-states, international organizations and their social progress agenda.

355 In a technocratic framework, the production of scientific knowledge and the making of technology are disconnected from the negative impacts they might generate. The technosciences are to be set free and protected, like the goose whose Golden Eggs are desired, while it is left to the State (helped by the social sciences) to manage impact and to mediate unwanted consequences. Progress became predominantly equated with *technological* progress - highly visible and tangible. Technological progress would chart the route towards modernization and social progress would follow in its wake. Negative impacts persisted in the shadow of technological progress as an irritating reminder that neither technology nor technological fixes can solve all social problems. As a consequence, the discussion was no longer whether specific technological options should be promoted (as was still the case with the Luddites who opposed de-skilling

innovation, but certainly not all innovation) but how to use technology for modernizing purposes. More technology simply meant 'progress of society.' Technology became the measure of men (Adas, 1989). This was by no means confined to the Western world. This idea circulated across the globe, and colonizers working with local elites used the colonies as testbeds and laboratories for experimenting with technology and the social progress it would bring (Diogo and Van der Laak, 2016).

356 Following social progress through measurement and comparison has always kept some affinity with the natural sciences. From what was termed *social physics* by Quetelet to statistics as a well-equipped arm and instrument of the State, the information and knowledge thus gained was predominantly collected in the service of the State and processed to be able to control its population. Beginning with regular measurements of the height of young men for army recruitment a host of other indicators followed to keep track of almost everything the State was interested in and capable of measuring. Statistics were used to measure the wealth of nations and to quantify people. (Hacking 1986; Porter 1995; Scott 1998). Behind the numbers and advances in quantification techniques, serious social scientific arguments began to lay the theoretical and methodological foundations of some social science disciplines. Economics, originally conceived as political economy, continues to be seen as the dominant social science (even if, at times, it does not want to see itself as a *social science*). The measurements economists use, especially GDP, still function as the dominant yardsticks despite the many objections that have been raised. Criticisms include that value is allocated only to certain activities, while others are eliminated completely, like the costs of pollution, informal care work, but also digitally delivered services. However, social progress has not only been measured through the economic lens. Other societally desirable goals and yardsticks continued to be articulated by reformers, political activists, social scientists and engineers, and social movements. One of the latest manifestations are the seventeen Sustainable Development Goals (SDGs), agreed upon by the United Nations in 2015. They form part of a wide variety of efforts at national and international level to employ concepts and instruments that enable collective action with the explicit aim to produce better outcomes for the huge variety of present-day challenges.

357 Other branches of the incipient social sciences, especially sociology and political science, also became engaged in describing, measuring, analyzing and proposing policy measures to alleviate the massive fall-out and widely felt consequences of the Industrial Revolution. This epochal transformation which led, in Marx's formulation, to "everything solid melts into air" spawned waves of social surveys undertaken by doctors, epidemiologists, sociologists, statisticians

and others to find out empirically how the industrial working class was living and working, crowded in rapidly growing dense urban conglomerates. Amid this social turmoil, the shaping of social sciences disciplines took place (Wagner et al, 1991). At the center was what became known as 'the social question', fueled by the fear of the bourgeoisie that the underlying conditions could induce massive and violent uprisings. Eventually, and facilitated by a number of truly remarkable social innovations, such as a comprehensive social insurance system, what was widely perceived and experienced as social progress took form – the rise of the Welfare State.

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A complement to the idea that negative impacts of science and technology, such as safety, unemployment, health risks, are not the problem of those who produce them, is the assumption that in the end the overall balance will be positive and everyone will benefit. Schumpeter famously defined innovation as 'creative destruction' and rightly saw it as a double-edged sword. But neither he nor his followers went further to ask: 'Who' will end up on the destructed side or which destructions are shifted to other parts of the world? For him, the creative element outweighed the destructive one. Arguably, we can ask the question whether this is still the case. Perhaps the destructive elements of technical change have begun to overshoot the constructive ones (Soete, 2013). The immense challenges humanity faces today, from climate change, loss of diversity, nuclear disaster to deep inequality, carry the danger of a massive and irreversible destruction, revolt and ultimately war which is highly unlikely to be countered by relying solely on science and technology promoting economic growth and national state inventions. New ways of measuring social progress which can account also for longer-term impact and are explicitly inclusive are badly needed, as well as new practices for incorporating the results into the very process of science and technology development redirecting it to respond to the SDGs, and by doing so avoiding ex-ante some of the negative impacts to emerge.

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Historically speaking, the social sciences grew up in Europe in the shadow of the 19th century Nation State. Although the natural sciences also enjoyed a close relationship with the State, especially through their military-industrial connections, the dependence of the social sciences upon the State has always been much stronger mainly due to the kind of problems they study. Accordingly, their institutionalization as academic disciplines greatly varies between different countries. However, the boundaries between civil society, social actors, and social movements were never completely closed. This double and often contradictory allegiance – an intimate relationship with the State and the more porous boundaries with society - produced fertile ground for contestation. It continues to foster critical analysis. To this day, taking a critical stand based on

tacitly assumed or explicitly expressed values and norms forms part of the identity and self-image of the social sciences. However, in particular after WWII, the ongoing professionalization of the social sciences (and humanities) also leads to a greater distance from the State and to a more distanced stance from the idea of practical relevance to societal concerns. This tendency is exacerbated by the narrowing of 'impact' and its academic measurements towards the business-friendly introduction of rankings and citation measures focused solely on scientific excellence.

360 The upshot of our argument is that if the social sciences are to become more deeply engaged again with enabling social progress, it will also have to engage with science and technology, and innovation working in close alignment with the natural sciences and engineering disciplines. They will need to convince their colleagues that social progress cannot be disentangled from technological progress, social progress is built in the choices made for certain technological options, and questions about potential impact and consequences of a wide and diverse range of possibilities must be injected upstream in a collaborative way. It is in this area that the field of Science & Technologies Studies (STS) has made its greatest contributions: making visible the relationships between and co-construction of the social and the technical and, more recently, nature too. As a consequence, it calls for a democratization of science and technology and new ways of relating democracy to technocracy.

361 Sometimes it is questioned whether social sciences can make a contribution to social progress at all. As a consequence, the social sciences continue to be underrepresented as well as underappreciated in many parts of the Non-Western world, where governments, but also parents, accord higher value to engineering, ICT, management and business studies. Publicly celebrated spectacular 'breakthroughs' are rare in the social sciences. Yet, they exist. Working in alignment with the State, they can look back on numerous successes that have contributed to manage many aspects of modernizing life, ranging from the development of energy, transport and communication infrastructures introduced with help of economists and social scientists developing new business models, institutional pre-conditions, and cultural repertoires, public health measures to reduce death rates to access to education for all. If these contributions are less visible to public perception, it is partly due to the societally more diffuse nature in the production and utilization of social scientific knowledge.

362 The problems the social sciences face in the 21st century are formidable, and discussed extensively in the various chapters of this report. Climate change, massive inequalities, global migration, digitalization, transnational workflows and other factors marking a

shift in power between globally operating corporations and the capabilities of traditional national institutions to cope with these challenges, the emergence of new types of war, the rise of megacities - all these phenomena and processes are linked to globalization while going far beyond. Yet there is another challenge. Modernization has created a set of sociotechnical systems for the provision of energy, mobility, food, healthcare, water etc. which has reached the limits of what it can deliver in a globalized world. Equal access to services and provisions these systems provide demands a deep and systemic transformation of the material backbone of our current civilization (Schot and Kanger, 2016). This entails moving away from systems built upon abundant availability of fossil fuels.

363 A main question is who will be responding to this world in transition. The altered relationship between state and the market has catapulted problems of *governance* to the forefront. Many institutions operating today have been designed in the past to confront other problems and perform other functions. Their adaptation is slow and tested knowledge of how to design new institutions, better fitted to resonate with problems of a more intricate and interconnected nature, is in short supply. As *governance* cannot simply be ordered from above, new alignments among the various stakeholders are needed. It is doubtful, however, whether the current relationships between state, industry and civil society mediated by various kinds of scientific-technological experts are sufficiently inclusive, calling again for experiments with novel forms of *governance*.

364 The social sciences also have yet to fully come to terms with this world in transition. For example, they will have to develop new concepts which are less state-centric, assuming the nation-state as the natural unit of analysis. This process is well underway. However, they also need to keep up with their empirical database under conditions which have changed dramatically in the era of Big Data. Information and empirical data that once were within the tutelage of the State, and hence at the service of the social sciences, has partly, or largely, shifted under the private ownership and control of large corporations like Google and Amazon. Access to an expanding and ever more relevant database, tracking facets of social behaviour that was unavailable before, has come under unexpected restrictions, although not only for the social sciences. Also for this reason, it will be important to forge new alliances with the natural sciences beyond instrumental-utilitarian considerations. As algorithms and computation are rapidly altering our views how complex systems evolve and function, the social sciences will not remain untouched by these advances. An algorithm reconfigures and adapts to changes in a system that it has created. Algorithms can be very useful to

construct alternatives and to open up to sociotechnical imaginaries. Social systems as complex adaptive systems cannot be left to the natural sciences alone.

365 We can summarize this impressionistic account by arguing that a major challenge ahead is the development of a productive close interaction between the social world and the science-based technologies. This calls for a much deeper understanding of the forceful role of science and technology in shaping the present world, while equally understanding how we, the social world, creates, shapes, selects and embeds scientific knowledge, technological artifacts into the sociotechnical systems in which we live and work. One of the urgent challenges ahead is therefore how to overcome the current split between the social and the natural sciences and reach better alignments across different disciplines and practices. STS have a crucial role to play in this. To succeed, STS will have to address issues of social progress head on and STS scholars will have to become reflexive constructivists engaged in constructing a new world, using the tools it has developed, but moving beyond a de-constructivist reflex.

## 366 7.2 Where to go from here

367 In the policy areas dealt with in Part I of this chapter, the idea of social progress, in its plural understanding and multiple dimensions, emerges as underlying motive and driving force, even if policies are shaped by and react towards the dominant structures of power and interests. Despite the great variations displayed in the overall policy landscape – which is still far too little integrated – one common element becomes clearly visible, aligned with the argument above. It is the struggle for the *right kind of governance*. It shows up and is explicitly articulated in the dominant policy discourses and paradigms which are performed by some of the key players and institutions at international or national level. Yet, these discourses and paradigms are often hotly contested, precisely because they become entrenched when being performed by key players. Calls for a change of governance brought forth by bottom-up initiatives, social movements, and citizens are at a disadvantage to be heard, let alone to oblige policy-makers and governments to respond to them.

368 As the winds of neo-liberalism blow across much of the globe, a new hierarchical split occurs which manifests itself in a horizontal way. It is exemplified by the emergence of an interconnected, highly educated professional elite who have adopted a cosmopolitan lifestyle and easily move across the globe. Their influence extends to policy-making in areas where their interests are involved. The split manifests itself in the growing gap between these elites and all those who claim that they have no say. A growing number of people,

including middle-class, feel that they have been left behind. They voice their anger and frustration in giving support to populists, right-wing and nationalistic movements in many countries and, increasingly, also across countries. The 'disconnect' between the elites and those who claim to be 'the people' has many unforeseen consequences. One is that it has led to a marked decline in the value attached to expertise – be it professional and scientific or simply observing the standards that prevailed in public argumentation. The decline in expertise goes far beyond the loss of trust in science which has been deplored since some time. It amounts to the devaluation of the main currency of modernization. It has far-reaching implications for policy advice everywhere. It transcends legitimate questions like 'whose voice is being heard' or 'whose evidence' is being evoked in public discussion of policies under contestation. It goes to the heart of the ways in which novel and still precarious forms of governance can be designed and experimented with. Without legitimacy, there can be no institution building and no institutionalization. The outright and wholesale denigration of expertise represents a serious threat to reshaping policies so that they can meet new challenges. While there is a growing realization that expertise is ubiquitous, time has come to rethink its role, especially in mediating between knowledge production and application taking context into account. Empirically, science has a limited function in providing reliable knowledge for practical political purposes. There is a recurrent need to embed the decision-making processes with stakeholders groups originating from outside science (Grundmann, 2016).

369 One of the most pressing concerns for the social sciences is therefore to devise ways in which the legitimate concerns of citizens can enter the various policy arenas. Policies can be fiendishly technical. They are usually framed in complex legal language and regulatory arrangements. The task appears even more overwhelming when citizens are to be invited to inject their sociotechnical imaginaries and values into processes and procedures that have – not yet – been designed to incorporate them. These processes are now separated from the development of science and technology itself, as they are part of managing impact. Once more, new ways of developing sociotechnical solutions to the problems we face are needed which reach out and include citizens and social movements. Values frame and inform which options and information are to be considered or ignored. As public controversies concerning scientific-technological developments have made abundantly clear, contested values cannot be adjudicated by appealing to science either, nor can they be separated from their incorporation into scientific and technological developments. Values are already embedded into choices that have been made and will continue to influence choices to be made in the future. Social scientists are much aware and self-conscious about projecting their own values into research. Some take

pride and even see it as their professional obligation 'to be normative.' Elaborate methodologies have been evolved to straddle the thin line that separates professional and ethical standards from personal conviction and advocacy. There are occasions when taking a normative stand and to position one's advocacy are not only considered legitimate, but necessary. There is also agreement that scientific knowledge, neither in the natural sciences nor in the social sciences, is or can ever be value-free. There is widespread and full allegiance to a mutual reinforcement of science and democracy that provides sufficient space for values shared in liberal democracies to enter, inform and shape scientific discourse (Rosanvallon, 2014).

370 So, are we back to the Enlightenment ideals of rational discourse between engaged citizens or do we have other observations and proposals to add? Citizens are currently included in the making of new technologies and scientific advances in quite unexpected ways. These are the mostly well-educated citizens who have seized the opportunities offered by the thriving ICT sector. On a voluntary basis, they provide data on almost every aspect of interactive social behaviour, collective moods and individual sentiments together with data on their health, mobility, and consumer habits. The large corporations of GAFA (Google, Amazon, Facebook, Apple) use them for predictive analytics when designing their products. This kind of 'engagement' of citizens on a profit-oriented basis, allegedly conducted in their interest, has led to concerns about privacy and surveillance, questions about ownership, access and the right 'to be forgotten.' As we noted before, the data are proprietary. They cannot be accessed by social scientists either.

371 But there also exists a large part of citizens who are excluded or deprived of voicing their concerns, which go beyond a digital divide. They feel evicted by the society they knew. This brings us back to the question of values. In times of disorientation values often are presented as the only firm anchoring points. Yet, rationales often do not match and a plurality of values pervades our societies. This needs to be acknowledged if institutions, designed for mutual learning and bridging, providing new spaces for experimentation, are to be built.

372 The work of IPSP has been inspired by a belief in value pluralism. There are many plural ways toward achieving social progress and advancing social justice. However, when it comes to the articulation of concrete policies, some areas seem to be legal-technical minefields, underpinned by vested interests from governments, corporations and other powerful actors. It is not easy to see how values and norms can be introduced and upheld beyond professing general principles. The test, as always, comes through contestation. Therefore, the work done by courts and a well-functioning legal

system is equally crucial, all the more at international or trans-national level where the law is 'soft' and many policy areas are shrouded in an undefined grey zone.

373 The policy area of science, technology and innovation is currently invaded by many initiatives that propagate 'openness.' Various efforts are under way to promote Open Science, Open Access and Open Innovation. They are complemented by EU-sponsored activities like Responsible Research & Innovation. The political intention is to send out signals for citizens to become actively involved, pioneered by a movement towards citizen science. It continues to be particularly strong concerning the environment. Likewise, the field of health and biomedicine has since some time seen the self-mobilization of patients groups and of groups advocating patients' rights. In education a decisive shift has occurred towards more interactive forms of teaching and learning, reinforced by the massive introduction of ICTs gaining ground in and outside schools. Arguably, there is much to be learned by these various efforts and informal experiments and much of it has been closely followed by research undertaken in STS. It needs to be followed by a scalable take-up of successful experiments, taking the structural context into account and finding ways of institutionalizing them.

374 As the benefits and limitations of participation are becoming better understood, the challenges represented by demands for more inclusiveness also become clearer. Among others, they appear at the interface of institutional responsiveness, the relative closure of administrative procedures, the volatility of social media and public opinion, the heterogeneous nature of publics and the specific configurations of each policy field.

375 The overall picture that emerges from analyzing the contributions from the social sciences to policy-making and action is therefore one in which their contributions continue to be solid and strong, even if they are not always visible and appreciated. They take place and are constrained by the specific institutional framework of the policy-field in which they operate. As always, context matters. The distribution of social science knowledge in each field also varies considerably. It influences not only the overall balance or lack of power, but also future prospects for the social sciences to 'be normative'. In other words, the specific situatedness of social scientists in the policy field in which they operate matters. Simultaneously, they work within a given institutional policy context as well as outside and against it. In some fields and depending on how welcome the incorporation of more normative content is, this leads to open contestation. The appeal to 'evidence-based' policies, whether mere rhetoric or

seriously intended, neither can nor will provide a solution accepted by all. The question of who provides legitimacy and under which conditions remains context-dependent.

- 376 In what turned out to be his last lecture given at the Collège de France, the eminent sociologist Pierre Bourdieu gave a moving testimony of the place of reflexivity in the social sciences, ending with a sketch of 'auto-socioanalysis'. The social sciences, he argues, enjoy only weak autonomy. They are under greater pressure from outside and the conditions for their inner autonomy are less favourable. Practical or reformist reflexivity, in contrast to narcissistic reflexivity, consists in 'objectifying' the social conditions of possibilities that enable and limit the actual work of the social sciences. In detailed analysis, he exemplifies how critical reflexivity proceeds, showing how his own life-long scientific work – normative by any standard – was fashioned, enabled and constrained through the structure of the scientific field and the hierarchies as they existed in France at the time. He highlights the epistemological and practice-oriented differences between points of view, visions and taking a normative stand. He leaves space for intuition, the 'creative imagination' which arises from social experience that has been subjected to critical analysis. In the end, however, reflexivity only gains effectiveness if it takes root in the collectivities that practice it. In any research group, collective censure is strong, but it can also be liberating – liberating each participant from the 'bias' linked to their positions and dispositions (Bourdieu, 2001).
- 377 In the search for the right kind of governance and ways of being that are more inclusive, to give citizens a chance not only to voice their grievances but to become actively involved, it is worth re-reading Albert O. Hirschman's magistral *Exit, Voice, Loyalty* (Hirschman, 1970). We have recently seen unprecedented waves of a kind of *Super Exit*. It is not only about Brexit. It reveals itself in many places in the frenetic and chaotic desire to escape, a genuine flight from reality towards an undefined, imagined nowhere, coloured by nostalgia for a past that never was and seeking certainties that simply do not exist. It can take on more sinister and violent forms when it mixes with political extremism and religious fundamentalism.
- 378 One of the main - and decidedly normative - tasks of the social sciences has always been and even more so now to open up towards the realm of possibilities. To show in scientifically plausible ways that *it could be otherwise* (Nowotny, 2015). This is a task that goes beyond the technocratic policy options that experts prepare for policy-makers to choose from. It originates from tapping into one's own creative imagination and into collective sociotechnical imaginaries. It comes from building models when the assumptions on which they

are based are critically reflected. It draws from many sources that the social sciences have creatively used in the past and which they continue to adapt and expand.

379 But this is not sufficient. In order to open up towards the realm of the possible, the social sciences must stimulate a public debate, making room for multiple perspectives, allowing for contestation. What is needed is nothing less than to redefine *Voice* in ways that can strongly resonate with and within the diverse and complex policy landscapes. The ultimate goal, however, will be to re-articulate what Hirschman meant by *Loyalty* as the basis for communal identities, solidarity and action. It is no longer sufficient to express loyalty to a political party or a social group. This kind of loyalty has been eroded through processes of individualization and marketization, reinforced through the effects of social media. What can it be replaced with? Loyalty – to whom and to what?

380 In the 19th century, the overriding question for the social sciences was how there can be social order when faced with the economic turmoil following the Industrial Revolution and the political upheavals that gave birth to liberal democracies. In the 21st century any social order must come to terms with globalization and its discontent, with the major ongoing geopolitical shifts and the grappling efforts to avert a further depletion of natural resources for a still growing world population and their rising aspirations. It is intrinsically intertwined in ever closer processes of coproduction with the amazing advances of possibilities offered by science and technology – possibilities that far outnumber what can actually be realized. The challenge for the social sciences consists in imagining, conceptualizing and designing feasible and effective processes of selection and social shaping that are more inclusive and driven by a commitment to social justice for all. One of the challenges of the 21st century for the social sciences will be to redefine *Exit*, *Voice*, *Loyalty* within a space of possibilities firmly anchored in the normative belief that *it can be otherwise*.

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- 760 [9] Thanks to Dean Jamison for pointing out the simplicity of the solution in John Snow's case.
- 761 [10] Williamson (1989). Also Rodrik (2004.)
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- 767 [16] Jones and Sakong, p. 109
- 768 [17] Robert Wade (1996) explored in depth how the World Bank's analytical work responded to the East Asian experience, including a detailed examination of the analytical choices made in the East Asian Miracle study.
- 769 [18] Details of the Doing Business indicators, including links to a variety of research papers underlying the methodology and published in academic journals are available at <http://www.doingbusiness.org/methodology> (<http://www.doingbusiness.org/methodology>)
- 770 [19] One common criticism is of the way in which the indicators seemingly conflate light regulation with better development policy; a second criticism is their focus on de jure regulation rather than how regulations are experienced de facto by firms.
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- 774 [23] World Bank (2008)
- 775 [24] Acemoglu and Robinson, *Why Nations Fail*, pp. 436, 444 446, 450.
- 776 [25] For a comprehensive analysis of 'new public management' and the track record of its implementation in OECD countries, see Pollitt and Bouckaert (2011).
- 777 [26] North, Wallis and Weingast (2009); North, Wallis, Weingast and Webb (2013); Fukuyama (2012, 2014. Pritchett and de Weijer (2010) calculated that even if one assumed the most rapid rates of institutional improvement that have ever been observed historically, it would take over two decades for low-income and fragile Sierra Leone to reach levels of institutional capability approximating those of less-low-income, but nonetheless institutionally imperfect Ghana.
- 778 [27] NWW p.32; 264-5.

- 779 [28] These include Matt Andrews (2013); David Booth and Diana Cammack (2013); Pritchett, Andrews and Woolcock (2010); Fritz, Levy and Ort (2014); and Levy (2014). All of these are in the spirit of the path-breaking earlier effort by Ricardo Hausmann, Dani Rodrik and Andres Velasco (2008). For an example of an earlier generation of work which made a parallel argument to some of the recent contributions, see Lindblom (1959).
- 780 [29] Carothers (2013) p. 264.
- 781 [30] Kanbur (2016)
- 782 [31] This, according to Hirschman's biographer, Jeremy Adelman (2013, p. 632) was the title Hirschman wanted to use for one of his last books; his editor, however, persuaded him to maintain the original title, *The Rhetoric of Reaction* (1991).
- 783 [32] Hirschman (1991), p. 7.
- 784 [33] Hirschman, "Political Economics and Possibilism"
- 785 [34] Hirschman (1991), pp. 167-170.
- 786 [35] For an instructive look at the ways that today's high-tech capitalists conceive of world-changing innovations, see Andrew Revkin's interview of Bill Gates, *New York Times*, February 23, 2016, <http://dotearth.blogs.nytimes.com/2016/02/23/bill-gates-the-impatient-optimist-lays-out-his-clean-energy-innovation-agenda/> (<http://dotearth.blogs.nytimes.com/2016/02/23/bill-gates-the-impatient-optimist-lays-out-his-clean-energy-innovation-agenda/>).