

Directing Innovation Towards Just Outcomes: The Role of Principles and Politics

Theo Papaioannou

Development Policy and Practice, The Open University, Chambers Building

Walton Hall, Milton Keynes, MK7 6AA, UK

E-mail: t.papaioannou@open.ac.uk

Abstract

Contemporary innovation theorists tend to defend a combination of Schumpeterian and Keynesian politics of innovation as a solution to the problem of directionality of new technologies towards socially just outcomes. Their hope is that the Schumpeterian motor of innovation would keep entrepreneurs incentivised to take market opportunities and the Keynesian state would invest in infrastructure, redistributing risks and rewards of new technologies. In contrast, Hayekian theorists of innovation insist that top-down state interventions aiming at directionality suffer from epistemological and moral problems. For them, politics of innovation ought to abandon the idea of directionality towards social justice altogether because it is morally questionable and creates disincentives for taking up new risky ventures in the market. Instead, politics of innovation ought to be restricted in promoting an institutional environment that is conducive to entrepreneurship. I will argue that despite differences, both theoretical camps rely on liberal notions of morality and politics which justify predominantly distributional currencies of justice, overlooking questions of relational equality in innovation. Therefore, they fail to go far enough to eliminate unjust relations of private ownership, domination, and oppression within processes of production of novel technological goods and services (e.g., IPRs). Although such elimination would also presuppose some level of equal distribution of risks and rewards of innovation, this level would not be absolute and therefore it would allow for incentives of innovative entrepreneurship to be maintained. I will conclude that what really matters for the direction of innovation towards social justice is to introduce principles (from the bottom-up) and related politics which do not reproduce unequal social relations but instead equalise them through appropriate level of distribution of risks and rewards of innovation.

1. Introduction

Contemporary innovation theorists (Mazzucato, 2014; Perez, 2002; Fagerberg et al, 2013; Block and Keller, 2011) tend to defend a combination of Schumpeterian and Keynesian politics of innovation as a solution to the problem of directionality of new technologies towards socially just outcomes. These theorists implicitly and explicitly agree that such combined politics is crucial for transformative change, accomplishing missions such as tackling climate change, reducing poverty and inequality, dealing with pandemics, etc. Their hope is that the Schumpeterian motor of innovation (i.e., profit) would keep entrepreneurs incentivised to take up market opportunities while the Keynesian state would support them by investing in infrastructure, redistributing risks and rewards of new technologies.

In contrast, Hayekian theorists of innovation (Worstall, 2013; Mingardi, 2015; Wennberg and Sandström, 2022) insist that top-down state interventions in the free market, aiming at directionality, suffer from epistemological and moral problems. On the one hand, there is lack of detailed knowledge of innovation dynamics in the process of competition and on the other there is a moral risk of coercion of individual entrepreneurs by the state. For Hayekian theorists of innovation, politics ought to abandon the idea of directionality of innovation towards social

justice altogether because it is morally questionable and creates disincentives for taking up new risky ventures in the market. Instead, politics of innovation ought to be restricted to promoting a spontaneous institutional environment that is conducive to freedom and entrepreneurship.

This paper argues that, despite differences, both combined Schumpeterian- Keynesian and Hayekian theoretical camps rely on liberal notions of morality and politics which tend to justify predominantly distributional currencies of justice, overlooking questions of relational equality in the process of generation and diffusion of new technologies. Therefore, they fail to go far enough to eliminate unjust relations of exploitation, domination and oppression within processes of production and diffusion of novel technologies and goods (e.g. IPRs). Although such elimination would also presuppose certain level of equal distribution of risks and rewards of innovation, this level would not be absolute and therefore it would allow for incentives of innovative entrepreneurship to be maintained. What really matters for the direction of innovation towards social justice is to introduce principles (from the bottom-up and the grassroots innovation movements) and related politics which don't reproduce unequal social relations but instead equalise them through appropriate level of distribution of risks and rewards of innovation.

The paper is divided into five sections. Section 2 discusses the Schumpeterian-Keynesian politics of innovation. Section 3 analyses the Hayekian critique of politics of directionality and its epistemological and moral foundations. Section 4 puts forward the argument that both theoretical camps focus on distributive justice in the innovation process and therefore a relational approach is needed for directing new technologies towards just outcomes. Section 5 concludes by providing a summary of the overall argument.

2. Schumpeterian and Keynesian Politics of Innovation

More than 100 years ago, Joseph Schumpeter argued that innovation is what drives capitalism and economic growth. He defined innovation as 'The introduction of new goods ... new methods of production ... the opening of new markets ... the conquest of new sources of supply ... and the carrying out of new organisation of any industry' (Schumpeter, 1934: 66). The central focus of Schumpeter's definition is on the heroic entrepreneur who sees the opportunities and introduces new combinations to increase market share and maximise profits. Without profits there would be no capitalist development. Schumpeter's entrepreneur creates a new system of values by forcing innovative products into the market and propelling technological progress. Therefore, the role of Schumpeterian politics is to enable the profit motor of innovation by sustaining a liberal institutional framework of private ownership and credit creation. Within this framework competitive capitalism can evolve as a dynamic system. Like Marx, Schumpeter was convinced that capitalism can never be stationary but rather evolve in cycles of growth and depression. Yet for him, the direction of capitalism in general and of innovation in particular is unpredictable. In his Prologue to Part II of *Capitalism, Socialism and Democracy*, Schumpeter (2010: 53) asks: 'Can capitalism survive? No. I don't think it can. But this opinion of mine, like that of every other economist who has pronounced upon the subject, is completely uninteresting. What counts in any attempt at social prognosis is not Yes or No that sums up the facts and the arguments which lead up to it but those facts and arguments themselves'. Schumpeter's facts and arguments are about pervasive evolutionary change in the economy due to successive innovations which lead to capitalist development. He recognises that there may be tendencies in an observable pattern e.g., capitalism's economic and social failure but predictions about the future cannot be made. As Schumpeter points out 'Analysis

whether economic or other, never yields more than a statement about the tendencies present in an observable pattern. And these never tell us what will happen to the pattern but only what would happen if they continued to act as they have been acting in the time interval covered by our observation and if other factors intruded. “Inevitability” or “necessity” can never mean more than this. Schumpeter understands both uncertainty and ‘creative destruction’ as inevitabilities of capitalism which cannot be politically controlled in order for the system to deliver socially desirable outcomes.

It might be argued that this is a substantial point of difference with Keynes who, in his ‘The End of Laissez-Faire’ argues for political control of capitalism that predominantly focuses on individualism and utilitarianism. In his account, neither individualism nor utilitarianism in the economic sphere would deliver benefits to all. Keynes rejects that laissez-faire capitalism is a harmonious evolutionary process that requires non-interference by the state. Instead, he believes that the role of government is to mitigate egoism, promoting the public good. Individuals in capitalism are focused on money-making and take economic decisions on the basis of ‘animal spirits’. According to Keynes (2013: 291) ‘The most 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’. Keynes is preoccupied with the organisation of society and capitalism in order to direct economic activity towards satisfactory ways of life for all. This presupposes the end of laissez-faire policies and the start of a political economy that requires government to interfere with the competitive process of the market. In his *General Theory*, Keynes becomes more specific about this political economy that aims to mitigate rather unfair consequences of capitalism such as involuntary unemployment (Keynes, 2017).

Although neither Schumpeter nor Keynes wrote explicitly on the direction of innovation, contemporary theorists (Jacobs and Mazzucato, 2016; Mazzucato, 2014; Fagerberg et al, 2013; Block and Keller, 2011) tend to combine the politics of these thinkers in order to address the question of transformative change towards socially just and desirable outcomes. As Schot and Steinmueller (2018; 1561) framed it ‘For a decade now governments have recognised they may need to align social and environmental challenges better with innovation objectives. Climate change, reduction of inequality, poverty and pollution have been transformed into challenges and opportunities for science, technology and innovation policy’. To put it another way, the role of government is not just to facilitate economic development and correct market failures but more importantly to guide the direction of innovation towards addressing social and environmental challenges in a socially just way. In her *The Entrepreneurial State*, Mazzucato (2014: 24) explained that the state can play this role by investing ‘... in areas that the private sector would not invest even it had resources. And it is the courageous risk-taking visionary role of the state which has been ignored’. Areas of interest to social justice, including environment and health, require research and development (R&D) spending as well as risk-taking by the state in order to generate innovative solutions. Such solutions ought not to be privately appropriated (privatised). Contemporary theorists put forward two arguments against private appropriation of innovation. The first is that innovation as such is a collective process, often supported by public funds, and therefore rewards and risks ought to be equally shared by everyone. As Ziegler (2020: 45) points out ‘The idea of the heroic entrepreneur or heroic entrepreneurial organisation is ethically problematic if it legitimises a distribution of rewards that disregards contribution ...’. The second argument against private appropriation of innovation is that unequal distribution of rewards and risks of new technologies is not only morally disturbing but also unsustainable. According to Mazzucato (2018: 225) ‘... it is crucial to understand that innovation is not a neutral concept. It can be used for different purposes – in

the same way a hammer can be used to build a house or as a weapon'. Indeed, this conclusion is crucial for social justice. As Buchanan et al, 2011: 307) also stress 'Innovation is significant from the standpoint of justice because it can have either positive or negative effects. Depending on what is created and to whom it becomes available, innovation can worsen existing injustices or create new injustices, or it can lessen existing injustices'.

For contemporary theorists of innovation, whatever is created in terms of radical technologies involves some form of investment from the state. Therefore, the state is justified to direct these technologies towards addressing societal challenges for the benefit of taxpayers. Mission oriented innovation embodies the liberal idea of distributive justice 'as reciprocity' that is founded upon the principle of proportionality of contribution. Ziegler (2020: 79) formulated this principle in Rawlsian terms as follows: 'Innovation processes are to be arranged in such way that they distribute the gains from innovation according to contribution'. If, as Mazzucato argues, it is the state that makes the greatest contribution to innovation through investment in visionary new areas like AI, green and health technologies, then it is the state that should receive the greatest return for its citizens. For Mazzucato (2014; 2018) as well as for Block and Keller (2011) the historical fact that for many cutting-edge innovations it has not been the invisible hand of the market that has proven decisive but the visible hand of the state, generates duties of justice. Unless these duties are fulfilled, the direction of innovation remains morally questionable and politically problematic. Mazzucato (2018: 223) illustrates this by referring to the cases of Solyndra and Apple. As she says 'In 2009, Solyndra, a solar-power-panel start-up received a \$535 million guaranteed loan from the US Department of Energy; that same year Tesla, the electric car manufacturer, got approval for a similar loan of \$465 million. In the years afterwards Tesla was widely successful and the firm repaid its loan in 2013. Solyndra, by contrast filed for bankruptcy in 2011, and among fiscal conservatives became a byword for the government's sorry track record when it comes to picking winners. Of course, if the government is to act like a venture capitalist, it will necessarily encounter many failures while earning next to nothing from success. Taxpayers footed the bill for Solyndra's losses – yet got hardly any of Tesla's profits'. This is not a desired socially just outcome. On the contrary, it privatises the rewards of Tesla's innovation success and socialises the risks of Solyndra's innovation failure, excluding the state that invested high proportion of taxpayers' money into both companies. In the case of Tesla, a desired socially just outcome could have been possible if there was, for example, a share of patents that could ensure financial rewards (and a say on the use of patents) could flow into a 'national investment fund' for future investments in new technologies (Burlamqui, 2012, Mazzucato, 2014; Ziegler, 2015).

It is clear that the liberal idea of justice as reciprocity, underpinning the combined Schumpeterian-Keynesian politics of innovation, encourages 'just desert' attached to the proportionality of some hybrid of investment and risk. Although Mazzucato (2018: 222) is critical of the idea of 'just desert', one might argue that this is so only because she seems to misunderstand it as an individual entitlement and not as a collective one. Yet just desert can be applied to collectives through the state and that's in essence the implicit distributive justice argument that Mazzucato puts forward. On the basis of this argument, she wonders: 'Given the immense risks the taxpayer takes when the government invests in visionary new areas like the Internet, couldn't we construct ways for rewards from innovation to be just as social as the risks taken?' The answer appears to be straightforward positive from the perspective of justice in innovation as reciprocity. For many people, the more entrepreneurial the state becomes, the more it is justified to claim rewards from successful innovations for taxpayers. Such rewards can be regarded as the main currency of the combined Schumpeterian-Keynesian perspective

of justice as reciprocity. Deficiencies of rewards from successful innovations disadvantage the citizens of the entrepreneurial state who pay their taxes.

Although the liberal idea of justice in innovation as reciprocity appeals to many people who subscribe to the entrepreneurial state argument, the problem is that it leaves out of account those who have nothing to contribute to innovation process e.g., those who are disabled or people who don't pay taxes or individuals who abstain from any collective process of innovation and social co-operation. The question that arises is whether such people are owed anything by those who can contribute to innovation process and/or pay taxes. No obvious answer can be found in the writings of theorists who favour a combined Schumpeterian-Keynesian politics of innovation. This implies their favoured direction of innovation might end up not taking everyone's situation and interests into account in determining what is to count as a just outcome. Only those who contribute to innovation process through their entrepreneurial activity and/or through their taxes to the state will receive rewards. Yet even if everyone received equal rewards from innovation, this would not guarantee everyone would be in equal relations with each other in the process of generation and diffusion of new technologies. There would still be relational injustices such as domination by people who subscribe to certain types of scientific knowledge and refuse to decolonise their epistemologies and methodologies, and hierarchies due to status, and oppressions due to gender and culture.¹ However, social relations do not constitute a plausible currency of justice for the Schumpeterian-Keynesian theoretical camp. This camp is interested in proportionate distribution of rewards of innovation and that's what constitutes their currency of justice as reciprocity. In order to direct innovation towards outcomes of justice as reciprocity, the entrepreneurial state should focus on specific missions enabling the market to function or indeed create and shape new markets through investments in education, research, infrastructure, etc. (Mazzucato, 2021). To put it another way, it is the state and government which can stimulate improvements and distribute rewards (and risks) in a reciprocal way.

3. Hayekian Critique of Politics of Innovation Directionality

The combined Schumpeterian-Keynesian politics of innovation has been recently challenged by a number of thinkers who reconstruct Hayekian epistemological and moral arguments. Friedrich August Von Hayek is widely recognised as the founding father of neo-liberalism, influencing pro-market policies of deregulation, privatisation and reduction of social welfare (Papaioannou, 2012). Although he never explicitly wrote on innovation, he formulated an epistemologically founded critique of central economic planning and defended the neo-liberal idea of the market as a spontaneous order. In his work on *Collectivist Economic Planning* in 1935 and later in his *The Road to Serfdom* in 1944 and in his *Individualism and Economic Order* in 1948, Hayek argued for the impossibility of central economic planning, drawing on the socialist calculation debate (Gray, 1994)², and raising the issue of limited knowledge. For him, the knowledge required by policy makers to make central planning work would never be

¹ In addition, one might also argue that receiving rewards from innovation does not guarantee people would be equally capable of leading the kind of life they value. Sen (2009) would object the idea of justice in innovation as reciprocity on the grounds that it does not enable everyone contributing to innovation process to freely chose his/her functionings.

² Mises argued that socialism relies on a central economic planning that is impossible due to suppression of market pricing that can lead to calculation chaos.

assembled. Central planning is inefficient and ignores the role of market competition as a discovery procedure. It is this procedure that leads to innovation, involving individual entrepreneurs the actions of which produce unintended consequences, including new process and technological products. In the Hayekian perspective, innovation cannot be possibly planned and directed centrally by the state. This is due to limited knowledge of policy makers who are unable to understand the complexity of innovation process and the market institutions. All the state can end up doing is coercing entrepreneurs to move to specific directions and hence limiting their individual freedom. This creates a moral issue on top of the epistemological problem. In his *The Constitution of Liberty*, Hayek (1960: 12) conceives freedom as ‘an absence of coercion’. According to him, ‘By coercion we mean such a control of the environment or circumstances of a person by another that, in order to avoid greater evil, he is forced to act not according to a coherent plan of his own but to serve the ends of another’ (Ibid: 20-21). This conception is in line with Isaiah Berlin’s classical liberal notion of freedom as the absence of any ‘deliberate interference of other human beings within the area in which I could otherwise act’ (Berlin, 1975: 34). The area within which individual entrepreneurs act is the market that ought to be free in negative terms (free from state interference). Freedom implies that the state ought not to deprive individual entrepreneurs from pursuing their ideas by interfering and directing their innovations towards specific objectives and/or mission e.g., addressing societal challenges such as health, climate change, poverty and inequality.

In Hayek’s theory, liberal economic institutions such as the free market and the system of prices come about spontaneously as undesigned mechanisms of knowledge diffusion (that in many respects is tacit and individuals are not aware of having such knowledge). Clearly this theory has impact on the notion of innovation. If knowledge can be mainly generated through the engagement of individual entrepreneurs in the market, then innovation depends on the unintended consequences of market competition and not on state investment. In fact, the Hayekian perspective is that the state does not have any role to play in directing innovation towards social justice. Hayek’s *The Road to Serfdom* was an epistemological and moral critique of all forms of Keynesianism and collectivism which contemplated interference with the spontaneous order of the market (and inevitably, innovation). Hayek (1973: 36) defined order as ‘... a state of affairs in which a multiplicity of elements of various kinds are so related to each other that we may learn from our acquaintance with some spatial or temporal part of the whole to form correct expectations concerning the rest or at least expectations which have a good chance of proving correct’. This definition clearly raises the problem of knowing the whole of complex orders such as the market and the innovation process. Accepting spontaneity and uncertainty is Hayek’s solution to the epistemological and moral problem of state interference with these complex orders.

Contemporary theorists of innovation who question the combined Schumpeterian-Keynesian politics of the entrepreneurial state (Wennberg and Sandström, 2022; Davidson and Potts, 2022; Murtina et al, 2022; Mingardi, 2015) draw on this Hayekian definition of spontaneous order to warn us that ‘... what may sound good on paper in terms of collective missions and directionality are often – but not always – at odds with the received wisdom of individual action and co-ordination in open democratic societies’ (Wennberg and Sandström, 2022: 3). For them, such coordination ought to be within the spontaneous order of the market. Therefore, they accuse proponents of the combined Schumpeterian-Keynesian politics of innovation of ignoring the limits of human knowledge and the importance of spontaneity for co-ordination in open democratic societies. Defenders of Hayekian politics of innovation also dismiss the argument for the entrepreneurial state as partisan and shaky in terms of historical evidence. For instance, Worstall (2013) contests the entrepreneurial state argument on the grounds that

technological innovation is not a public good and therefore the government is not morally justified to interfere with the process through policies of research and development (R&D). In a similar manner, Mingardi (2015: 608) argues that ‘...in many respects it [the entrepreneurial state argument] suffers from the “is-ought” problem – that is, it makes too many claims about what we ought to be based on statements of what is’. He therefore accuses Schumpeterian-Keynesian theorists and especially Mazzucato, for developing arbitrary arguments, overemphasising ‘a tiny bit of history’ of the 20th century and failing to provide a holistic historical perspective, including the 19th century industrialisation that was independent of huge public investment in R&D. In short, Mingardi regards the entrepreneurial state theory as ideological and biased towards a strong public sector. However, analysing his argument, one might also brand it as ideological, suffering from exactly the same problem: lack of historical evidence. Mingardi’s only counter historical examples are focused on the Industrial Revolution e.g., railways, failing to accept the fact that involvement of the state has been key for setting up collaborative knowledge and innovation ecosystems that delivered new technologies as both intended and unintended consequences of industrial policy. Overemphasising the role of the market and dismissing the historical importance of state industrial policy are rather unconvincing strategies for defeating the combined Schumpeterian-Keynesian politics. Although it is true that this politics of innovation implies businesses take less risk than the state (Westlake, 2014) it is also true that the latter has more substantial involvement in early stages of technological invention than the former. As Block (2018: 29) suggests in his *Capitalism: The Future of an Illusion* ‘...within the parameters of an economy with private ownership and the pursuit of profitability, there is still very wide leeway to decide how large or small a role the state will play, how much inequality will be tolerated, and how deep and broad democratic governance will be’. Block’s suggestion is a response to Hayekians such as Mingardi who tend to see the market economy as being free, coherent and above all spontaneous order that has its own dynamics. This view of the market fails to understand the micro-level technology development and the role of the state policy in stimulating innovation. As Lall and Teubal (1998) point out, there is no such thing as a market order for setting priorities in technology. Visionary and strategic political choices have to be made by governments. As Ziegler (2020: 122) also notes ‘In spite of the evolutionary language often used in entrepreneurial research, innovation is not blind, natural force but something strategically pursued and fostered ...’ that can still have unintended consequences for people and the environment. For example, the strategic pursuit of technologies such as pesticides and fertilisers for the so-called Green Revolution had tremendous impact on soil and water quality, given that these chemicals have long-lasting effect on environment.

Hayekian theorists of innovation aim to leave governments out of the process of directing innovation towards addressing grand challenges from a justice perspective. One reason for that is the epistemological limitations of innovation policy. According to Sandström and Alm (2022: 235) ‘Generally, calls for increased directionality are made without limitations of policy or policy making. Evidence of policy failure is scarcely reviewed, yet there are, by now, many studies pointing out the limited effects of more interventionist policy approaches and support structures aiming to raise innovation summarised extant evidence on government interventions for innovation: “for each effective government intervention, there have been dozens, even hundreds, of failures where substantial public expenditures bore no fruit”. Sandström and Alm insist that only the discovery procedure of free competition can select stronger technologies through trial and error. This process is neutral and impartial, preventing the state from picking up winners. It might be argued that neutrality and impartiality are key pillars of the neo-liberal idea of justice in innovation underpinning Hayekian politics. Hayek himself called this idea of justice as ‘commutative justice’ that ‘...takes no account of personal or subjective

circumstances of needs or good intentions, but solely how the results of man's activities are valued by those who make use of them' (Hayek, 1967: 257). The Hayekian idea of commutative justice implies that only the impartial and neutral process of the market can deliver just outcomes in terms of distributing innovation rewards and risks. These rewards and risks are not merely resources to be distributed. As Ziegler (2020) points out, abstracting from relational rewards and risks conceals numerous directly justice-relevant questions about inequalities to be dealt with in the process of innovation. However, it is clear this idea of justice in innovation excludes those who are unable to participate in the competitive market process. From this it follows that the poor could never get the chance to value certain cutting-edge and expensive innovations because they could never get the chance to buy them and make use of them. But even if the poor could get the chance to buy and make use of such expensive innovations, they would not necessarily enter relations of equality with the rich due to issues of exploitation, domination, hierarchy and oppression which, sometimes, are independent of equal distribution of rewards of innovation. Imagine two persons (Person A=Female and Person B=Male) who receive the same reward for a successful innovation (e.g., a new digital technology). This equality cannot eliminate the possibility for a Person A to dominate and oppress Person B (and the reverse) because of non-economic factors in play (e.g., cultural and/or religious norms, exercise of physical or psychological power, etc.). These issues would persist unless a relational justice was in place to identify them in detail and then try to rectify them in non-ideal terms, directing innovation towards just outcomes. It might be argued that the neo-liberal idea of commutative justice in innovation that the Hayekians favour, tends to suffer from the same theoretical ills that the liberal idea of justice in innovation as reciprocity suffers i.e., overwhelmingly focuses on resources ignoring inequality of relations in the process of generation and diffusion of new technologies.

4. A Relational Approach to Directing Innovation towards Social Justice

As has been shown so far, despite differences, both the combined Schumpeterian-Keynesian and the Hayekian theoretical camps rely on liberal or neo-liberal notions of morality and politics which tend to justify predominantly distributive currencies of justice, overlooking questions of relational equality in the process of generation and diffusion of new technologies. Therefore, they fail to go far enough to eliminate unjust relations of domination, exploitation, oppression, and hierarchies within processes of production and diffusion of novel technologies and goods (e.g., IPRs). Such relations are in essence power relations i.e., relations of control of social actors over others (e.g., innovators, regulators, publics, etc.).

It might be argued that justice in innovation ought to be predominantly relational, not only distributive. A relational theory of social justice in innovation presupposes a level of equal distribution of risks and rewards that is not absolute and therefore allows for marginal profit incentives of entrepreneurship to be maintained. Although such incentives are not the only ones in play when it comes to major innovations based on scientific breakthroughs, this theory considers them to be important within market societies.

This theory of justice holds that each member of society ought to stand in equal relations to other members of society. It draws on proponents of social equalitarianism such as Anderson (1999, 2012) and Scheffler (2005, 2015) who have criticised the distributive notion of equalitarianism that holds that each member of society ought to enjoy equal share of the society's resources, including rewards of innovation. They have also defended a non-ideal notion of

relational justice. For example, Andersen (1999, 2010) has defended the view that normative theorising about justice cannot be founded upon philosophical constructions or indeed theoretical devices which are abstracted from historical facts. Instead, it can be founded upon empirically generated assumptions which succeed to pass a feasibility test i.e., a test conducted to provide evidence of whether a theory is feasible in real world. The aim of such theorising should be to mitigate current injustices through sustainable public policy instead of moving us from the current unjust state of the world to a perfectly just one (Volacu, 2018). Non-ideal theorists consider a perfectly just world to be empirically impossible.

Although a non-ideal theory of relational justice in innovation at first glance appears to be somewhat less ambitious than ideal theory, it takes on board issues of partial compliance with relational principles of justice and unfavourable circumstances in the innovation process. Anderson (2010) argues that ‘A system of principles that would produce a just world if they regulated the conduct of perfectly rational and just persons will not do so when we ask human beings, with all our limitations and flaws, to follow them’ (ibid: 3-4). It is such motivational and cognitive deficiencies in human beings which point towards the importance of empirical investigation and diagnosis of the underlying causes of relational injustices in innovation and then the development of a non-ideal theory that could provide concrete and sustainable policy solutions to problems. As Anderson (ibid: 6) puts it: ‘Non-ideal theory begins with a diagnosis of the problems and complains of our society and investigates how to overcome these problems. Non-ideal theory does not dispense with ideals but conceives of their function differently from ideal theory. In ideal theory, ideals function as standards of assessment for any society ... In non-ideal theory, ideals embody imagined solutions to identified problems in society’.

Non-ideal public policy solutions might be implemented or tried on the ground in order to deal with relational injustices. In this sense, non-ideal theory turns to be more effective in terms of implementing relational justice in empirically contingent circumstances. It can function as a set of hypotheses to be tested in real world. According to Anderson (ibid): ‘We test our ideals by putting them into practice and seeing whether they solve the problems for which they were devised, settle people’s reasonable complaints, and offer a way of life that people find superior to what they had before. If they pass the test, this does not validate them outside history. Circumstances change, and new problems and complaints arise, requiring the construction of new ideals. If our ideals fail the test, we need to revise or replace them’.

This constant testing of public policy and practice solutions to problems of social justice constitutes the main methodology of a non-ideal and relational approach. Instead of using ideals as standards of social and political assessment of relational injustices, this theory uses ideals as public policy reality tests.

Proponents of the competing approach of distributive equalitarianism such as Cohen (1989), Arneson (2004) and Dworkin (2000) have faced questions about their ideal principles of freedom and equality, as well as accusations of ignoring the politically oppressed, the relational inequalities of race, class and caste, and the victims of genocide and slavery (Anderson, 1999). These issues of injustice are at the heart of innovation. As such, innovation is about technological and social changes which create opportunities for addressing injustices but also pose risks of exacerbating them (Buchanan et al, 2011). According to social equalitarians, these risks are not a matter of undeserved bad luck (the impact of which needs to be eliminated) but rather a matter of unequal oppressive relations in society. It follows that the point of equality in innovation is not primarily distributional but relational. This implies that we start off with systematic identification of relational inequalities and then we move on to explain some of

them through identification of causes (e.g., distributional inequalities, gender biases, race discrimination, etc).

For innovation to embrace relations of equality, it must prevent people from entering superior-inferior relations in the process of knowledge generation, knowledge exploitation and technological change (Papaioannou, 2021). Such relations, whether they be marginalisation (e.g., of certain geographies in the Global South and/or excluded publics), hierarchy (e.g., scientists and technical experts versus practitioners), domination (e.g., scientific knowledge versus traditional knowledge) and exploitation (e.g., exploitative relations between companies and scientists), have no place in innovative communities of equals. As argued elsewhere, such communities are democratic in the sense that innovators regulators and users of technology are not in relations of hierarchy with one another, but in relations of equality. Relations of equality in innovation need to be protected from unjustified asymmetries of knowledge, undeserved inequalities of resources (e.g., unequal diffusion of benefits of innovation) deprivation of human capabilities, post-colonial dependencies and exclusions.

However, it needs to be stressed again that such relations of equality are not absolute. If there are justified asymmetries of knowledge (e.g., some persons make a choice to research more than others and therefore to generate more knowledge than others on specific topics of interest) and deserved inequalities of resources and capabilities (e.g., some persons make a choice to spend less resources on satisfying expensive tastes and instead invest more in developing their central capabilities), then relations of equality in innovation and development are relative. The question that arises is this: what is the threshold above which such distributional inequalities become morally unjustified and unacceptable for an innovative society of equals?

As an answer to this question, it might be argued that prioritising relational equality over distributional equality of resources in innovation implies that maximisation of profit is morally justified and accepted only so long as it does not cause minimisation of relational equality e.g., creating oppressive or exclusive relations between innovators, regulators, and publics. This proposed threshold is in line with Moles and Parr (2018) argument that, in fact, distributive egalitarianism and social egalitarianism are mutually supportive in a range of cases.

Indeed, in significant cases of innovation, the equalitarian ethos does not necessarily restrict the libertarian ethos and the reverse. Thus, for example, when it comes to elimination of poverty and hunger or to achievement of quality education and gender equality (SDGs 1-5) we have strong reasons to secure for each member of society equal share of basic resources in order to ensure each member of society stands the chance of escaping poverty, receiving equal level of quality education and taking equal opportunities regardless of gender, race, culture, etc. To put it another way, in almost all significant cases of innovation (e.g., the Internet, AI, green technologies, life sciences, etc), we have reasons to distribute resources simply because we have reasons to ensure certain relations between innovators, regulators and publics. As Moles and Parr (2019: 137) point out ‘... our concern for these kinds of relations also provides grounds upon which to object to highly unequal distributions of resources, even if no one is in particular badly off’. Highly unequal distribution of resources such as new technologies in sectors, including food, energy and medicines within countries, might be objected on the grounds of relational equality they cause.

Within countries, traditional Keynesian politics has tried to deal with such inequality through a conception of welfare state. Since the end of World War II, this modern state has funded an adequate education system, social insurance and pensions, public health care, etc. It has done

so through a particular mechanism of distributing resources (e.g., rewards of innovation), including income tax, corporation tax and value added tax (VAT). However, recent data (UNCTAD, 2021) reveals that within country inequality is on the rise again. This trend includes both developed countries such as the United States and the European Union and developing countries such as China and India. Although dominance of Hayekian politics promoting the market (as opposed redistribution of resources through the welfare state) is one part of the explanation of rising within country inequality, technological innovation is the other part. The installation and deployment periods of new technologies such as digital technologies, big data, robotics, AI, drones, and the Internet of Things (IoT) are uneven (Perez, 2002) generating winners and losers within countries. According to UNCTAD (2021) these technologies already represent a \$350-billion market and one that could grow to \$3.2 trillion by 2025. In order to deal with innovation-driven inequality some theorists and practitioners now propose to go beyond traditional welfare state policies and towards basic income distributive policies to equalise social relations affected by the digital revolution and other technological innovations (Plunkett, 2021). This proposal may be a good start but certainly not enough given the variety and depth of such inequalities. There is a need for identifying and explaining relational injustice as precise as possible first and then tailoring distribution of resources (including rewards of innovation) and other interventions (including education about respect and tolerance) in such way that can deliver just outcomes without disincentivising innovation. Dealing with relational injustice can only be a non-ideal process given the complexity of phenomena such as oppression, domination and hierarchies, and the lack of perfect distributional and non-distributional solutions.

In order to establish equal relations within countries, distributional inequality of resources should be limited to morally acceptable threshold. The morally acceptable threshold of distributional inequality of resources (e.g., rewards of innovation) is a threshold that does not cause unequal relations of domination and oppression within and between countries. To paraphrase Rawls infamous difference principle: *distributional inequalities are just if and only if they're part of an arrangement that maintains relations of equality between all members of society*. To put it another way, the legitimation of marginal distributional inequality of resources such as rewards of innovation, depends on the extent to which this maintains relations of equality between all members of society, including the innovators, the regulators, and the publics. Increase of distributional inequality above the threshold leads to creation of unequal relations of domination, oppression, and exploitation between people. Therefore, distributional inequality ceases to be marginal and no longer constitutes an incentive of innovation. It's at this point that the state is morally justified to intervene to rectify relational justice through reduction of distributional inequality to a morally acceptable threshold.

Innovation can be politically directed towards social justice provided politics adopts what I outlined as relational theory of justice. This theory accepts that a marginal threshold of distributional inequality of resources can incentivise the profit drive of innovation without jeopardising equality of relations. No other inequality is justified in innovation. Narratives about innovators taking high risks and therefore deserving high rewards are not in line with the relational justice in innovation outlined above.

Now the question that arises is what sort of politics can direct innovation towards delivering just outcomes from a relational perspective, given the inability of Schumpeterian-Keynesian politics and Hayekian politics to move beyond distributional concerns about innovation. In previous works (Papaioannou, 2018, 2016, 2014) I have argued that state politics is not necessarily the best way to achieve directionality in innovation. This is not only because of

capacity and legitimacy issues of states but also because of the fact that, as a recent UNRISD (2022: 14) report points out, ‘There are sufficient data to suggest that political systems bent towards the preferences of elites ... Elites wield influence over policies and legislation through various strategies, including influencing the electoral process through business networks and lobbying, media control or outright state capture’. UNRISD in essence confirms Wright’s recent diagnosis and critique of capitalist democracy that, according to him, it is unable ‘... to insulate political decision-making from the exercise of power connected to capitalist wealth’ (Wright, 2012: 7).

This implies, for example, that an entrepreneurial state intending for Schumpeterian-Keynesian politics can be easily hijacked by lobbying groups representing the narrow interests of multinational companies (e.g., energy giants, big pharmaceuticals, etc.) and directing innovation towards unjust outcomes. More transparency and participation regarding the decisions of entrepreneurial state would be possible with greater engagement of publics. The conditions of such engagement include: education, time and resources. Yet the entrepreneurial state appears to be centralised and unable to meet transparency and participatory requirements of innovation (Papaioannou, 2021). Indeed, as Ziegler (2020: 83) notes ‘These transparency and participatory requirements might slow-down the pace of change, but if the reason for the slow-down is greater consideration with a view to improving benefits to the least advantaged, then the slow-down in such cases is part of innovation for justice’. In fact, lack of transparency and participatory governance can open the door to an authoritarian entrepreneurial state (Papaioannou, 2021) that can potentially shut down bottom-up (pluralist) innovation alternatives to illegitimate missions. Mazzucato (2021) defends the role of the entrepreneurial state in making bets and picking winners and directions of innovation which promise to accomplish specific missions. However, this top-down political approach can potentially suppress bottom-up alternatives. Centralised states and their missions have historically been vulnerable to failures of democratic accountability. Their exercise of state power could not be subordinated to power of civil societies. There is no reason why the entrepreneurial state would be an exemption to this historical legacy of centralised states within capitalism.

Instead of state politics, I have suggested that public action and campaigning for just innovation can push for the rectification of relational injustices, ensuring directionality of technologies that is morally acceptable. The politics of public action and campaigning is predominantly bottom up, involving participation of various marginalised groups. Take for example, public actions and campaigns for the so-called grassroots or below the radar innovation. These are actions and campaigns by low-and-middle income groups which draw on indigenous knowledge to introduce low tech innovations which tend to equalise social relations within communities. For example, the introduction of a low-cost prosthetic leg to poor persons facing disability enables them to relate more equally to others and their communities, participating in activities they would not be able to participate otherwise. The introduction of micro-credit options to the bottom of the pyramid (BoP) of global income distribution (i.e., the income-poor) challenges the dominant idea of banking that is exclusive of the income-poor and improves equality in terms of relations with non-income poor (i.e., middle-and-high people). The same holds for other grassroots innovations ranging from community support agriculture and eco-housing to complementary currencies and credit unions (Smith and Sterling, 2018). The common denominator of public actions and campaigns for grassroots or below the radar innovations is their counter-hegemonic character. Such actions and campaigns are very much political, challenging domination by powerful market companies, putting forwards an alternative direction of innovation and towards freedom and sustainability. According to UNRISD (2022: 25) ‘New forms of collaboration are emerging among marginalised groups as

the apply various strategies to adapt to rapidly changing environments while stabilising their livelihoods. They develop innovative strategies to increase their capital base for investments ... or co-produce social services as a way to change their relations with state and market providers, for example, in the case of informal workers in India and Thailand'. Indeed, UNRISD research confirms that the politics of public action and campaigning, inspired by ideas of relational justice and common good, putting pressure from below, can go long way toward more just and sustainable approaches (ibid.). Such approaches embrace pluralism of innovative activity across a variety market and non-market contexts. This implies a direction towards what Wright (2010, 2012) theorised as 'real utopias' namely bottom-up configurations of innovation which are facilitated by politics of collective agency to deliver just outcomes.

Unequal social relations through which people marginalise others can be changed through this politics of collective agency, including campaigns and public actions of grassroots innovation movements (Smith et al, 2017). A non-ideal theory of justice in innovation should subscribe to pragmatism in line with politics of public action to enable transformative change. Public action as such emerges when empirical identification and causal explanation of injustice raises the question of '... what can and ought to be done about it, and who should be charged with correcting it' (Anderson, 2010: 22). Indeed, as Harvey (1992) also points out, social mobilization and organisation are driven by bottom-up claims of social justice. Such claims are relational (not just distributional) and require both evaluation and attribution of political responsibility for change (ibid). In terms of evaluation, it might be argued that judgements about relational injustices in innovation can be based on normative reflections which are both historically and socially contextualised. This is what Young (1990: 5) regards as 'critical theory'. In her view, 'Critical theory presumes that normative ideals used to criticise society are rooted in experience of and reflection on that very society, and that norms can come from nowhere else'. Young's critical theory and Anderson's non-ideal theory converge in their understanding of normative principles of justice as bottom-up developments of public action. Young (2001: 672-673) describes the typical public activist as someone who '... is committed to social justice and normative value and the idea that politically responsible persons ought to take positive action to promote these. He also believes that the normal workings of the social, economic, and political institutions in which he dwells enact or reproduce deep wrongs – some laws or policies have unjust effects or social and economic structures cause injustice, or non-human animals and things are wrongly endangered and so on ... Besides being motivated by a passion for justice the activist is often propelled by anger or frustration at what judges to be the intransigence of people in power in existing institutions who behave with arrogance and indifference towards injustices the activist find they perpetuate'. By contesting relations of power, domination and oppression, public activists generate egalitarian principles of justice in innovation which are not necessarily liberal and tend to go beyond distribution of benefits of innovation and towards equalisation of social relations.

5. Conclusion

This paper has sought to evaluate two political approaches to innovation directionality towards just outcomes. On the one hand, a combined Schumpeterian-Keynesian politics that puts forward the idea of justice in innovation as reciprocity; namely people deserve just rewards from successful innovations according to the proportion of their contribution to innovation processes. On the other hand, a Hayekian politics that puts forward the idea of justice in innovation as a commutative process: namely people deserve to receive rewards from successful innovations on the grounds of how the free market values their innovative activities. I have argued that both approaches to directionality of innovation are predominantly liberal

and distributional, failing to appreciate the primacy of relational justice. Therefore, they also fail to eliminate oppressive relations and hierarchies in the process of generation and diffusion of new technologies. I have insisted that in order for innovation to be directed towards just outcomes, our approach should be relational. This implies that we ought to prioritise relational equality over equality of resources. Of course, certain level of equality of resources is presupposed of equality of relations. However, equality of resources cannot be absolute but relative to its impact on equality of relations. This leaves us with some space for inequality in innovation so long as it does not cause unequal relations of domination and oppression in the generation and diffusion of new technologies.

References

- Anderson, E. (2010) *The Imperative of Integration*, Princeton, NJ: Princeton University Press.
- Berlin, I. (1975) 'Two concepts of Liberty' in D. Miller (ed.) *Liberty*, Oxford: Oxford University Press.
- Block, F. and Keller, M. R. (2011) *State of Innovation: the U.S. Government's Role in Technology Development*, London: Paradigm Publishers.
- Burlamaqui, L. (2012) 'Knowledge Governance: An Analytical Perspective and its Policy Implications' in L. Burlamaqui, A. Castro and R. Kattel (eds) *Knowledge Governance: Reasserting the Public Interest*, London: Anthem Press.
- Davidson, S. and Potts, J. (2022) 'The Entrepreneurial State and the Platform Economy' in C. Wennberg and C. Sandström (eds) *Questioning the Entrepreneurial State: Status-Quo, Pitfalls and the Need for Credible Innovation Policy*, Cham: Springer.
- Fagerberg, J., Martin, B., and Sloth Andersen, E. (2013) *Innovation Studies: Evolution and Future Challenges*, Oxford: Oxford University Press.
- Harvey, D. (1992) 'Social Justice, Postmodernism and the City' *International Journal of Urban and Regional Research*, Vol.16, No.4., pp.588-601.
- Hayek, F. A. (1944) *The Road to Serfdom*, London: Routledge.
- Hayek, F. A. (1948) *Individualism and Economic Order*, South Bend Indiana: Gateway Editions, Ltd.
- Hayek, F. A. (1967) *Studies in Philosophy, Politics and Economics*, London: Routledge & Kegan Paul.
- Hayek, F. A. (1973) *Law, Legislation and Liberty*, Vol.I, London: Routledge & Kegan Paul.
- Jacobs, M. and Mazzucato, M. (2016) (eds) *Rethinking Capitalism: Economics and Policy for Sustainable and Inclusive Growth*, Chichester: Blackwell Publishing.

Keynes, J. M. (2013) 'The End of Laissez-Faire' in the *Collected Writings of John Maynard Keynes IX Essays in Persuasion*, Cambridge: Cambridge University Press, pp.272-294.

Keynes, J. M. (2017) *The General Theory of Employment, Interest and Money*, Ware: Wordsworth Editions Limited.

Mazzucato, M. (2014) *The Entrepreneurial State: Debunking Public Vs Private Sector Myths*, London: Anthem Press.

Mazzucato, M. (2021) *Mission Economy: A Moonshot Guide to Changing Capitalism*, Milton Keynes: Allen Lane, Penguin.

Mingardi, A. (2015) 'A Critique of Mazzucato's Entrepreneurial State' *Cato Journal*, Vol.35, No.3, pp.603-625.

Murtinu, S. Foss, N. and Klein, P. G. (2022) 'The Entrepreneurial State: An Ownership Competence Perspective' in C. Wennberg and C. Sandström (eds) *Questioning the Entrepreneurial State: Status-Quo, Pitfalls and the Need for Credible Innovation Policy*, Cham: Springer.

Papaioannou, T. (2012) *Reading Hayek in the 21st Century*, London and New York: Palgrave Macmillan.

Papaioannou, T. (2014) 'Innovation and Development in Search of a Political Theory of Justice' *International Journal of Technology and Globalisation*, Vol.7, No.3, pp.179-202.

Papaioannou, T. (2016) 'Sen and Marx on Incentives and Justice: Implications for Innovation and Development' *Progress in Development Studies*, Vol.16, No.4, pp.1-17.

Papaioannou, T. (2018) *Inclusive Innovation for Development*, London: Routledge.

Papaioannou, T. (2021) 'Creative States: is State-led Risk-taking the Answer to Post-Covid-19 Recovery?' *RSA Journal*, Vol.5584, No. 1, pp.30-35.

Perez, C. (2002) *Technological Revolutions and Financial Capital: the Dynamics of Bubbles and Golden Ages*, Cheltenham: Edward Elgar.

Sandström, C. and Alm, C. (2022) 'Directionality in Innovation Policy and the Ongoing Failure of Green Deals: Evidence from Biogas, Bio-ethanol, and Fossil Free Steel' in C. Wennberg and C. Sandström (eds) *Questioning the Entrepreneurial State: Status-Quo, Pitfalls and the Need for Credible Innovation Policy*, Cham: Springer.

Schumpeter, J. A. (2010) *Capitalism, Socialism and Democracy*, London and New York: Routledge.

Sen, A. K. (2009) *The idea of Justice*. London: Penguin.

Smith, A. and Stirling, A. (2018) 'Innovation, Sustainability and Democracy: An Analysis of Grassroots Contribution' *Journal of Self-Governance and Management Economics*, Vol.6, No.1, pp.64-97

Smith, A., Fressoli, M., Abrol, D., Arond, E., and Ely, A. (2017) *Grassroots Innovation Movements: Pathways to Sustainability*, Abingdon and New York: Routledge.

UNRISD (2022) *Crises of Inequality: Shifting Power for a New Eco-Social Contract*, Geneva: UNRISD: <https://www.unrisd.org/en/library/publications/crises-of-inequality>

Wennberg, K. and Sandström, C. (2022) (eds) *Questioning the Entrepreneurial State: Status-Quo, Pitfalls and the Need for Credible Innovation Policy*, Cham: Springer.

Wennberg, K. and Sandström, C. (2022) 'Introduction' in C. Wennberg and C. Sandström (eds) *Questioning the Entrepreneurial State: Status-Quo, Pitfalls and the Need for Credible Innovation Policy*, Cham: Springer.

Wright, E. O. (2012) 'Transforming Capitalism through Real Utopias' *American Sociological Review*, Vol. 78, No.1, pp.1-25.

Wright, E. O. (2010) *Envisioning Real Utopias*, New York: Verso.

Worstell, T. (2013) 'The Intellectual Hole at the Heart of Mariana Mazzucato's Entrepreneurial State' *Forbes*: <https://www.forbes.com/sites/timworstell/2013/12/15/the-intellectual-hole-at-the-heart-of-mariana-mazzucatos-entrepreneurial-state/>

Young, I. M. (2001) 'Activist Challenges to Deliberative Democracy' *Political Theory*, Vol.29, pp.670-690.

Ziegler, R. (2020) *Innovation Ethics and our Common Futures*, Cheltenham and Northampton MA: Edward Elgar.

Ziegler, R. (2015) 'Justice and Innovation: Towards Principles for Creating a Fair Space for Innovation' *Journal of Responsible Innovation*, Vol.2, No.1, pp.184-200.