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in Human Development**

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Abstract

This paper analyzes the theoretical and empirical links between inequality in human development on the one hand and sustainability on the other. It specifically looks at causality in both directions. Inequality in various dimensions of human development is analyzed with respect to both weak and strong sustainability, where weak sustainability presumes substitutability among different forms of capital, while strong sustainability reject substitutability and calls for preservation of so-called critical forms of natural capital independent of the amount of investment into other forms of capital.

Keywords: Inequality, human development, sustainability, natural capital, environment.

JEL classification: I31, Q01

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Of all the competing and only partially reconcilable ends that we might seek, the reduction of inequality must come first. Under conditions of endemic inequality, all other desirable goals become hard to achieve.

(Judt 2010: 184)

1. INTRODUCTION

Many academics and public intellectuals have recently voiced grave concern about increasing inequality and its detrimental social effects, not least by slowly destroying the “social fabric” and public spirit on which the private and public welfare of all societies are built (e.g., Judt 2010; Turner 2010). This paper analyzes the links between inequality in human development on the one hand and sustainability on the other. It specifically looks at causality in both directions. As it turns out, there are many reasons why more inequality would lead to more unsustainability and why more unsustainability would cause more inequality in human development, both within and between countries. In other words, there is likely to exist a vicious circle between inequality and unsustainability, where more of one will cause more of the other, in turn causing more of the former and so on. These causal links may take time to materialize and may thus not become easily visible, but that does not mean they do not exist.

What these bi-directional causal links in turn imply is that those concerned about inequality in human development would be ill advised to neglect the challenge of sustainability, while those concerned about sustainability would be ill advised to neglect the challenge of inequality in human development. Not only would it be morally wrong to give priority to one challenge over the other, this paper argues it would also be analytically wrong to do so and would therefore lead to wrong and self-defeating policy recommendations.

Enabling everyone to be capable and free to do things and be the person they want to be is the goal of human development (Haq 1995; Sen 1999; Nussbaum 2000; UNDP 2006: 2). Inequality in human development is then essentially inequality in such capability and freedom. Such capability and freedom will be determined by many things, but for the purpose of this paper and in accordance with the UNDP's Human Development Index, I will look at income, education and health as three of the most important determinants. Inequality in human development is then inequality in individual educational levels, health standards and incomes in any given country and in average levels, standards and incomes between countries.

The definition of sustainability employed here is based on the so-called capital approach to sustainable development, in which the aim is to make sure that future generations have at least the same value of capital available to allow them attaining at least the same level of utility as the current generation. Scholars typically distinguish four types of capital: natural, man-made, human and social capital. Natural capital encompasses everything in nature that provides human beings with well-being, from natural resources to environmental amenities and the pollution absorptive capacity of the environment. Man-made or manufactured capital refers to the physical means of production (factories, machineries etc.) and infrastructure. Human capital covers knowledge and skills. Social capital is more tricky to define, but typically refers to things like trust among individuals and trust in the institutions that govern their lives and the quality of these institutions.

Sustainability proponents can be roughly divided, for analytical purposes, into those adhering more to a weak and those adhering more to a strong sustainability paradigm (Neumayer 2010a). Weak sustainability (WS) is built on the assumption that natural and other forms of capital are essentially substitutable and that the only thing that matters is the total value of capital

stock, which should be at least maintained or ideally added to for the sake of future generations. Hence, weak sustainability is about saving (investing) enough for the sake of future generations. Strong sustainability (SS) rejects the notion of substitutability (of natural capital) and holds that certain forms of natural capital are critical and that their depletion cannot be compensated for by investment into other forms of capital, such as man-made (manufactured) and human capital. Like weak sustainability, it calls for saving (investing) enough for the sake of future generations, but the accumulation of other forms of capital must not come at the expense of deteriorating or depleting critical forms of natural capital.

I have argued elsewhere that existing empirical evidence appears to support the non-substitutability assumption of SS more strongly with respect to the role natural capital plays in absorbing pollution and providing direct utility in the form of environmental amenities, whereas empirical evidence appears to support the substitutability assumption of WS with respect to natural capital as a resource input into the production of consumption goods (Neumayer 2010, chapter 4). Ironically, because weak sustainability is more relevant for the “source” side of the economy, economies can continue to grow to a scale and at a speed that threatens the ability of natural capital to absorb pollution and provide environmental amenities, rendering strong sustainability more relevant for the “sink” side of the economy. Since it is mainly the pollution absorptive capacity of the environment and the provision of direct environmental amenities such as forests, nature parks, wetlands etc. people have in mind when they refer to “the environment”, strong sustainability is arguably the paradigm requiring relatively more attention. The links between inequality in human development and strong sustainability will therefore be given somewhat more consideration here than the links between inequality and weak sustainability.

The remainder of this paper is structured as follows: Section 2 addresses the first arrow of causation from inequality in human development on sustainability, distinguishing between weak and strong sustainability and between within and between-country inequality, respectively. Section 3 analyzes the reverse causality from (un)sustainability to inequality in human development, employing the same set of analytical distinctions. Section 4 concludes.

2. IMPACT OF INEQUALITY IN HUMAN DEVELOPMENT ON SUSTAINABILITY

This section will look at the effect of inequality in human development on weak and strong sustainability. I start with within-country inequality, then turn to between-country inequality.

2.1 Effects of within-country inequality

2.1.1 Weak sustainability: Savings and investment

Weak sustainability is essentially about saving (investing) enough for future generations. How does within-country inequality in human development affect the saving rate of nations? Would more inequality raise or lower the domestic savings rate? As far as individuals' decisions are concerned, the answer depends on the marginal propensity to save (MPS) of the well-off versus the poorly-off. If the MPS of the former exceeds the MPS of the latter, then more inequality can lead to more savings for the benefit of future generations.

Starting with inequality in incomes, would a more unequal income distribution raise the savings rate? This is likely for savings/investment in man-made capital as the rich are likely to save a higher margin of an additional dollar than the poor who have more pressing consumption needs. It is far less likely for savings/investment in human capital. The rich are likely to be well-educated already anyway, whereas taking further money away from the poor will lower their

educational spending. On the whole, investment in human capital is therefore likely to decrease with more income inequality. As concerns social capital, more income inequality, at least beyond a certain level of inequality, is likely to lead to a loss of social capital as more inequality threatens the “social fabric” of societies as the very poor feel disenfranchised and envious of the extra-ordinary wealth accumulated by the very rich. There is also some evidence that more income inequality leads to more violent crime (even if the evidence does not uphold in a country fixed effects model specification, see Neumayer 2005). There is quite plausibly a causal relationship between the very large and very conspicuous degrees of income inequality in, say, São Paulo, Rio de Janeiro, Johannesburg and other mega-cities in the developing world and the extreme rates of violent crime found there. One of the links to sustainability is that violent crime is a sure destroyer of social capital. As concerns natural capital, the effect of inequality is similar to the effect on strong sustainability and is therefore discussed in section 2.1.2.

More income inequality may thus be good for savings/investment in man-made capital, but is likely to be bad for other forms of capital. What about inequality in other aspects of human development? Would a more unequal distribution in health raise the savings rate? Definitely not. Debilitation as a consequence of poor health conditions is known to lead to economic unproductiveness, as the case of Malaria and other infectious diseases demonstrates. Would a more unequal distribution in education levels raise the savings rate? Most likely not either. Broad and evenly distributed levels of education are likely to boost the economy and thereby raise the national savings rate as richer countries tend to have higher savings rates than poorer countries (World Bank 2011). The only condition under which more inequality in education levels might be beneficial for savings/investment is if the country cannot afford good education for all and therefore invests in very good education for the selected few, thus leading to more inequality, in

order to have a sufficient number of highly educated people to run crucial sectors of the economy and government. Whilst the same argument could in principle apply to health as well, to be productive only requires good health, whereas to perform certain tasks in crucial sectors of the economy and government may require levels of education that are built up over many years and may require being educated abroad, which many countries are probably too poor to provide for more than the selected few.

In addition to private individuals' decisions, a country's savings rate is also affected by public policies. More inequality is likely to have a negative impact on public policies aimed at raising the domestic savings rate, e.g. in the form of higher public educational expenditures. The reason is that the relatively well-off can inevitably receive higher private benefits from private investments than they can from public investments typically paid for by some form of progressive taxation. For example, private schools are of course expensive, but are likely to promise the well-off better education for their offspring than if they had to finance a public school system that provided every school-child with similarly high levels of education. The same argument would apply for private health care relative to public health care.

2.1.2 Strong sustainability: Preserving critical forms of natural capital

Strong sustainability is essentially about preserving so-called critical forms of natural capital, i.e. forms of natural capital that are either non-substitutable by other forms of natural capital or that human beings wish to preserve in order to bequeath them to future generations. Naturally, there will be controversy about what constitutes *critical* forms of natural capital, but example candidates encompass the global climate, biodiversity, forests and wetlands, food and water resources as well as the pollution absorptive capacity of the environment (Neumayer 2010a). In

contrast, mineral and fossil fuel reserves are unlikely to be critical in the sense of being non-substitutable by other resources or other forms of capital.

The direct effect of inequality on strong sustainability is somewhat unclear, but probably small compared to the indirect political economy effects on public decision-making. The direct effect depends on the net marginal propensity to save (MPS) the environment (the marginal propensity to save minus the marginal propensity to destroy the environment) of the well-off versus the poorly-off. If the MPS of the former exceeds the MPS of the latter, then more inequality can lead to more savings for the benefit of future generations.

Starting again with inequality in incomes, would a more unequal income distribution raise the net MPS the environment? More inequality could render some individuals, particularly in poorer countries, so poorly off that they have little alternative but to infringe on critical forms of capital – for example, by slash-and-burn agriculture on marginal forest land in order to make a living as a farmer. On the other hand, more inequality could spur private contributions to save the environment. For the same reasons that more income inequality might raise the aggregate savings rate, it might also raise the aggregate willingness-to-pay to, for example, preserve endangered species.

As regards inequality in education, a poor understanding of the value of critical forms of natural capital and the reasons for its preservation are likely to be detrimental to strong sustainability. In as much as more inequality in educational levels would leave large parts of the population without the required capability to understand and appreciate critical natural capital, it would be detrimental to strong sustainability.

Much more important than the direct effect of inequality on private decision-making, are the indirect effects on the political economy of public decision-making. The most basic of

inequalities exists between those who have a say in such decision-making and those who do not. Whereas in democracies there is in principle equality among citizens in that everyone can influence decision-making equally (even if the reality is very different, see below), inequality is the fundamental principle on which autocracies are based: a small ruling elite decides, leaving the vast majority without a say in public matters.

There are many reasons why one would expect democracies to preserve better critical forms of natural capital (Payne 1995; Neumayer 2001): in democracies citizens are better informed about environmental problems (freedom of press) and can better express their environmental concerns and demands (freedom of speech), which will facilitate an organization of environmental interests (freedom of association), which will in turn put pressure on politicians operating in a competitive political system to respond positively to these demands (freedom of vote), both domestically as well as via international cooperation. In non-democratic systems, on the other hand, governments are likely to restrict the access of their population to information, restrict the voicing of concerns and demands, restrict the organization of environmental civil society groups and isolate themselves from the citizens' preferences. In other words, in democracies if citizens are concerned about environmental problems this will eventually require policy makers to exhibit stronger environmental action to address these concerns and satisfy the demand for environmental protection measures.

Moreover, the small ruling elite in autocracies is likely to control the highly polluting industries as well, thus disproportionately benefiting from externalizing environmental costs. It has thus little interest in environmental pollution control, not least because the accumulated wealth that comes with political control allows them to buy themselves private environmental amenities (for example, residential properties far away from the sources of pollution), such that

they do not fall victim to the degradation of public environmental amenities that is the consequence of their own environmental cost externalizing. A wide range of studies confirms that democracies out-perform autocracies in terms of environmental commitment (such as the signing of multilateral environmental agreements) and environmental outcomes (see, for example, Torras and Boyce 1998, Barrett and Graddy 2000, Neumayer 2002, Li and Reuveny 2006; Farzin and Bond 2006; Bernauer and Koubi 2009, Bättig and Bernauer 2009).

Democracies provide equal rights to all citizens, but this does not translate into equal influence on public decision-making. Inequality in incomes and education levels will systematically bias decisions against the preservation of critical forms of capital (Boyce 1994, 2002, 2003, 2007, 2008). The benefits from environmental pollution tend to be concentrated toward the upper end of the income distribution, as relatively well-off shareholders benefit from higher profits following environmental cost externalization and high-consumption richer individuals benefit from higher consumer surplus. In contrast, the costs of environmental pollution tend to be concentrated toward the lower end of the income distribution, as poor people often do not have the resources to shield themselves against environmental pollution by buying private environmental amenities, as the relatively rich can do. Increased economic inequality will therefore lower aggregate willingness-to-pay for environmental policies, unless the income elasticity of demand for environmental protection – typically presumed to be positive, possibly even above one – is so strong as to outweigh the “price effect” arising from foregone extra profits and consumer surplus from environmental cost externalization (Scruggs 1998; Boyce 2003). The latter is unlikely, however, given that relatively wealthy individuals benefiting from such cost externalization can substitute private environmental amenities for public ones or can spatially distance themselves from pollution hotspots by buying residential property in relatively

unaffected areas. For example, in São Paulo it is a common phenomenon for very rich people to live well outside the megalopolis with its polluted air and congested streets and to fly into the city for work and leisure purposes with private or chartered helicopters. Finally, in as much as concentrated economic power also allows a greater influence on political decision-making, greater inequality will also bias political decision-making against environmental protection. Thus, differences in ability-to-pay buy differences in political power to influence decisions.

What if environmental protection is not achieved by public policies, but by the voluntary provision of public goods by individuals? Even if wealthy people voluntarily contribute more to public goods in general than poor people, as Olson (1965) and Scruggs (1998) suggest, this does not mean that shifting money from the poor to the wealthy would lead to more public goods (Baland and Platteau 1997). More importantly, more inequality would not lead to stronger public good environmental policies, given that these go against the interests of the relatively wealthy.

There is a range of studies confirming the negative impact of income inequality on environmental policies and outcomes (see, for example, Torras and Boyce 1998; Boyce et al. 1999; Magnani 2000; Koop and Tole 2001; Holland, Peterson and Gonzalez 2008; Vornovytsky and Boyce 2010). These studies have to be treated with some caution. Inequality is likely to be correlated with country-specific factors such as resource endowments, culture, climatic conditions etc. that do not vary over time or vary only little. Ideally, one would control for these factors by including country fixed effects into the model specification. To my knowledge, none of the studies referred to above does this. The reason is presumably that inequality is rather “sticky” and therefore has little time variation itself and is measured with

great uncertainty (Atkinson and Brandolini 2001; Boyce 2003), rendering an estimation of its effect in a country fixed effects model rather inefficient.¹

What is true for income inequality will hold true for inequality in education and health as well. Less educated and less healthy individuals will find it more difficult to actively participate in the political process of public decision-making. Given that environmental pollution is likely to be concentrated where poorly educated and unhealthy people live, this implies that victims of pollution will have less say in public policies.

2.2 Effects of between-country inequality

2.2.1 Weak sustainability: Savings and investment

The effects of between-country inequality in human development on weak sustainability are likely to be modest. After all, each country can decide how much of its income it wishes to consume as opposed to save. True, less well off countries find it more difficult to save a sufficient portion of their income for the benefit of future generations (World Bank 2011), but this refers to absolute levels of human development, rather than inequality per se. However, to the extent that given currently existing levels of human development of countries more between-country inequality would mean more countries with low to very low absolute levels of human development (see the discussion on this in the next sub-section), the effect of greater between-

¹ It is noteworthy in this respect that the statistical evidence for an effect of income inequality on violent crime disappears once country fixed effects are included (Neumayer 2005). The same is likely to be the case if country fixed effects were included in studies estimating the impact of inequality on the environment. Of course, a country fixed effects specification need not kill off any significant effect of income inequality – Forbes (2000) finds a significant positive effect of inequality on short- to medium-term future economic growth in such a specification.

inequality on weak sustainability is likely to be negative as more countries would struggle to save/invest enough for the future.

2.2.2 Strong sustainability: Global public goods and international cooperation

The effects of between-country inequality in human development are likely to be more pronounced on strong sustainability than on weak sustainability. Critical forms of natural capital such as the global climate, forest resources, biodiversity etc. are typically global public goods. Individual countries cannot achieve them on their own without the cooperation of other countries. For example, if Brazil started to aggressively protect its tropical rainforest, this would not fully preserve this critical form of natural if the Democratic Republic of Congo, Indonesia and other places with remaining tropical rainforests allowed their forests to be converted into agricultural land or infrastructure.

The effect of greater inequality on strong sustainability is likely to be negative. Start with income inequality. The more unequal the per capita incomes of countries the more difficult, all other things equal, the successful conclusion of multilateral environmental agreements (MEAs) will be. The reason is that the relatively poor countries will have more pressing concerns high up on their priority list. They will be thus reluctant to engage in costly environmental protection measures, unless compensated for by the richer countries. The richer countries have a limited willingness to compensate poorer countries though, in part because they are concerned whether their transfer payments will actually achieve the MEA objectives or will be dis-appropriated by recipient countries for other purposes, including for private gain (corruption). The end result is that MEA negotiations are difficult to resolve successfully – witness the seemingly never-ending saga of concluding a meaningful post-Kyoto agreement on climate change. In addition to the

argument made above, there is some evidence from field experiments that demonstrate that more inequality among individuals renders agreement on public goods more difficult, presumably because more inequality focuses the minds of many on the fairness of the outcome rather than on what the outcome achieves in terms of public goods provision (Tavoni et al. 2011).

The effect of greater inequality in health is similar to the effects of inequality in income. Countries faced with severe health crises (e.g. countries with a very high prevalence of HIV/AIDS as faced by countries in Sub-Saharan Africa) will have much more pressing concerns high on their agenda than preserving critical forms of natural capital. The effect of greater inequality in education is similarly negative. In addition to the issue of what gets prioritized in public decision-making, negotiating and concluding MEAs requires significant human capital by negotiating partners and, if anything, the educational requirements for successfully delivering on the agreed-upon outcomes are even higher. That many developing countries face severe problems in complying with MEAs and enforcing them is for the most part not so much the consequence of unwillingness, but of missing capacity, of which lack of human capital represents an important part (Neumayer 2001).

Of course, all the arguments made above presume that the relatively poorly off are in some sense also likely to be poorly off in absolute terms. This is likely given the current context in which nation-states operate. If mean absolute levels in income, education and health were extremely high, then inequality would not really matter much. However, in the current world in which mean per capita income levels of many countries are still very low as are their levels of educational attainment and, if perhaps less so, health, more between-country inequality will inevitably have the negative impact on strong sustainability discussed above.

3. IMPACT OF UNSUSTAINABILITY ON INEQUALITY IN HUMAN DEVELOPMENT

This section analyzes the reverse impact that unsustainability might have on human development. I start again with the effects upon within-country inequality before addressing between-country inequality.

3.1 Effects upon within-country inequality

3.1.1 Weak sustainability

Countries that are consistently weakly unsustainable are bound to experience increased within-country inequality in human development in the future. The reason is simple: weak unsustainability leads to deteriorating economic conditions in the future and under-mines the ability of the government to provide future public goods. Both are likely to hit the least well off much more than the well-to-do. The latter can shield themselves to a greater extent from these consequences with the help of private savings and investments, whereas the former are much more dependent on public income transfers and public investments into education and health.

3.1.2 Strong sustainability

The loss of critical forms of natural capital is likely to increase existing within-country inequality. The well-to-do find it easier to shield themselves from the negative consequences of the loss of critical forms of natural capital by substituting private for public environmental amenities. They also find it easier to adapt to a strongly unsustainable world and, if need comes, to migrate away from areas that are particularly hard hit. The less well off often cannot resort to these options. They are less able to buy private environmental amenities, less able to adapt and

are typically exposed to the full force of strong unsustainability, e.g. in the form of contaminated food and water resources, natural disasters, dangerous levels of pollution etc.

Unfortunately, even though strong sustainability hits the less well off more than the well-to-do and thus leads to more within-country inequality in human development, policies aimed at achieving strong sustainability need not decrease such inequality and may even increase it. True, by avoiding strong unsustainability such policies will erase one important driver of inequality, as explained above, even if some strong sustainability policies may actually benefit the well-to-do significantly as well – think of expensive ocean-front properties benefiting from policies aimed at mitigating climate change. However, such policies can also increase inequality (see Fullerton 2011 for a more detailed discussion). First, many strong sustainability policies will implicitly or explicitly raise the price of items such as fossil fuels or food, on which the less well-off spend a relatively larger share of their income. In other words, if not accompanied by other policy measures (on which more below), such policies are likely to be regressive. In fact, this can spark protest and social unrest to an extent that governments find themselves unable to enact such policies, as exemplified by recent events in Bolivia, where the government had to take back cuts in fossil fuel subsidies (International Herald Tribune 2011). Second, pollution abatement technologies tend to be capital-intensive such that strong sustainability policies aimed at reducing pollution will induce firms to demand relatively more capital and relatively more labor. The less well off derive a higher share of their income from labor than from capital. Third, if for political economy and political support reasons governments do not use taxes as an instrument for strong sustainability policies, but tradeable permits that are given away (partly) free of charge, then this creates rents and higher profits among regulated firms and since the well-to-do derive relatively more income from these sources, inequality can increase. Fourth, in order to

achieve strong sustainability there will have to be significant structural changes in the economy. If unsustainable sectors of the economy such as mining and logging intensively use relatively unskilled labor, while more sustainable sectors such as high-tech services, renewable energy and pollution abatement predominantly use relatively high skilled labor, then the less well off who are typically endowed with fewer skills may lose out.

What this amounts to is that policy-makers need to take the distributional implications of strong sustainability policies into account. If two policies are available that are similarly effective and similarly efficient, then they can choose the one which decreases rather than increases inequality. If that is not possible, they can use other policies to redress any regressive effect, for example, revenues from environmental taxes could be used to transfer income to the less well off. More generally, the challenge is to develop innovative policies that make headway toward strong sustainability and that are beneficial for the less well off as well (UN-DESA 2009).

3.2 Effects of unsustainability upon between-country inequality

3.2.1 Weak unsustainability

Countries with very high human development all have savings rates well above zero, the measure of weak unsustainability, while countries with high human development are unlikely to have negative genuine savings rates. It is the countries of low human development and countries in the middle, particularly if they are major natural resource extractors, that often have problems with weak sustainability (Neumayer 2010b). One consequence of weak unsustainability is that countries risk being worse off in the future than they currently are. Even if this does not happen – for example, because exogenous technical progress allows them to achieve higher levels of human development despite negative savings rates or because the currently existing genuine

savings measures fail to adequately capture the true savings rate of a country (Neumayer 2010a) – countries with negative genuine savings rates are likely to lose ground relative to countries with positive genuine savings rates. It follows from the fact that negative genuine savings rates are currently concentrated among the less well off countries that weak unsustainability is likely to increase between-country inequality.

Weak unsustainability is likely to have a non-linear impact on between-country inequality. Moderately negative genuine savings rates will leave the weakly unsustainable countries somewhat worse off in relative terms. Strongly negative genuine savings rates can have a much stronger than linear impact, however, if they catapult already fragile countries into a vicious circle of state failure, civil unrest, civil war and poverty traps, which lead in turn to even lower genuine savings rates (Collier 2007).

3.2.2 Strong unsustainability

Strong unsustainability is likely to affect the less well off countries more, thus increasing existing between-country inequality. There are two main reasons for this. First, some of the physical consequences of strong unsustainability will hit the less well off relatively more. Climate change is a good example. All climate models predict that the negative consequences of climatic change such as changes in precipitation patterns and extreme weather events will be more strongly felt by countries closer to the equator (IPCC 2007a; Stern 2007). It so happens that these are also the countries which are already less well off, such that climate change will, all other things equal, make them even worse off in relative terms. All other things are not equal, however, which leads to the second reason. Even if the impact were the same on all countries, the less well off countries have a lower capacity to deal with the impact of strong

unsustainability and to adapt to it than the better off countries. The death toll from natural disasters illustrates this point well: the less well off experience many more fatalities for hazards of any given intensity than the better off countries since the latter have managed to enact policies that protect their citizens to a great extent from the fatal impact of disasters (Plümper and Neumayer 2009; Keefer et al. 2011).

Given the evidence for non-linear impacts of strong unsustainability (IPCC 2007b), the effect of strong unsustainability on between-country inequality is likely to be non-linear as well. In other words, mild strong unsustainability is likely to have a minor effect on inequality while more pronounced strong unsustainability will have a strong impact on inequality.

4. CONCLUSION

In this paper, I have investigated the theoretical and empirical links between inequality in human development and sustainability, addressing both directions of causality. I conclude that vicious circles between more inequality leading to more unsustainability and vice versa are likely to exist. In turn, this will mean that policies aimed at reducing inequality and achieving sustainability have a good chance of resulting in virtuous circles or win-win situations.

I have given more detailed consideration to the linkages with strong sustainability as this is the arguably more relevant paradigm for the “sink” side of the economy – the pollution absorptive capacity of the environment and the provision of environmental amenities – that most people worry about when they care about “the future”. I have, however, pointed out that policies for achieving strong sustainability may well increase inequality in human development, at least in the short run. In many cases, such conflicts and trade-offs can be avoided by using another instrument (e.g., taxes instead of tradeable permits given away free of charge, which typically

create rents for the relatively well off, or auctioning off tradeable permits rather than giving them away free of charge), using multiple instruments (e.g., subsidies for public transport systems or for extending access to renewable energy sources to the relatively less well off), and using other policies to compensate for any regressive effect strong sustainability policies might have (e.g., using revenue from environmental taxes to transfer income to the relatively less well off). Imaginative and innovative policy combinations will thus be required to ensure virtuous circles in the short to intermediate run, while in the long run avoiding unsustainability should have major payoffs in terms of avoiding greater inequality in and possibly even promoting greater equality in human development.

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