



IERI Working paper
WP2019-002, April 2019

Human Capabilities and the Evolutionary prospects for Systems of Innovation in Sub-Saharan Africa

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Abstract

This paper examines the contending views on the concept of capabilities, counterpoising the neoclassical definition of human capital, and the neoliberal appropriation of this concept, to the broader human capabilities conceptualisation of the role of people in economic systems. This argument is developed within the framework of the systems of innovation approach to economic dynamics and its relevance to the development of national systems of innovation in sub-Saharan Africa is assessed. The historical and institutional roots of the human capabilities shortfall are discussed as well as the implications of this bottleneck to the evolutionary prospects for national systems of innovation, specifically in terms of their ability to shift on to a self-sustainable growth and development path.

JEL Codes: B25, O15, O38

Keywords: Systems of Innovation; Human Capital; Human Capabilities

Introduction

It is generally recognised that the shortage of skills is a major impediment to economic development across sub-Saharan Africa. This shortage is due both to deficiencies in education systems and to the skills and brain drain which has over time created a large diaspora of African expertise outside the continent. The continued failure to generate sufficient human capabilities and to retain those skills which are generated is both the symptom of the failure to transform economies away from dependence on natural resources and a cause of this enduring failure. From within the systems of innovation approach the capacity to generate, absorb and deploy human capabilities, especially in times of rapidly accelerating innovation, marks the evolutionary potential of national and regional systems of innovation. The definition and deployment for policy purposes of the widely used concept of human capital and the less prevalent one of human capabilities are, however, contentious and subject to different interpretations. It is therefore important to delve into the debates around the theoretical bases of these concepts to ground the generally accepted axiom that skills are essential for development in the analysis of the evolution of systems of innovation in Africa in a clearly specified understanding of the human capabilities concept.

The following section is devoted to this discussion which also addresses the specificity of human capabilities, in terms of the nature and extent of their grounding in local contexts. The section after that looks at the effects of colonialism and the transition through the various stages of the post-colonial era on human capabilities formation in Africa. This section applies a 'modes of innovation' approach to the analysis of African systems of innovation and their evolution since the wave of independence. The last section briefly charts out the policy implications of the discussion of the specific approach adopted in this paper towards the role of human capabilities in economic development in Africa.

Human capital and human capabilities

The origin of the currently commonly accepted definition of human capital lies in neoclassical economics which (see Mincer, 1958; Schultz, 1971; Becker, 1993) proposes that skills and knowledge embedded in human beings may be viewed as capital, in a manner equivalent to other forms of capital. From this perspective human capital can be analysed in terms of investment flows, costs, depreciation rates, and the returns on investment. While its theoretical basis lies in neoclassical theory, the concept has been appropriated by neoliberal economics, and this poses theoretical and normative problems. The general equilibrium framework of neoclassical economics is a fully determined system which depends critically on the premise of fully specified objective and constraint functions in order to derive unique welfare maximisation solutions. The fundamental underlying assumption of this theoretical framework is that of full information governing the constrained optimisation decisions of economic agents (called consumers, producers, etc.) whose conceptualisation is a highly abstracted construct far removed from any real life counterparts. Machlup (1967) warned against confusing the consumer or the firm in neoclassical theory with any real life equivalents. He was quite clear that these constructs were designed to trace changes in one market, under strict simplifying assumptions into effects in another market. This is where the "as if" assumption comes into operation, where a body of positive economics and its normative implications are built on the basis of assumptions which are never meant to be realistic. This is the inherent contradiction of a theoretical framework whose sheer elegance

and clarity of exposition render it a formidable pedagogic aid (see Scerri, 2008 and Scerri, 2012a) and simultaneously a poor empirical analytical instrument. The transition from the liberal economics of Adam Smith to modern neoliberal economics twinned with neoclassical theory constitutes the theoretical fallacy that Machlup warned about. Thus the fact that neoclassical theory has no place for competitive behaviour (see Stigler, 1957 and McNulty, 1968) has been ignored in the pursuit of bestowing on neoliberal economics the mantle of scientific validity claimed by the mathematical exposition of the neoclassical general equilibrium model.

The neoclassical formulation of human capital theory rests on the model of full information based decision making guided by a specific, highly restrictive, definition of rationality. The high level of abstraction which is fundamental to the neoclassical paradigm enables it to claim a universality of application which is independent of time and place. However, as soon as we relax the fundamental assumptions of a specific, asocial and universal, type of rationality, and that of full information, we are no longer working within the parameters of neoclassical economics. This implicitly invalidates the conflation of neoliberal economics with the neoclassical analytical framework which has evolved since the late seventies to buttress the translation of a *laissez faire* ideology into policy. Schumpeter, and even Hayek and von Mises for that matter, held little regard for the analytical limitations of the general equilibrium model, but Becker derives his free market prescriptions from the constrained optimisation and marginal cost-benefit models of neoclassical economics.¹

As applied by Becker (1993), human capital theory was co-opted to eliminate labour as a meaningful economic category with the proposition that human capital, accepted as equivalent to other forms of capital, implies that all agents are capitalists. This enabled Becker (1993: 16) to state that

...if capital exploits labour, does human capital exploit labour too – in other words, do some workers exploit other workers? ...are skilled workers and unskilled workers pitted against each other in the alleged class conflict between labour and capital?

in an attempt to eradicate labour as distinct analytical category in economics. The quotation from Becker uses the human capital concept to dismiss the validity of a Marxian theory of exploitation. Since, as it goes, only owners of capital can exploit labour and since some workers are also owners of human capital, we would end up with, for Becker, the apparently derisible conclusion that those workers who are skilled exploit those who are not. In fact, this quotation stops short of carrying the argument through to the possible extreme of its logical absurdity. If all workers are assumed to own human capital, of course to varying degrees, then, as the argument would go, exploitation would require that workers, to various degrees depending on the amount of human capital they own, exploit themselves. While Becker (1993: Ch 2) considered factors other than education, such as health, values and non-monetary returns in terms of the aesthetic quality of life, as determinants of human capital

¹ Chang (2001: 11) argues that “(n)eoliberalism emerged out of an ‘unholy alliance’ between neoclassical economics, which provided most of the analytical tools, and what may be called the Austrian-Libertarian tradition, which provided the underlying political and moral philosophy [Footnote in text: ‘I say an .unholy alliance., because the gap between these two intellectual traditions is not a minor one, as those who are familiar with, for example, Hayek’s scathing criticism of neoclassical economics would know (e.g., see essays in Hayek, 1949)’]”

formation, these were essential contextual factors and he still formulated the process of human capital formation within a broad marginal cost-benefit analysis framework.

Bowles and Gintis (1975) acknowledge that human capital theory had enriched neoclassical analysis by bringing in social institutions as important determinants of the supply of labour and enabling the analysis to allow for the differentiation of labour. Their critique of the neoclassical articulation of human capital theory rests on the implicit and explicit equivalence between human and other more conventional types of capital. In the process the issue of power and class formation had been excluded from economic analysis. In its equivalence with other forms of capital in neoclassical human capital theory, labour has been commodified as a tradable commodity along with other inputs into a production process which in a neoclassical world is itself completely removed from a social, political and historical context. As Bowles and Gintis (ibid: 74) put it labour ‘disappears as a fundamental explanatory variable and is absorbed into a concept of capital in no way enriched to handle labour’s special character’ and that ‘human capital theory is the most recent, and perhaps ultimate, step in the elimination of class as a central economic concept’. They further argue (ibid: 77) that

(t)he allocation of workers ... and the definition of ‘productive worker attributes simply cannot be derived, as the human capital theorists would have it, from a market-mediated matching of technically defined skills with technically defined production requirements. Issues of power, and ultimately of class, enter on a rather fundamental level.

The supply of human capital, through education, is similarly grounded in the prevalent structures of capitalist domination specific to a particular political economy. Marxian analysis rejects the individual, or household, rational constrained optimisation choice model of the supply of human capital. Bowles and Gintis (ibid: 78) dismiss individual choice as a case of ‘misplaced emphasis’ (see Scerri, 2008) where a true axiom is largely irrelevant as an explanation when set against other more weighty explanations of the formation of human capabilities. Bowles and Gintis also caution against the assumption inherent in neoclassical human capital theory that skills and competencies are homogeneous. Not only *what* is taught but *how* it is taught vary according to class, race, ethnicity and gender. Power configurations along these lines help explain the path dependence of systems and bring to the fore the role of an extra market agent, such as the state, normally as a reinforcing factor but also occasionally, in the case of historic ruptures, as a possible disruptive force in the established order of power.

An alternative approach to the analysis of the human factor in economic systems may be found in the concept of technological capabilities (Lall, 1992), defined as the ability to generate, absorb, deploy and adapt innovations, which are at the core of the systems of innovation approach. Within the narrow version of the NSI² the focus is on the relation between the science and technology (S&T) subsystem and the institutional mechanisms which translate the S&T output into commercially viable innovations. The human requirements for the functioning of this version of the NSI are scientists, engineers and technologists within formal R&D institutions, mostly embedded within the production sector, and the managerial capabilities to translate innovations into production. This translation itself requires certain levels of human abilities within the work force on the shop floor for its

² See Cassiolato and Lastres (2008) and Lundvall (2010) for an exposition of the narrow and broad versions of the NSI.

success. As we move to the broader version other factors, including institutional, social and cultural elements, enter as determinants of the shape and evolution of the NSI.

The broader version of this approach goes beyond the focus on the science and technology sector to incorporate institutions other than those directly related to science and technology. Rather, it focuses on the institutional formations which serve to translate innovation into sustainable economic growth and development. As the idea of the system of innovation broadens, so does the definition of innovation and consequently that of the relevant capabilities base of the general population. As we move from an economic to a political economy approach to the understanding of systems of innovation we increasingly locate economic factors in a political, cultural and historical context. In the process the definition of institutions is also expanded to include informal institutions in the form of established routines and practices which implicitly govern, through established values and norms, interpersonal relationships within the societal fabric of specific political economies. This is where the analysis of the nature and evolution of national systems of innovation becomes increasingly context specific.

Technological capabilities are a manifestation of the human factor in economies and systems of innovation which can still be incorporated within a broadened version of human capital theory. This factor may be rendered in a restrictive and reductionist sense as the set of skills in a country's population. Most of the theoretical development of the human capital concept within the neoclassical paradigm has focused on the relationship between education and human capital development. The determination of education, and subsequent human capital formation, is treated as a standard constrained optimisation exercise for the family unit and the individual agent, while allowing for externalities and public goods. The introduction of the notion of capital when discussing the human factor in economic dynamics brought in considerations of time, investment, returns on investment and depreciation.

It was Sen (1997; 1999) who advanced the concept of human capabilities as a more general set within which the neoclassical version of human capital lies. He does not however enter into the essentially ideological basis of the neoclassical/Marxian contestation on human capital. Sen (1997: 1959) defines human capabilities as 'the ability of human beings to lead lives they have reason to value and to enhance the substantive choices they have'. The placement of human capabilities at the core of the broadly defined national system of innovation requires that we adopt a version of the concept which anchors the formation of human capabilities as a process within specific social formations and orderings. With the introduction of specificity, we would then have to entertain the possibility of appropriate human capabilities. As with knowledge, certain categories of skills and competencies are codified and hence universal across contexts. The engineering competencies to build bridges are of this type, as is the technique required for arc welding. These are those competencies ranging from the higher SET tiers to basic skills, which are transferable regardless of context. However, there are other sets of capabilities, relating to broader problem solving and problem formulation, which are nurtured and formed in particular social contexts, and are largely tacit and 'sticky'. These capabilities form the learning and conceptualisation framework for the formation of more explicit codified competencies acquisition, usually through formal education. The formation of implicit tacit capabilities is usually value and ideology laden. The formation process is normally informal and tied into various socialisation and internalisation processes. It is also inevitably tied to power/knowledge configurations and

class structures. Normally this component of human capabilities formation serves to reinforce established social and political power configurations.

The evolution of capitalism and the development of human capabilities in post-colonial Africa

Galor (2012) points out that the evolution of capitalism from early industrialisation to advanced capitalism or late industrialisation has caused a shift in emphasis from physical capital to human capital accumulation as the basis of growth and development. I have similarly argued (Scerri, 2013) that in the global progression of the dominant mode of innovation³ human capabilities have increasingly become the determining factor in the wealth and competitiveness of systems of innovation. I further argue that in general post-colonial African systems of innovation are marked by a systemic disjuncture between their prevalent mode of innovation and the dominant global late and post-industrial ones. The implication for the relationship between inequality and growth are drawn out by Galor as he argues that while income inequality, which favoured savings (assuming that the rich had a higher propensity to save), promoted growth during early industrialisation, with its reliance on physical capital formation, it impedes development in late industrialisation due to its deleterious effects on the formation of human capabilities which have supplanted physical capital accumulation as the driver of the growth process. Galor further argues that in underdeveloped economies, with a poorly developed urban industrialised sector and a landowner dominated rural sector, there is a systemic disincentive for human capabilities formation. Generally, a high asymmetry in the distribution of the ownership and control of resources tends to retard human capabilities formation in order to retain the existing patterns of privilege.

In 1962 Fanon (1983: 132) referred to the emerging newly independent African economies as “national systems of oppression”, based on his contention that the new post-empire constructs were locked into political economies governed by a newly formed African bourgeoisie whose *raison d'être* is a reconfigured form of extraversion (Bayart, 2000)⁴. Olutayo and Omobowale (2007) point out that the initial stage of state capitalism after independence was a carryover of the colonial model of economic administration and that

...the capitalist ventures in which the state invested were mainly revenue generating in nature rather than for the fundamental transformation of the social structure. (Olutayo and Omobowale, 2007: 103)

³ I base the concept of modes of innovation on a theory of value which is predicated on historical streams of innovation. A specific mode of innovation is characterised by patterns of ownership and control of the human and non-human means of innovation (Scerri, 2012b and 2013)

⁴ Defined as ‘... the creation and the capture of a rent generated by dependency and which functions as a historical matrix of inequality, political centralisation and social struggle ...’. (Bayart, 2000: 222). Bayart (2000: 231) further points out that “... Africa has a tendency to export its factors of production in raw form, whether in terms of the working capacity which it exports in the form of migration, or the agricultural or mineral resources which it exports in either formal or informal systems, or the capital which it expatriates in the form of flight capital and, more rarely perhaps, as debt repayment. The people who manage this unequal relationship with the international economic system are able to derive from it the resources necessary for their domestic overlordship”.

In those countries where allegiance was shifted to the USSR, a similar lack of transformation was evident since “...technologies were imported...rather than the indigenous creation of...own technologies” (Olutayo and Omobowale, 2007: 104). The “national middle class”, to use Fanon’s term, which emerged within this newly created space in the post-colonial political economy inherently sets up blocks to the development of a sophisticated local capitalist mode of production and innovation⁵. Partially, this would be due to the concern about a dispersion or relocation of positions of privilege away from those which developed from the position of “concession holders”. This set of vested interests also determines the context for human capabilities formation and retention. At a basic level, human capabilities development would be predicated on an industrialisation process which would shift control over the means of innovation (and production) away from external agents towards the indigenous agents within the emerging NSIs. The “national middle class” which emerged with independence would not have had the incentive to shift its accumulation regime, nor may it have had the capability to manage such a shift while maintaining its monopoly over the appropriation of the new streams of accumulation. There was therefore generally a strong disincentive for the new capitalist class in independent Africa to embark on the road to more advanced modes of innovation (and production). This meant that there was little incentive to alter the levels and patterns of human capabilities development fundamentally away from those which had been developed under colonialism. As long as African economies are still based on forms of extraversion, the progression to a more advanced mode of capitalism and innovation, which is dependent on indigenous availability of broad based capabilities will be handicapped. At the same time the very lack of capabilities itself poses an increasingly formidable block to the transition (Scerri, 2012b) in an increasingly dynamic and volatile global economic environment.

We should, of course, guard against too reductionist an account of an inevitably complex formation of economic exclusion as an enduring informal institution in the post-colonial period. However, while gender, ethnic and geographic inequalities, and exclusion, are immanent in specific forms in most systems of innovation, the new modes of class formation which emerged with the wave of independence across the continent has largely dominated and affected all other forms of exclusion. It is here at this historic cusp that we should examine the new path in the co-evolution of African NSIs and exclusion.

Generally, Suryanarayana (2008) defines economic exclusion as (a) the failure to participate effectively in the production process, (b) the inability to benefit from the production process in terms of income generated, and (c) the inability to experience welfare improvements as measured by consumption. The main impediments to inclusive development are usually interlinked and mutually determined. They are generally manifest in the absence of an effective political voice for the excluded and arise from specific path dependent low trajectories of human capabilities development. In the case of African NSIs the enduring reliance on extra-national sources of public revenue helps to reinforce the low levels of political leverage of the excluded. This enduring modern form of extraversion also implicitly favours a human development policy stance which tends to be predicated on the concept of the benevolent state rather than one which recognises the importance of the participation of the entire population in the development process.

⁵ “To them (the national middle class), nationalisation quite simply means the transfer into native hands of those unfair advantages which are the legacy of the colonial period.” (Fanon, 1985: 122, parentheses added)

The post eighties form of globalisation, marked by the hegemony of neoliberal economics and a historically unprecedented movement of people and resources, has further exacerbated the plight of the excluded. The link between the ownership and control of the means of production and innovation has become increasingly attenuated with control increasingly removed from the physical location of labour engaged in production. As Bauman (1998: 9) put it,

(t)he mobility acquired by ‘people who invest’...means the new, indeed unprecedented in its radical unconditionality, disconnection of power from obligations: duties towards employees, but also towards the younger and the weaker, towards yet unborn generations and towards the self-reproduction of the living conditions for all...

has virtually eliminated the forms of accountability which had previously limited to some extent the social and economic effects of the concentration of control of the means of innovation prior to the type of globalisation which emerged since the nineties. This latest form of globalisation has increasingly anchored the excluded to the local while unfettering the privileged ‘people who invest’ as global citizens.

The heavy skills drain out of Africa is a manifestation of the continent's inability to absorb the skills it generates. The proportion of high skilled African immigrants to OECD countries in 2000 represented 31% of the total emigration stock (rising from 22% in 1990) compared 6% of the continent's population (Marfouk, 2007: 14). The main reasons identified by Marfouk's (2007) comprehensive study of migration out of Africa are conflicts based on religious and ethnic differences, unemployment (relative to the destinations for migrants), and income inequalities in the source countries. In the case of the last factor Marfouk isolates two different effects of inequality on the type of migration. Where income inequalities are low, emigration tends to be among the higher skilled and driven by career choice. Where inequalities are high there is an increased incidence of lower skilled migration driven by necessity. Other factors which influence the direction of migration are past colonial links and language similarities, the type of welfare systems in the destination countries, and immigration policies in the destination countries. Ratha and Shaw (2007) point out that in the case of sub-Saharan Africa, the majority (approximately 69%) of African migration is within the region. The main determinants which they identify for the size and directions of these flows are conflict and disaster, income differentials, petty trade, geographical proximity, and networks in the form of ethnicity, community and family ties.

Most of the literature on the drain of skills and expertise out of Africa has focussed on the higher end of the skills spectrum (scientists, engineers, doctors, etc.). From within the systems of innovation approach this focus implicitly assumes the narrow definition of the NSI, restricted to the science and technology sector, as the analytical base. If the broader definition is adopted⁶ a fuller consideration of the broad skills base becomes necessary for a clear understanding of the effects of the human capabilities drain on NSIs in Africa. While scientists, engineers and technologists are crucial to the evolution of research and development (R&D) capacity, it is the human capabilities base of the labour force in general (technological capabilities) which determine the prospects for industrialisation and hence for

⁶ In the postscript to Lundvall (2010: 317-318), Lundvall argues that without the broad version of the NSI, it would be impossible to draw out any meaningful relationship between innovation and economic growth. His argument gains greater strength in the case of developing economies where the radical transformation of the NSI is often the requisite for development.

the evolution of the NSI. From this perspective the broad based human capabilities constraint is a far stronger impediment to the evolution of African systems of innovation than that of higher order skills. The instability and the precarious conditions of the institutional environment in which the general population lives in most African countries impedes the structural transformation of economies towards more value added sectors and thus constrains absorptive capacity for higher order capabilities, with the consequent brain drain from the continent. One may even venture to propose that in the absence of the requisite set of conditions which ensure the appropriate context for an assured generation and reproduction of human capabilities across all levels in a particular NSI the brain drain is inevitable due to the general absence of the employment opportunities for the highly skilled sector of the labour force. The extent of intra-Africa migration is a clear indicator of the precarious material conditions of life for the majority of the continent's population. At the most extreme end, this instability is due to conflict and drought which threaten survival. The more prevalent causes are the uncertainty of sustainable employment and the consequent absence of guarantees about the ability to ensure the long term economic integrity of the family unit.

Table 1: Progress chart for Africa towards the Millennium Development Goals (2015)

Goals and Targets	Africa	
	Northern	Sub-Saharan
GOAL 1 Eradicate extreme poverty and hunger		
Reduce extreme poverty by half	low poverty	very high poverty
Productive and decent employment	large deficit	very large deficit
Reduce hunger by half	low hunger	high hunger
GOAL 2 Achieve universal primary education		
Universal primary schooling	high enrolment	moderate enrolment
GOAL 3 Promote gender equality and empower women		
Equal girls' enrolment in primary school	close to parity	close to parity
Women's share of paid employment	low share	medium share
Women's equal representation in national parliaments	moderate representation	moderate representation
GOAL 4 Reduce child mortality		
Reduce mortality of under- five- year-olds by two thirds	low mortality	high mortality
GOAL 5 Improve maternal health		
Reduce maternal mortality by three quarters	low mortality	high mortality

Access to reproductive health	moderate access	low access
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GOAL 6 | Combat HIV/AIDS, malaria and other diseases

Halt and begin to reverse the spread of HIV/AIDS	low incidence	high incidence
Halt and reverse the spread of tuberculosis	low mortality	high mortality

GOAL 7 | Ensure environmental sustainability

Halve proportion of population without improved drinking water	high coverage	low coverage
Halve proportion of population without sanitation	moderate coverage	very low coverage
Improve the lives of slum-dwellers	low proportion of slum-dwellers	very high proportion of slum-dwellers

GOAL 8 | Develop a global partnership for development

Internet users	moderate usage	low usage
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The progress chart operates on two levels. The text in each box indicates the present level of development. The colours show progress made towards the target according to the legend below:

Target met or excellent progress
Good progress
Fair progress
Poor progress or deterioration

Source: UN MDG Report, at http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20PC%20final.pdf

The overriding goal of improving the quality of life of the general population, concisely captured in the Millennium Development Goals (MDGs), is usually implicitly articulated as the desired outcome of sound economic and social policy. Table 1 clearly indicates the general failure in sub-Saharan Africa to move significantly towards the set MDG goals, the high economic growth rates over the first decade of the new millennium may have contributed to areas of progress on these goals. The different performance between Northern and sub-Saharan Africa should also caution against an easy aggregation across the continent, as should the markedly differences in the performance of individual countries, which is not represented here. These MDGs should not however be interpreted simply as the markers of the agreed objectives of development policy. From a capabilities perspective they are simultaneously the constituents of human capabilities formation and as such they are the prerequisites for development. This is the bind that has locked in the historical and contemporary path dependence of the evolution of most African NSIs. This distinction implicitly mirrors the differences in the policy implications of human capital theory and the human capabilities approach. The focus of the former is on human development as a private investment in expectation of personal returns with the onus on private agency. Issues of institutionalised exclusion, on the basis of class, gender, race and ethnicity, geographic location, and innumerable other markers, are implicitly taken on as contextual factors in the process of human capital formation.

Policy implications

At the very start one should ask why inequality and exclusion matter, since the answer often contains policy implications. Almost all countries hold equal rights for all citizens as part of their general value system, often written into a bill of rights. All too often, however, high levels of inequality and exclusion are present. One reason is that historically determined forms of discrimination, especially along class, gender and ethnic lines, persist, regardless of values espoused in constitutions. Often, however, the reason can also be found in the fact that inclusion and the reduction of inequality are usually viewed solely from the perspective of values. This is where conventional approaches to economic development, based in mainstream economics, usually advocate a “trickle down” effect where growth would lead to re-distribution. This assumption may be complemented by some re-distribution and transfers policies managed by the state, usually with the proviso that such policy measures should not be inimical to the growth of the private business sector.

The systems of innovation approach would have an entirely different focus due to the manner in which it understands economies. Within this approach broad based technological capabilities, defined as the ability to absorb, deploy and adapt new knowledge, are at the core of the national system of innovation (NSI). From this perspective the enduring economic exclusion of a significant part of the population is seen as a major impediment to the evolution of the NSI towards sustainable viability.⁷ The implication for policy from this approach is that inclusion and the reduction of inequality should be seen as both the end and the means of development policy. This proposition arises from the fact that human capabilities development forms one of the main instruments in the development of NSIs while its effects on general income levels and the quality of life is a prime objective of development. It also rests on the assumption that the family is the location of human capabilities development and appropriate human capabilities development policy should safeguard the structural integrity of the average family. Human capabilities are both a public and a private good, with returns to their owner in the form of higher lifetime incomes⁸ and public returns in terms of the capacity effects within the context of the NSI. The investment time horizon in the case of human capabilities should normally run over a period of eighteen to twenty odd years, from the birth⁹ of a child to the manifestation of the first explicit returns as income with the entry of that human being into the labour market. Over such a long period human capabilities formation is a risky investment which can be disrupted by an innumerable number of factors affecting the conditions of life of individuals and family units. Furthermore, the returns on human capabilities investment are usually characterised by low degrees of appropriability by external agents.

These two factors, risk and the inability to appropriate, form the basis of the argument for a strong role of the state as an extra-market co-investor in this particular investment "project". Given the starting assumption that the family unit, however that is defined, is the main location of human capabilities formation, the ideal public-private partnership in this case is therefore a symbiotic relationship between the family unit and the state. Failure on this front,

⁷ Scerri (2009: 37-38) defines the viability of national systems of innovation in terms of their ability to reproduce, to grow and to evolve.

⁸ The relationship between human capital investment and life time incomes is never as clear as neoclassical economists propose.

⁹ In fact it should be argued that the investment streams commences prior to birth with the material conditions of life, especially in terms of health, of the mother.

places an impossibly high demand on the availability of private investment funds which generally, but especially in conditions of underdevelopment and poverty, would exacerbate and entrench inequality and exclusion. The consideration of human capabilities, rather than human capital, as the relevant object of analysis also opens up the range of the determinants of human capabilities formation which extends considerably beyond education. A whole gamut of the constituents of the reproducible material conditions of life have to be included. The implication is then that, especially in a development setting, it is important that the conventional separation between economic policy and social policy is eroded and that basic needs provision is allocated as high a priority as any conventional economic policy.

The consequences of inadequate and ineffective policy to address exclusion are quite significant in the evolutionary process of the NSI. The main effect is the supply side (human capabilities) constraint on the development of a technological capabilities base required for development. Then there is the demand side constraint (internal markets) on the local innovation drive. This constraint would prevent the normal trajectory of innovations first being developed and tested in a local market which is somehow and somewhat protected until the search and learning processes enable exposure to international markets. Finally, the failure of policy to address effectively the systemic exclusion of large segments of the population holds implications for the long term stability and integrity of the NSI. The broad version of the NSI account is firmly anchored in political economy where the role and placement of civil society is a crucial factor in the shape and nature of specific NSIs. An enduring failure to improve the material conditions of life and the life prospects of the majority of the population, especially in the presence of high degrees of inequality, obviously sets the conditions for political instability and a consequent shortening of planning horizons. Such NSIs would continue to exhibit high degrees of path dependence and a continuation of "national systems of oppression", with the cumulative entrenchment of privilege and exclusion. Human capabilities development would mostly be in the form of high end skills development at the expense of broad based human capabilities; even so, the low absorptive capacity of a poorly developed NSI would result in skills drains. All these factors would result in restrictions on industrialisation options, especially in the context of increasingly competitive global markets, and a depressed capacity to achieve non-resource based competitive advantage.

Concluding remarks

All too commonly, the conceptualisation of the human factor in the development process has been formulated in a fragmented manner, with education normally singled out as the focus of economic policy. Within mainstream economics, the human capital concept tends to reduce the focus on formal education. Other determinants of human capital formation, in terms of nutrition, health, connectivity, community support and security, are usually studied exclusively as the constituents of the quality of life of populations. These other factors which are at least as crucial to the formation of human capabilities are normally relegated to the area of "social policy" and viewed solely as the goals of successful development policy. The human capabilities formulation enables a more integrated approach where the various policy areas which affect capabilities formation and development can possibly be developed. It is also cognizant of the contextualisation of human capabilities formation and this understanding may help break the combination of an insecure provision of human capabilities

and low absorptive capacities which have historically proved to be a formidable bind on the evolution of NSIs.

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