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Reformulating the Critique of Human Capital Theory

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ABSTRACT

Despite criticism, human capital theory (HCT) has remained central for six decades to the teaching and practice of economics. This paper reformulates the critique of HCT, focusing on two aspects that are typically relegated to the margin. The first of these is the pervasive presence of the external effects of learning, which is paid lip service in formal expositions of HCT but marginalized in the bulk of empirical work and policy advice. Similarly, marginalized are the social determinants of education demand. We show that the embedding of HCT in methodological individualism makes impossible the incorporation of key, non-peripheral factors that affect the demand for, and effects of education. The resultant tensions from the use of an individualistic methodology to explain inherently social phenomena have been accommodated within HCT by ignoring them. The outcome is problematic in important fields of socioeconomic inquiry, several examples of which are noted in this paper. We conclude by advocating a new research agenda and revised program for the training of economists concerned with learning that includes behavioral economics, applications to education of the capability approach, and an expansion of empirical research on the external effects of education in historical and contemporaneous contexts.

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1 | Introduction: Human Capital Theory and its Critics

Despite recurrent criticism, over the last half century, human capital theory (HCT) has sustained a hold on the training and practice of economists. “Human capital” is widely deployed as a synonym for skill, but HCT is much more: it is a paradigm of how education and training relate to the economy. The theory is in contrast to traditional institutional approaches, to credentialism and other sociological theories, and to emerging alternatives such as the capability approach to education and the deployment of behavioral economics in the analysis of learning (Rubenson and Browne 1994; Buzzelli 2015; Lavecchia, Liu, and Oreopoulos 2016). The persistence of HCT, despite recurrent criticism, is significant not only because, as we shall argue, HCT constrains scientific understanding of the forces shaping education, skills, and socioeconomic inequalities, but also because HCT frames

and limits the discourse surrounding skills and education policy in many parts of the globe. The aim of this paper is to revisit and reestablish the critique of HCT in its application to education and training. We present a systematic, reformulated critique, thereby facilitating a future reframing of the education–economy nexus that can reintroduce neglected insights from economics and other fields of study.

HCT emerged as a central field of study in mainstream economics in the 1960s from what had been perceived as an empirically oriented literature concerned with education and training. The central figure was Gary Becker, who linked the analysis of the demand for education and its benefits to the theory of choice found in other branches of microeconomics (Becker 1962). The analysis is rooted in a methodological individualism that assumes that learning can be studied through the construct of a representative individual who proceeds through learning to

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accumulate human capital. This approach was, in the words of one of Becker's prominent supporters, "in stark contrast to that of the institutionalists who often favored ad hoc generalizations to 'let the facts speak for themselves'" (Heckman 2017, 1842).

This microeconomic program, while deemed important in itself, was secondary to the primary motivation for the formulation of HCT, which was macroeconomic: It had taken on the ambitious task of accounting for, and normatively framing, the role of learning in economic development (Becker 1993, 385). The issue had been raised by others before Becker, including one of the cofounders of the theory, Theodore Schultz, with the latter affirming a role for the expansion of public education in this process, as did, at one stage, Milton Friedman (Fleming 2017; Holden and Biddle 2017). But in the context of Cold War rivalry with the Soviet Union over economic growth, HCT in the strictly individualistic form offered by Becker suggested a framework in which individuals had an incentive to invest in education without the impetus for this expansion to emerge from the state sector (Lott 1987).¹ The research program emerged alongside burgeoning literature using an aggregate production function to analyze the contribution of the various factors of production to economic output (Solow 1957). The leading conundrum emerging from this research concerned "the residual"—the large share of the value that was empirically unaccounted for by inputs of labor and capital, which was then variously attributed to technological change and to improvements in the quality of the labor input by way of education (Denison 1962).

Criticism of HCT is long-standing. Nearly half a century ago, Blaug (1976a) deployed a Lakatosian framework to assess the first decade of the HCT research program.² Notwithstanding a flood of empirical research on rates of return, he lamented the shortage of critical tests of its key predictions and concluded that HCT was suffering from "prediction failure". Blaug opined that the HCT research program would fade away since it was already degenerating into "ad hocery", but his conjecture proved to be wrong. The very phrase "human capital" has become a common currency, and not just among economists. More importantly, the theoretical aspect of HCT has remained dominant in teaching about education and labor markets in mainstream economics, in the training of professional economists, and in the thinking of policymakers at national and international levels. White (2016) triumphs that "the success of the human capital research program is reflected in the fact that, as the decades have passed, its opponents have moved to the margins of economic discourse."

Since the beginning of the HCT era, economics textbooks covering education, labor, or development have presented core procedures for estimating rates of return, rehearsed the econometric issues involved, and run through perturbations, such as signaling theory and discrimination theory (Fleisher and Knieser 1970; Borjas 2020; Todaro and Smith 2020). None seem to echo, and few confront, the misgivings voiced by Blaug half a century ago; none recognize alternative frameworks for investigating the demand for education, including behavioral and capability approaches. Policymakers, meanwhile, are steeped in HCT and, while recognizing that education has social components, tend in practice to base most policy recommendations on estimates of private—not social—returns.

HCT has the following distinctive aspects. First, it conceives education as augmenting human capital, the latter a key argument of the production function, and it treats educational choice by analogy with machine investment, using conventional discounting methods. Second, HCT is an application of methodological individualism to the study of both educational choice and educational outcomes. Lastly, HCT carries the expectation of normally well-functioning markets for both education services and skilled labor, thereby downplaying consideration of such real-world phenomena as overeducation. This third characteristic is not an inevitable consequence of adopting the first two; it would be especially hard, however, to defend the plausibility of the first two assumptions about individual behavior in a world where the markets associated with education and skilled labor were unstable or nonexistent. In practice, those who adopt the first two features also adopt the third.

Both early in the life of HCT and to this day, some critics have argued that education does not raise—or is only loosely related to—productivity (Sobel 1978; Tan 2014). One version of this argument is that educational qualifications afford only social status in a credentialist society (Collins 1979), so education should be seen as a positional good; another version has suggested that education signals, but does not itself generate, higher productivity (Spence 1973). At the macroeconomic level, critics maintain that enhanced educational expenditure does not raise economic growth and development or, more commonly, that education is not closely related to growth, implying that education policy should not be the ubiquitous refuge of economic growth strategies (Brown, Lauder, and Cheung 2020). Other critics accept that education affects productivity, but maintain that it does so by raising noncognitive rather than cognitive skills—a distinction that acquires significance where the noncognitive skills (valued social attitudes) are inherently social. A pejorative version of this critique suggests that formal education inculcates the relevant attitudes and behaviors desired by employers (Bowles and Gintis 1976, and as modified Bowles and Gintis 2002). This radical economics school challenged HCT for its failure to problematize the content and socioeconomic context of schooling (Bailey 2016). This critical perspective contrasts with more favorable approaches to the importance of the economic impact of noncognitive elements, such as Cunha and Heckman (2007), Heckman, Rodrigo, and Savelyev (2013), and Cornelissen and Dustmann (2019), which stem from studies of childhood education. Such studies in the "economics of human development" may be construed, not as rejections of HCT, but as extensions that incorporate findings from epigenetic science to child development, and then into a model concerned with the technology of human capital formation. Yet education philosopher Gilead (2009) argues that there is a tension between the need for schooling to promote social cooperation and the normative prescription implicit in HCT to fashion cognitive abilities through schooling so as to promote lifetime wealth maximization. Be that as it may, many critics see the outcome of education embodied in HCT as too narrowly material (Buzzelli 2015).

Critics have also questioned whether education raises wages as HCT predicts, noting that pay has grown more unequal in ways that are not adequately explained by the theory, most especially at the highest levels of remuneration, and that wages have industrial determinants in imperfect, often segmented labor markets (Piore

and Sabel 1984; Brown, Lauder, and Cheung 2020); Marginson (2019) draws on the “critical realism” school to question the validity of much of the empirical evidence for the effect of human capital on pay.

Other critics argue that decisions on education are socially determined, rather than being the outcome of a rational cost-benefit calculation (Tan 2014). Decades ago, John Kenneth Galbraith and even Theodore Schultz (an HCT founder) doubted that the aggregate dynamics of education could be theorized as the consequence of individual decisions (Chirat and Le Chapelain 2020). A critique from radical economists and others has been that HCT eliminated consideration of the effects of social class and conflict (Bailly 2016; Tan 2014); Leary 2019). Sociologists have argued that increased provision for education in the latter half of the 20th century was in response to rising aspirations and status competition, independent of putative increases in the demand for skills (Ralph and Rubinson 1980; Marginson 2019). Education historians have maintained that the expansion of education systems in East Asia is better accounted for by the theory of the developmental state than by HCT (Green 2013, 354). Some analysts choose a selection of the above critiques (Vally and Motala 2014; Ali 2017).

The resilience of HCT within economics and at the heart of policy-making has been attributed by its critics to the hegemony of neoliberal economic principles which favor market-simulating strategies for advancing education (Vally and Motala 2014). This interpretation has merit, in that the three-pronged hallmarks of HCT tend to support incentive-based solutions to classic education policy problems. Human capital theorists reject such claims of a purported free-market bias, arguing that often such solutions can lend themselves to progressive education policies and that indeed Becker supported public interventions to incentivize skill acquisition for the poorly educated. Nor were these theorists distracted by the model’s absence of any conceptualization of social class or of associated notions of exploitation that stem from the Marxian concept of class (White 2016), and were not discouraged by the failures of early research efforts to find decisive links between education and economic growth; the resilience of HCT stemmed in part from its deployment into new areas, especially within labor economics, such as discrimination and age-wage profiles (Sobel 1978). There are, however, other reasons why criticisms may have failed to alter the reception of HCT: the lack of a coherent overall critique and a failure to articulate an alternative underlying theory. Too many critiques are piecemeal, and often make naïve complaints about the statistical modeling of education–economy relationships, when in fact data collection, modeling, and testing methods have progressed almost beyond recognition in the time since HCT emerged as orthodoxy. Critics rarely acknowledge that HCT successfully predicts some policy-relevant outcomes that are substantiated using experimental methods. For example, the demand for education can often be seen to respond to incentives for higher remuneration (Jensen 2010), a fact that in no way precludes the theoretical centrality of social aspirations. Rather than respond to empirical studies that imply that education does affect economic growth on average, critics place undue weight on individual cases of developmental failures. Other critics adopt an all-or-nothing stance, in which one piece of conflicting evidence is naively claimed to invalidate the whole edifice of HCT. None of these critiques, however, give a

central place to the inner tensions of HCT that spring from its first-order neglect of both social determination and externalities in its analysis of education—the problems which we identify below.

The long-term survival of HCT does not necessarily imply that it can be described as a progressive research program—one which moves forward by continually generating and testing new hypotheses. It is true that the economics of education literature has expanded considerably in recent decades: the number of papers concerned with education in eight leading mainstream economics journals rose from 38 in the 1980s to 134 in the 2000s (Machin 2014), rising further to 172 in the 2010s.³ Yet this increase reflects an environment of improving data, wider recognition of the general importance of education, and a rising demand for evidence-based policy on schools, rather than a fecund HCT paradigm with mushrooming testable predictions. Most of these scientific papers do not require an individualistic perspective on choice, or assumptions about competitive processes. In reality, those attempting to understand the macro-social dynamics of education rarely turn to HCT in an explicit manner (e.g., Goldin and Katz 2008). The bulk of the economics of education literature is concerned with improving the understanding of educational production, and its considerable contributions are largely empirical. HCT’s theoretical (as opposed to methodological) contribution to the *education* literature, including the literature on aspirations and choice, remains small. The study of education itself appears to have been barely touched.

Although many of the concerns of the critics of HCT continue to merit serious consideration, few have come to be voiced in economics journals, with the result that no proper debate has taken place: The discourse is segmented and disjointed, and thus from a scientific perspective diminished. Responses to criticisms from supporters of HCT, such as that by White (2016), are rare. In view of the ongoing dominance of HCT in economic theory and in instruction and education policy-making, a coherent and systematic critique is necessary in order to engage scholars both inside and outside the discipline.

In the next section, we set out the problems that arise from applying methodological individualism to education. Our critique is focused on the marginalization of the social determination of education and its external effects. To illustrate the problem, Section 3 outlines five implications for economic analysis. Section 4 describes the problem arising from HCT’s assumptions about well-functioning education and skilled labor markets. Section 5 concludes with a discussion of emergent potential alternatives and ways forward for economics to better frame the relationship between education, economy, and society.

2 | The Problem of Methodological Individualism as Applied to Education

Learning in the broadest sense, whether through formal or informal education, is exceptionally inappropriate for a reductionist approach that seeks to devolve the unit of analysis to that of the individual actor and excludes or downplays the associated panoply of social interactions. A key component of our critique of HCT is that, through its methodological individualism, HCT

perceives the social context of learning, as well as many external (nonprivate) outcomes associated with learning, as being of a second order of magnitude—often to be ignored altogether.

Consider first the social context of learning and the demand for education. In HCT, learning results from an individual's decision to incur current costs to gain future benefits, the outcome of a maximization of an exogenous, stable utility function in the face of a given technology of learning. HCT thus offers only limited space for social influences on learning.

Some aspects of the provenance of learning are now entering the economics literature under the rubric of peer group effects, the study of which has become a subfield of education economics (e.g., Sacerdote 2011; Gibbons and Telhaj 2016; Agostinelli et al. 2020; Barrios-Fernández 2022). However, peer effects remain, on the whole, a peripheral issue in the human capital literature: with its focus on decision-making at the level of the individual, as well as its emphasis on the learning experience of young adults as opposed to that of children, HCT encourages an avoidance of the social context in which individual decisions concerning the demand for, and participation in, education are made. The HCT approach misses the significance of the formation of social norms and of a whole range of peer group effects that are relevant in the learning context. Potential influencers include the family, the neighborhood cohort, fellow students, teachers, and guidance counselors. Peers affect the acquisition of knowledge, the formation of aspirations, behavioral norms, and especially in the case of children, the evolution of personality. At all stages of learning, cohorts play a key role in the setting of standards for levels of achievement and, especially in a school-related context, of individual conduct and attitudes (such as work norms and study habits). Peers are a source of learning for others through exemplification and emulation. Unsurprisingly, awareness of peer relations motivates parents when they search for a “good” school.

Social class is a key variable for the understanding of peer effects on children's preferences, aspirations, and behavior (Ali et al. 2021). Class divisions also condition the packets of information and guidance available to different cohorts, oriented in favor of, or against, specific paths to employment or occupations. Yet delineations in demand for education based on class division are largely invisible in the human capital literature, with the latter's focus on autonomous decision-making at the personal or household level, with a similarly restricted vision with regard to issues of race and gender (Groeger 2021). The individualistic focus of the theory is reinforced by the presumption that “abler persons can expect a higher rate of return from investing in themselves, and therefore will do so to a greater extent than others” (Becker 1962), with the measure of ability proffered emerging from heritable IQ (Becker 1976). The latter approach appears outdated in the context of 21st-century research, with a president of the American Psychological Association suggesting that “Intelligence cannot be fully or even meaningfully understood outside its cultural context” (Sternberg 2004; see also Nisbett et al. 2012).⁴

The other way in which HCT marginalizes social considerations is in its treatment of the external effects of education on the economy and society—sometimes referred to as spillover effects. If external effects were, hypothetically, to be given comparable

billing in HCT with the private benefits of education, it would pose a threat to HCT's normative infrastructure, including a great deal of policy-making that is built on the exclusivity of private returns.⁵ Yet history, theory, and some formal evidence tell us that spillover effects from education are pervasive, substantial, and can be manifested both in the short- and, most especially, in the long-term. Even if the focus is on narrowly defined economic criteria, major channels for external economic effects are, *inter alia*, communication, emulation, the generality of knowledge, inter-generational transmission, and public goods.

Improvements in individuals' communication skills, such as language literacy yield unremunerated gains to society. Such gains are analogous to the positive externalities inherent in purchasing a telephone in 1930: the value of everybody else's telephone is increased. The more literate and numerate is the consuming population, the more articulate they will be in communicating their wants to producers. An enhancement of communication skills thus lowers the costs of search. Improvements in knowledge by consumers in particular areas can facilitate the monitoring of product quality.⁶ There can also be spillover effects within workplaces: in imperfect labor markets the gains from deploying more highly literate and numerate workers will be incompletely attributable to these workers.

Learning through emulation of experts and coworkers is a second spillover channel. As economies develop, the number of individuals whose skills are worthy of imitation increases; a similar tendency will take place in the expansion of the range of institutions, both governmental and bureaucratic, as well as firms and cooperatively-run enterprises, whose superior organizational capability can be observed and replicated. As the ease of observation of the actions of other individuals and institutions grows, the role of emulation is likely to expand, in the absence of barriers created in the form of intellectual property rights.

A third spillover channel derives from the generality of much knowledge and technological know-how: the more fundamental are any accretions to knowledge by an individual or firm, the more difficult it is for that individual or firm to capture the full value of that knowledge. At one extreme, fundamental scientific knowledge is publicly available and can be replicated by others; craft-based knowledge, in contrast, has a greater possibility of being preserved in closed hands (e.g., the making of a Stradivarius violin). As, over time, the ratio of science to craft-based knowledge rises, the cohort of individuals capable of monitoring these broadly available increments to knowledge increases, so that spillover effects become more likely, notwithstanding the use of legally binding IPOs. Appropriate education thus becomes more important, not just for the emergence of new ideas, but for the assimilation and appropriation of already existing knowledge on a worldwide basis, a role of special importance for countries where technologies lie away from the technological frontier, including many developing countries (Mason, Rincon-Aznar, and Venturini 2020). Spillover benefits of education through the growth of new, dispersible knowledge may occur both within sectors (such as within industrial clusters) and especially where skills are complementary, across sectors. Technological spillovers of this kind vividly illustrate how societal gains exceed those of individuals. However, the difficulties and the time involved in the integration of skills from diverse sectors implies that there may be long lags

in the beneficial external effects of cognitive improvement on overall societal economic development; spillovers of this kind are standard in endogenous growth theory (Lucas 1988; Romer 1990).

The salience of long-lagged effects is also shown in the fourth major spillover channel: inter-generational effects. The empirical literature concerned with the economics of education demonstrates the impact of parents' education on the educational and general development of their children (Jerrim and Macmillan 2015).⁷ This long-term channel is illustrated strikingly in Japanese history, where exceptional efforts were made from the late 19th century to educate the whole of their population, including women, motivated by the presumption of the spillover effects attendant on the upbringing of children by educated mothers. This economic spillover is regularly referenced in the context of the new economic growth literature, as is the presence of spillovers of technological knowledge in the growth process. Yet neither phenomenon has impinged itself upon the HCT literature, with its continued marginalization of external effects on learning. As Robert Lucas writes: "...human capital accumulation is a *social* activity, involving *groups* of people in a way that has no counterpart in the accumulation of physical capital" (Lucas 1988, 39; italics in original).

A fifth spillover channel for education is manifested in public goods. Thus, the enhanced knowledge of individuals in society may spill over to others due to non-exclusionary aspects in the consumption of culture (Nussbaum 2010). For instance, the well-educated adult population of New York City in the 1960s supported a range of commercial and listener-supported talk and music radio outlets.⁸ The cognitive and cultural benefits of the presence of these high-quality outlets, designed to service the well-educated, also accrued to others, such as working-class young people: the latter were free riders who were not the immediate targets of the commercial advertising and appeals for funds that sustained these stations. Universities, publicly displayed art and architecture, and other amenities function, and can be motivated, in a similar way (Nussbaum 2010; Marginson 2011; Williams 2016).

Beyond these direct economic spillovers, education has external effects on culture, political participation in democracies, citizenship (and, in a reverse sense, on crime), and most broadly, forms of socialization (e.g., McMahon 1999; Mayer 2011; Wantchekon, Klasnja, and Novta 2015; Croke et al. 2016); its effects on health are at once both private and external (e.g., Bhattacharjee and Joshi 2020). These outcomes may then have indirect economic effects, such as through the benefits of a fitter workforce or via behavioral outcomes. The ways in which these supposedly noneconomic considerations permeate and inform economic outcomes have not been integrated into the modern economic literature, but rather tend to be relegated to the category of differences in "culture" between, especially, national groups.

2.1 | Mainstream Marginalization of Externalities

These direct and indirect economic externalities from education and learning are a potentially huge fault-line in the edifice of HCT, coloring the scientific interpretation of the empirical links between education and economic growth, and undermining its

normative proscriptions for education policy. How does the mainstream economics literature deal with the manifest presence, throughout human history, of the external effects of individual learning across society? What is at stake, is not whether HCT acknowledges externalities in principle—it manifestly does, and indeed externalities typically get a mention in introductions to the subject. Rather, our critique concerns the marginalization of externalities in research, discourse, and public policy, relegating them to a footnote in the literature. Much research is devoted exclusively to the private returns to education in all its forms and stages. The approach to externalities has been, overall, dismissive. Surveys of the education–economic growth literature discuss the question of the external effects of learning in a brief and perfunctory manner.⁹ The same is true of the training provided to economics students through standard textbooks: external effects of education are treated as an afterthought, and then sometimes only to suggest that signaling may be important and that therefore externalities may be negative (e.g., Case, Fair, and Oster 2019; Begg et al. 2020; Borjas 2020). That externalities are marginalized within the HCT literature is also shown in the low number of empirical studies of education externalities, in contrast to a ubiquitous focus on private returns in the wider literature on the economics of education. A search of the 172 papers on the economics of education in eight leading economics journals during the 2010s decade, after filtering on whether the phrases "externality", "externalities" or "external effect" or "external benefit" or "external cost" or "spillover" featured in the title, revealed just three concerned with externalities; another eight were revealed when the search was extended to all fields: altogether 6% of economics of education papers in these journals.

This quantitative and practical marginalization of externalities in research, treating the issue from an individualistic perspective, then citing "exceptions" in which externalities are present, is assuredly not supported by this small volume of existing evidence. Among these papers, the majority report estimates or calibrations that imply a high positive magnitude of external economic and noneconomic effects of education, though with estimates varying according to level and context (e.g., Moretti 2004; Choi 2011; McMahon and Oketch 2013; Wantchekon, Klasnja, and Novta 2015), while some report insignificant estimates (Acemoglu et al. 2001; Sand 2013). Yet these estimates should be regarded as a lower bound to the externalities associated with education because they are largely associated with proximate, "neighborhood" effects and generally do not seek to capture the potential long-term spillovers noted above. With significant chain reaction effects across generations, and across evolving sectors, an exclusive focus on contemporaneous impacts will fail to capture the full effects, even with respect to the trajectory of measured GDP. It will prove impossible, for instance, to give an adequate exposition of the economic history of Japan in the 20th century without recognizing that the pursuit of formal education with a western orientation in the post-1868 period played a central role in the society's transformation, accelerating in the 1950s to world-class levels of economic development and technical sophistication.

3 | Consequences for Economic Analysis

Moreover, the marginalization of the external effects of learning in HCT has important consequences for a number of fields of

economic and social enquiry. Of these, we shall briefly discuss five: the underestimation of the significance of macroeconomic hysteresis, misspecification of the benefits of trade, the underestimation of the social (and especially long-term) value of education, short-termism combined with over-emphasis on incentive-based solutions for education policy, and the futility of efforts to estimate the “human capital stock”.

First, the marginalization of social effects in the HCT context inhibits the recognition of the full consequences of macroeconomic hysteresis, with unemployment scarring workers through de-skilling and creating impediments to learning, productivity growth, and economic development. Disutility from the underemployment of labor in, especially, rural areas, as focused on in the literature of economic development (Lewis 1954), is only reinforced by the incumbent absence of the learning-by-doing effects so emphasized in the new economic growth conceptualizations; severe poverty has similar consequences for productivity by undermining the health of the workforce. Furthermore, a region’s mass unemployment makes for a (well-nigh irreversible) destruction of its “communities of work”. Thus, strategies for economic growth that embody a high risk of downturns may well be more costly than they appear, at first, on the basis of standard economic calculations. The costs of an economic downturn cannot merely be measured as the income foregone, but should also include a calculation of the social capital (permanently) destroyed (Cerra, Fatás, and Saxena 2023; Walentin and Westermarck 2022; Arthi 2018).¹⁰ Thus, the deprivation that takes place within an economic downturn is an issue impinging not only upon human welfare, but also the trajectory of development of the economy.

Second, the problem of the individualistic treatment of education and the acquisition of workforce skills also has implications for optimal trade and outsourcing policies. Thus, international outsourcing might be an optimal strategy for an individual firm, but socially suboptimal if it leads to industry-wide skill losses in national or regional “communities of learning”. Such losses might be irreversible, and thus a further source of regional or national hysteresis (Auerbach and Skott 1995). Whether a free flow of overseas investment or outsourcing has a desirable outcome for the domestic economy of a nation is likely to be contingent on particular circumstances; the presumptions of orthodox HCT, however, tend to preclude consideration of such circumstances.

Third, a direct consequence specifically for education economics is the likely underestimation of the social returns to education. Long-term returns, especially, may be undervalued owing to the long lags in externalities which the marginalized research noted above is only recently beginning to uncover. Relatedly, the relative returns to particular types, streams, or levels of education are likely to be distorted if viewed only through the lens of private benefits and costs. Research on the relative external benefits of different education types is extremely rare. Indeed, the prevailing view, even among critics from outside economics, seems to have been that social returns are lower than private returns because education is deemed to be mainly a positional good, conveying social and economic status rather than making people more productive (Di Stasio, Bol, and Van de Werfhorst 2016). In essence, this is to argue that the external effect of education is negative. In our view, this argument, at least in its pure form in which education is seen as *only* positional, is not defensible in light

of evidence for education’s direct effects on productivity and economic development.

Fourth, this underestimation and distortion of the value of education lead to a mis-specified approach to education policy. A disregard of the external effects leads governments to base their funding policies exclusively on evidence of private returns to the levels or types of education, or to particular subjects (as witnessed by the denigration of arts education). Disregard of long-term lags fosters a short-termist approach to education and training that targets the development of specific, and often quickly obsolescent skills. HCT-inspired public policy is thus inclined to give less focus to a strategy oriented around a broad-based culture of learning across individuals and to emphasize the cultivation of workplace-ready skills at the individual level. This short-termist orientation is reinforced when young people, in the context of human capital-inspired policies, accumulate substantial indebtedness as students (Looney and Yannelis 2024). Such an orientation will be deleterious both for society as a whole and at the individual level by discouraging the cultivation in young people of fundamental skills that will offer flexibility for a lifetime of work. This individualist perspective on education policy, sometimes referred to as “neoliberal responsabilization” (e.g., Argent, Brown, and Kelly 2022), complements the self-entrepreneurial orientation on human development emanating from the Chicago school (Hacker 2008).

Fifth, the marginalization of social context has also permitted the advancement of a radical accounting practice: as an alternative to education- and health-based measures (e.g., Lim et al. 2018), we observe an earnings-based measure of the human capital stock of nations following an original suggestion by Jorgensen and Fraumeni (1989). The earnings-based measure is the only one of three measures that is explicitly built on (rather than just motivated by) HCT, the alternatives being derived from educational achievements or costs. It computes the stock as the discounted value of present and future expected earnings streams for people of each age, sex, and level of education (Abraham and Mallatt 2022; World Bank 2021, 145–147; Liu and Fraumeni 2020). Validation exercise attempts have been made, with mixed success, to reconcile earnings-based capital stock measures with the other measures. Large disparities in estimates of the magnitude of aggregate returns between cost-based and earnings-based approaches (Abraham and Mallatt 2022, 116) suggest a state of disarray. Recent attempts to resolve this tension have prompted a movement away from the individualistic premises of HCT: Jones (2019, 1176), for example, notes the amplification of the value of workers’ skills that can take place through “complementarities across workers”, thus hinting at the presence of external effects of learning discussed above. Income-based accounting measures of the human capital stock may be compared across socioeconomic groups or countries. Largely absent, however, are any serious attempts to use the estimates to help explain economic development—ironically, one of the core original motivations for HCT. This abstention is unsurprising, considering its self-evident danger of being wrapped in tautology: earnings are a major component both of GDP and also by definition of the earnings profiles on which the income-based human capital index is built.¹¹ Yet, if earnings-based accounting measures are not used to aid understanding and policy, their scientific utility seems limited.

These five consequences of deploying methodological individualism to analyze the relationship between education and the economy as a whole through HCT illustrate the general problem in which the paradigm finds itself: its inability to overcome, rather than ignore, the inherent tensions of a theory which allows for externalities in principle but marginalizes them in most of its uses and normative prescriptions. Viewed from outside the economics profession, an analysis of the provenance and impact of learning in society that became so focused on the supposedly autonomous decisions of individuals might seem bizarre and take some explaining. This marginalization of external effects in neoclassical economics is ironic, since their introduction early in the 20th century by Pigou (1920) remains one of the leading innovations in the economics of that era. Yet the scholastic impetus for this individualistic focus and marginalization of externalities in mainstream economics stems from an intensification, in the post-war world, of the desire for a rigorous analytical foundation for microeconomics based on rational choice, and the wish to avoid confronting this tension, as much as from any ideological impetus. Endogenous preferences and external effects complicate the construction of rigorous formulations of general equilibrium and preclude any simple notion that free market solutions are necessarily socially optimal. For HCT, the presence of substantial education externalities potentially alters the dynamics of growth and development in multiple ways, while critically undermining the simple normative prescriptions that stem from its individualistic approach.

4 | The Problem of Incomplete and Imperfect Markets for Education, Training, and Skilled Labor

In addition to the problems encountered by framing the relationship of education and training to the economy through the lens of methodological individualism, further problems arise because HCT needs to make strong assumptions about the functioning of both education and skilled labor markets.

For HCT to be viable as an approach to understanding the dynamics of education provision and demand, a prerequisite is the assumption that there are well-functioning markets for education and training services, as well as for educational outcomes (i.e., skilled labor). Such a prerequisite may not be part of the core of the paradigm, but HCT would have no realm of application without these markets.

For much of modern history, education has been both controlled and provided by states, with the market's realm applying predominantly to marginal, often elite institutions, and more generally to the provision of training services. In the modern, neoliberal era, market forces have been introduced in many countries. Central problems arise, however, from the long-term nature of the benefits from education, and from the market's ignoring of external effects. This long-term nature implies that the usual dynamics of supply and demand may fail to materialize, leading to potential sustained disequilibria in the supplies and demands of educated labor, and associated instabilities. Private "over-education" or "under-employment" is one manifestation of this dynamic, arising from a growing, unrestricted demand for credentials. In most countries, substantial and increasing

proportions of those with college-level education are in jobs that do not require their attained level of education, with exceptions applying to countries where the state closely controls the supply of higher education, matching it to the expected growing demand for college-educated labor (Green and Henseke 2016, 2021). Yet this fact fails to operate as a timely check to contemporary education decisions by new generations. The manifest reality of over-education was treated in education economics as an anomaly for HCT (McGuinness 2006). With the failure to resolve that anomaly, however, the concept has come to be displaced by the concept of skills mismatch (Quintini 2011). Although there was broad agreement that education mismatch should be distinguished from skills mismatch, these two concepts have come to be treated as virtually orthogonal in policy circles. The consequence is a near-silence on the implications for HCT of educational disequilibria. In effect, there arises thus a disconnect between conceiving education as a market and treating the markets for educated labor in terms, not of achieved education, but of skills. The persistence and the potential consequences of overeducation for wages, job dissatisfaction, and wider forms of social discontent continue to be revealed across yet more countries (e.g., Sanchez-Sanchez and McGuinness 2015; Meroni and Vera-Toscano 2017; Kang and Mok 2022), but are absent from the purview of HCT.

The possibility of imperfect labor and product markets also put some HCT predictions about the determination of wages in question. Models of job queuing in partially segmented labor markets have helped to explain dualities in labor markets that were not envisaged within HCT (Piore and Sabel 1984). Subsequently, recognition of imperfect competition problematized Becker's assertion that employees would pay for their general training. The consequence of wage compression within firms, or of there being only a few firms in an industry where newly acquired transferable skills could be deployed, meant that employees would not fund the full cost of such training, and that training becomes sub-optimal (Stevens 1994; Acemoglu and Pischke 1999). HCT's implications for training have not therefore proved especially fruitful for policy purposes.

With well-functioning skilled labor markets, HCT also leads to an explanation of wage distribution that has, through the well-known Mincer equation relating wages to education and work experience, and the parallel application of supply and demand analysis, framed the understanding of wage inequality. In HCT's perspective, workers' relative wages reflect their productivity, which is determined by their skill. Indeed, the notion that skilled workers are paid more than unskilled workers seems uncontroversial. And yet, it is a major step from this notion to asserting that *all* wage variation is attributable to human capital variation. In empirical approaches to the issues surrounding gender discrimination, HCT is one of the various explanations used to reduce the perceived estimate of the proportion of the gender pay gap that is attributable to discrimination: part or all of the gap is seen in HCT as due rather to differing investments in employment by women and men. However, neither investments in education nor educational outcomes can be assessed in gender-neutral ways and the model's underlying notion of rational choices made against the backdrop of a gender-neutral playing field is problematic (Lips 2013).

In a similar way, even a careful parsing of the causes of racial wage gaps between HC and discrimination (e.g., Gyimah-Brempong and Fichtenbaum 1997) will prove inadequate. Inter-twined with HCT are a whole array of associated aspects that touch on the racial dimension: the racial aspects of the differential effects of labor hysteresis and unemployment (Gabriel and Schmitz 2020), the effects of redlining in housing on ill health (McClure et al. 2019), and the problems generated for the upbringing of children, among a range of other issues when these questions are placed in a social context. To deal with such issues a multilateral approach that moves beyond individualistic HCT is needed (Fugazza 2003).

5 | Moving On: Toward Reframing the Agenda for Economics Research on the Education–Economy Nexus

Since its inception, HCT has persisted for six decades in the teaching and practice of economics. In the eyes of many critics, however, HCT has proved unable to provide a satisfactory scientific account, either of the linkages between education and the economic and social environment, or of the effects of education on economic and social outcomes. The criticisms, largely from outside the discipline, are recurrent. Yet these are often piecemeal, and often do not reach the core of the paradigm, and give little if any weight to the importance of external effects. The contribution of this paper is to reframe the critique of HCT, centering it on the tensions that arise from two relegations to the margin. Although expositions of HCT may sometimes give formal recognition to the presence of external effects, these effects are systematically marginalized from consideration in the bulk of empirical work and policy advice. Similarly, marginalized are the social determinants of education demand. The resultant tensions from the use of an individualistic methodology to try to explain inherently social phenomena have been accommodated within HCT by ignoring them. The outcome is problematic in many important fields of economic enquiry, of which this paper has noted several examples. The issue is not that there has been a decisive rejection by a singular empirical finding or set of findings (Blaug 1976b), but that HCT has ceased generating substantive new testable (and tested) hypotheses that deepen understanding of the education–economy nexus.

If economics were to forsake its methodological individualistic approach to understanding education, what form would a reformed approach take? Although some critics would object to the continued use of the term “human capital” as a synonym for human capabilities or skills, we do not call for its abandonment, because its use is irretrievably embedded in the language of social scientists and general public discourse. But use of the term must be distinguished from an endorsement of “human capital theory” which proposes a specific and, as we have argued, inappropriate set of relationships between education and training and the economy.

In place of HCT in its present form, there are within economics three extant complementary approaches that could be developed to move forward the understanding of the education–economy nexus that underpins the training and practice of economists in public life and improve the basis for policy-making: the analysis of education spillovers, the capability approach and the behavioral

economics of education. Although the emerging externalities literature and the capability approach both enlarge the concept of what education produces, behavioral economics promises and delivers plausible theory and evidence on the demand for education and learning.

A greatly enlarged program of research is needed to uncover and estimate the heterogeneous magnitudes of educational externalities—both economic and noneconomic—across all educational and training stages, across subjects and heterogeneous sectors, countries, and developmental stages. Given the prevalence of long-term market disequilibrium, these external effects should also be examined as well for those who are overeducated for their jobs (Green and Henseke 2016). As noted above, research on external effects may need to draw on historical as well as conventional econometric and quasi-experimental methodologies. Moreover, it can benefit from the emergent, creative deployment of “big data” gathered from as-yet unforeseen sources, as well as from administrative data linking in health and other nonmarket outcomes of education. International research on externalities could be driven by appropriate international research agencies such as the OECD, and studies of the implications for policy should follow. Education and learning are deeply embedded social processes, whose provenance and effects must be examined across a broad range of societal contexts, with appropriate consideration of the unfolding of these processes through time.

The capability approach developed by Sen (1997) and Nussbaum (2010) reformulates the objective of economic development as the pursuit of freedom and agency and moves beyond the individualistic perspective of the HCT. It replaces a utilitarian focus on material progress, broadening it to include increasing people’s capabilities—which are the freedoms people have to choose and to act. It follows that an understanding of educational decisions by individuals should be framed in relation to the broader incentives of acquiring agency and other capabilities, rather than to conventional utilitarian objectives. The capability approach embodies a critique of HCT for deploying an entirely instrumental concept of education, one which devalues both its intrinsic worth and its influence on societal outcomes, most especially with regard to gender differences (Robeyns 2006). Although neoclassical economists may respond that nonutilitarian conceptions can be incorporated by HCT into the lifetime utility function, in practice they are, like externalities, marginalized to the point of practical exclusion in theoretical presentations and much of the policy discourse.

The capability approach also places the social context of education at the center, rather than at the periphery of the analysis, because the social context determines how resources are converted into capabilities, and how these capabilities are “converted” into functioning (what people are and do) (Chiappero-Martinetti, Salardi, and Scervini 2019; Powell and McGrath 2014). Economics could join with sociology and psychology in analyzing how individuals’ aspirations and objectives are continually formed and reformed through the life course and within the socioeconomic environment. To do so, economists would need to forsake the individualistic emphasis of HCT; that framework, with its assumption of fixed preferences, has inhibited conceptual focus on the complementary roles of education and poverty reduction in economic growth and development, despite the

extensive empirical literature on this question for both rich and developing countries.¹² As Buzzelli (2015) notes, the capability approach to educational production implies an expanded research program to understand and identify the objectives set for education through the capabilities that are to be gained. A key consideration is how those capabilities are identified, whether top-down or via a democratic or participatory process. An understanding of the broader objectives and outcomes of education, beyond monetary gain for individuals, is forming part of this new research agenda (e.g., McGrath et al. 2022; Allah-Mensah and McGrath 2023) and will have important consequences for the economic analysis of education demand and hence of long-term labor supply.

To reframe the understanding of educational decision-making and learning choices, an emergent literature is also drawing on the interdisciplinary science of behavioral economics (Thaler 2017). That literature starts from the empirical failures of standard optimization approaches, most especially in the context of a world of less than perfect certainty, and marks a *sotto voce* reintroduction of the pre-Friedman (1953) criterion of descriptive realism in economics. The literature directs attention to the coping strategies needed especially for making complex dynamic choices, such as in education (e.g., Thaler 2017; DellaVigna 2009). Studies of the behavioral economics of education reject the fundamental assumption of fixed exogenous education preferences that lies at the heart of HCT, focusing instead on traits and behaviors induced through loss aversion, differentiated self-control, limited attention or cognitive ability, projection bias, identity effects, family backgrounds, and the power of social norms (Jabbar 2011; Koch, Nafziger, and Nielsen 2015; Lavecchia, Liu, and Oreopoulos 2016; Leaver 2016; Damgaard and Nielsen 2018). Behavioral economics is thus being applied to analyze participation in early childhood development programs (Serván-Mori et al. 2022), and to understand learning behaviors in specific vocational contexts such as medical training (Sullivan 2020; Liu et al. 2022). These examples can be generalized across education more generally. Perhaps because behavioral approaches have their origins in a literature oriented toward the psychology of individuals, these approaches have not yet realized their potential for dealing with a range of human decisions in the context of class and gender differentiation. Nevertheless, in what has been termed a “second wave” of behavioral economics, it is recognized that social constructs affect choice sets (Hoff and Demeritt 2023)—a framing similar to the role ascribed by the capability approach to social context. Evidence is mounting that most behavioral biases in education are strongly differentiated by social background. Thus, this growing literature has the potential to develop a theoretical and empirical alternative to the standard HCT explanation (based on the *deus ex machina* of credit market imperfections) of differential access to educational investment according to social background (Galor 2011; Caucutt and Lochner 2020). With such an approach, economic policies for the stimulation and improvement of education and learning are no longer constituted by strategies to elevate the efficacy of educational quasi-markets but could draw instead on “behavioral-economics-enhanced” strategies to “improve” choices and behaviors (Gennetian et al. 2019; Weijers, Koning de, and Paas 2021).¹³

Given the tensions into which methodological individualism has driven the HCT paradigm, we suggest that, alongside the

development of research on education externalities, a scientific renewal of theory in this field could and should take place in the context of the use of both the capabilities and behavioral economics approaches. The notion that education can be treated in the same manner as any other commodity, as merely an aspect of a “unified field theory” of microeconomic allocation based on individual choice, ought to be abandoned; the unique role of education in economic and social life and in personality formation should be recognized and taught to economists as part of their training. The success or failure of an educational policy cannot be properly justified only by examining evidence on the increments to individual incomes resulting from such policy. The provenance and effects of education and learning must be examined across a broad range of societal contexts, with appropriate consideration of the unfolding of these processes through time. The individualistic focus of HCT should be rejected as the central methodology for studying these phenomena.

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Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the arguments developed in this paper.

Data Availability Statement

The data on Web of Science search results are available from the corresponding author (Francis Green) on request.

Endnotes

¹It is ironic that, a quarter century later, the nation would wring its hands over the “problem of human capital”, and a Business week special would call for more federal and state education spending to address skills shortages (Business Week, 18/9/1988). After half a century, the merits of public interventions on early years’ education would be heralded (Heckman et al. 2013).

²As of January 2023, this article had been cited 295 times in Web of Science-recognized journals, an exceptional number for a review article.

³Derived via Web of Science from a search of the same journals, with identical search conditions as in Machin (2014): education, school, schooling, or human capital; and excluding comments and errata and AER papers and proceedings. The journals covered are American Economic Review, Economic Journal, Econometrica, Economica, Journal of Political Economy, Quarterly Journal of Economics, RAND Journal of Economics, and Review of Economic Studies.

⁴Although there have been holdouts for the dominance of innate, or biological characteristics (Plomin 2018), the dominant view in biology is that “the dichotomy between characteristics in an organism that can be defined as genetic or innate and those acquired from an external environment is a ‘folk understanding’ of a process that in fact involves the continuous interplay of the organism (and its genes) with its environment”. As a result, “... the underlying assumptions of contemporary psychological models reflect largely outdated ideas about what it means for something to be innate” (Bateson and Mameli 2007); see Auerbach (2016), chapter 11.

⁵Stiglitz and Greenwald (2014, 165) write: “The existence of spillovers... means that those engaged in learning cannot appropriate for themselves the full social benefits of learning, both today and in the future... Learning today, for instance, provides a higher base off from which future learning starts... those engaged in learning and research today will fail to take into account these benefits”.

⁶See Michael (1972) and Porter (1990), p.145: “A nation’s firms which lack sophisticated home buyers... face grave difficulties in innovating more rapidly than rivals who possess them.” Certain forms of economic development, most especially those associated with urbanization, can lead to losses in traditional knowledge about food and diet formerly possessed by a (supposedly uneducated) largely rural population, as well as so-called folk traditions in music and art.

⁷Chalfin and Deza (2019) note that previous analyses ignoring the intergenerational benefits of education on crime in the United States have, as a result, appreciably underestimated the full benefits of investments in education.

⁸The stations included commercial ones such as WNCN, WQXR, and WEVD, the listener-sponsored WBAI, as well as noncommercial stations such as WRVR, WKCR, and WNYC; the British equivalent of the latter would have been the output of the BBC, most especially the Third Program (now known as Radio 3).

⁹For some representative examples, see Sianesi and Van Reenen (2003, 160–161), Hanushek and Woessmann (2008, pp. 615–616), and Folloni and Vittadini (2010, 261–262).

¹⁰The rejection of the concept of “social capital” in the mainstream of economic research, which had been meant to fill the gap left by the individualism of the mainstream human capital approach, was signalled and received perhaps its decisive blow in the articles contained in Dasgupta and Serageldin (2000), leading within a decade to the marginalisation of social capital within economics: what had been taken to be the successful analogy between tangible capital and human capital in orthodox economics was seen to break down in the case of social capital—“what is social capital the stock of?... Any stock of capital is a cumulation of past flows of investment... How could an accountant measure them and cumulate them in principle?” (Solow, 2000, 6–7). The demotion of the concept even in applied contexts can be seen in the query in World Bank (2021), p.403: “Is Social Capital Really Capital?”, all of which implicitly accepts, by contrast, the “success” in the measurement of the individualistically-conceived human capital stock. The gap left by sole reliance on the individualism of the mainstream human capital approach is a real one; however, and to the present day we observe attempts by the mainstream to fill this gap with a range of institutionalist and other solutions (Fehder, Porter and Stern 2019).

¹¹This issue is nowhere mentioned, to our knowledge, in the literature. A parallel is found in the critique of the similar use of accounting identities in the context of physical capital in the aggregate production function literature (Felipe and McCombie, 2013).

¹²For rich countries, see Schütz, Ursprung and Woessmann 2008, 304–305, OECD (2010, 167–168), and Flood et al. (2022); for developing countries, see Wade (1990), Yoong-Deok and Kim (2000), and Amsden (2001). For an overview, see Auerbach (2016), chapters 6 and 10.

¹³The normative, perhaps Orwellian, tone to any such “improvement” recalls; however, the necessity for a democratic underpinning to any behavioural strategies for education.

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