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Provisioning for sufficiency: envisaging production corridors

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ABSTRACT

This article deepens the framework of a *sufficiency economy*, defining sufficiency as the space between a floor of meeting needs and a ceiling of ungeneralizable excess. This framework can be applied to the domains of consumption and production. Complementing existing research on consumption corridors, our aim is to conceptualize the idea of a *production corridor*. To develop this notion, we survey a range of helpful concepts starting with objective and universal human needs to establish a “floor” and planetary boundaries to establish a “ceiling.” We then assess in some detail a range of conceptual debates that pertain to production: 1) Marxian categories of labor, 2) the production boundary, 3) provisioning and the foundational economy, 4) social reproduction, and 5) unnecessary labor. These debates permit us to start identifying *essential production*, which enables the satisfaction of human needs within planetary boundaries, and *excess production*, which contributes neither to need satisfaction nor human flourishing but drives planetary overshoot. This distinction further allows for an “in-between” domain of the economy, situated between the floor and ceiling. This discussion concludes with a more detailed model of production embedded in the framework of the sufficiency economy. We then “dynamize” this model to sketch a production corridor under climate-mitigation imperatives. It considers in turn the essential economy, the excess economy, and the in-between economy. The final section summarizes our depiction of the production corridor leading to rapid but fair decarbonization of the economy.

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Introduction

Recent crises, with pandemic shutdowns and reduced gas supplies from Russia, have raised questions of the purpose of the economy and the nature of economic value. Which sectors can(not) be shut down during a pandemic and which are prioritized if gas needs to be rationed? What activities have value, are essential to survival, well-being, and justice in some way? And what activities are not critical to these endeavors, maybe even wasteful or destructive?

To address these questions, we build on Ian Gough’s (2017, 2022) framework of a *sufficiency economy*. This approach defines sufficiency as the space between a floor of meeting basic needs and a ceiling of ungeneralizable *excess* (with acknowledgements to Kate Raworth’s (2017) “doughnut”). The sufficiency economy assumes an objective and universal concept of human needs to define a lower limit or “floor” (see Doyal and Gough 1991; Gough 2015, 2017) and the concept of planetary boundaries to define an upper limit or “ceiling” of

unsustainability and excess (see the following section). This framework, and the sufficiency principles that underlie it, can be applied to the domains of consumption and production, as illustrated in Figure 1.

Recently, the consumption domain has received increasing attention via the concept of “consumption corridors,” defining consumption minima (allowing every individual to live a good life) and maxima (ensuring a limit on the use of natural and social resources) (Fuchs et al. 2021, see also the collection on “consumption corridors” in this journal¹). A “corridor” denotes a three-dimensional space, which only makes sense if it entails a journey through time. Thus, in our view, the term “corridor” implies a temporal dimension—it indicates that such a sufficiency economy cannot be achieved overnight but entails a long and difficult process over time. Furthermore, the concept of consumption corridors highlights that consumption cannot be properly understood by studying individual consumer choices but needs to be interrogated by engaging with “the

Wellbeing domain	Consumption domain	Production domain
Excess	Luxuries	Excess production
Flourishing	Conventional goods	'In-between' production
Needs met	Necessities	Essential production
Deprivation		

}

Ceiling

Sufficiency

Floor

Figure 1. The sufficiency economy. *Source.* Based on Gough (2021).

structures in which they are embedded” (Di Giulio and Defila 2021, 122). However, despite this realization, research on consumption corridors has less to say about the *production* of overconsumption/excess (but see Pirgmaier 2020). It understates that consumption is a “necessary induced outcome of a productivity- and growth-driven production sector” (Brand-Correa et al. 2020, 309), linked for example via “work-and-spend cycles” (Schor 2008) that channel long working hours and labor-productivity gains into ever-increasing consumption. Similarly, it understates that production decisions (e.g., as regards investment, technologies, use of labor), which entail certain social and ecological impacts, are evidently taken by those who own and manage the means of production under certain political economic conditions, and not by final consumers (see “Treadmill of Production Theory,” e.g., Gould, Pellow, and Schnaiberg 2004).

Hence the main purpose of this article is to apply the corridor concept to the domain of production: to conceptualize and operationalize the idea of a *production corridor*. Enlarging the scope from consumption to production enables us to better understand climate change as class struggle, as power over the economy lies with those who own and control production (Huber 2022). It is also necessary because, as Hoffmann and Spash (2021, 9) highlight, even debates on “selective degrowth” hardly address “what kind of work [*and production*] exactly may be identified as un-/necessary, harmful, un-/sustainable or otherwise un-/wanted” (italicized text is ours).

Attempting to conceptualize production corridors, we largely enter uncharted territory and, accordingly, this requires some caveats. First, this article is primarily conceptual; empirical estimates and policy proposals will be selective, nonsystematic, and exemplary only. Thus, second, we aim at nothing more—and nothing less—than providing a solid basis for further conceptual work as well as for sector-specific analyses on production corridors. Third, and relatedly, the scope of this article does not allow us to discuss whether and how democratic agreement can be reached on corridors; that is a separate issue to be addressed on another occasion (but see e.g., Hammond 2020; Gough 2022;

Bärnthaler 2023b for some reflections). Rather we ask how production priorities need to shift over time to secure a transition toward an economy of sufficiency. Such a question raises, finally, a host of other difficult questions, and two huge ones in particular: Do we assume the end of capitalism and of the world system of nation states in the near future? The answer to both is “no.” We are, by definition, investigating a *transitional* strategy (*toward* a post-capitalist/post-growth world of steady-state economies); one that must happen very rapidly starting from now. Thus, even though capitalism might indeed be at odds with corridors (Pirgmaier 2020), strategies to establish them start within pre-existent institutional contexts, within a pre-structured world, and seek to transform it (Bhaskar 1998). We must therefore start our analysis within these two integuments.

We begin in the next section by selecting and surveying literature on existing concepts that are helpful for distinguishing the production floor and ceiling. It concludes with a more detailed model of production embedded in the framework of the sufficiency economy. The following section then “dynamizes” this model to sketch a production corridor. It considers in turn the essential economy, the excess economy, and the in-between economy. The final section of this article summarizes our depiction of the production corridor leading to rapid but fair decarbonization of the economy.²

Surveying key concepts to identify the production floor and ceiling

Our definition of “floors” and “ceilings” relies on an objective and universal concept of human needs and on the concept of planetary boundaries, respectively. The link between universal human needs and the limits imposed by a finite planet is essential: in a world of egregious inequality, both between and within countries, it will not be possible to meet the basic needs of all people without imposing limits on certain forms of excess (Gough 2017). Thus, the following subsection briefly introduces both concepts, highlights their interrelation, and bridges this debate to the domain of production. The subsequent subsection screens diverse debates that can inform

meaningful conceptual distinctions and priority-setting as regards production in a sufficiency economy.

Establishing floors and ceilings: human needs and planetary boundaries

Doyal and Gough (1991) contend that any coherent evaluation of the human condition requires a notion of universal and objective human needs. The universality of needs rests on the belief that if they are not satisfied then serious harm of some objective kind will result. This, among others, distinguishes them from preferences. On this basis, Doyal and Gough (1991) identify health, autonomy, and participation as universal basic needs. However, like all need theories, they distinguish needs from need satisfiers, which are specific to place, time, and culture. For example, the needs for food and shelter apply to all peoples, but there is a large variety of cuisines and forms of dwelling which can meet any given specification of nutrition and protection from the elements. Theories of need provide the conceptual groundwork for a “floor” to consumption and production.

To determine ceilings or upper limits, two fundamental approaches can be distinguished: ethico-social and biophysical (Daly 1977; Koch and Mont 2016; Gough 2017). Socialist and other ethico-social arguments for limits to inequality have existed for centuries. In a recent revival, Robeyns (2017, 2019) has advocated “limitarianism”—the belief that it is not permissible to have more resources than are needed to fully flourish in life.³ “Riches” are, by her definition, surplus to flourishing (“excess” in our terminology). This enables her to argue for a maximum level of resources to devote surplus resources to meet “urgent unmet needs.” Such perspectives form part of the case for the pursuit of sufficiency. However, in this article, we concentrate on the reality of pressing planetary boundaries and their ethico-social implications.

The idea of “planetary boundaries” was advocated by Rockström et al. (2009). They have argued that there exists a series of biophysical “tipping points” where environmental systems undergo a non-linear transition which are likely not recoverable (Green 2021). This would threaten the bases of social development that have persisted throughout the Holocene. To prevent such a disaster, they advocate planetary boundaries, which do not follow directly from biophysical tipping points, but are also informed by collective judgments, such as “what is an acceptable degree of risk to human development of crossing a threshold, given

scientific uncertainty over the precise location of the threshold” (Green 2021, 3).

The scientific consensus on safe emission levels is moving relentlessly downward. Collectively, the pledges contained in “Nationally Determined Contributions” would result in annual emissions in 2030 that are 10.6% higher than in 2010; this global level of emissions would be consistent with average global temperature being 2.1–2.9 °C above its pre-industrial level by the end of this century (UNFCCC 2022). Since it is now empirically evident that increasing the eco-efficiency of production—in other words pursuing primarily orthodox “supply-side” strategies—has not led to absolute decoupling over extended periods of time and would very likely come too late to meet climate targets (Haberl et al. 2020), strategies to reduce demand, starting in the global North, have become imperative (Creutzig et al. 2018).

In 2022, the Intergovernmental Panel on Climate Change (IPCC) recognized this issue for the first time and started to grapple with the profound implications. Working Group (WG) III, Chapter 5 noted that demand-side strategies across all sectors could reduce emissions by 40–70% by 2050 (IPCC 2022, 117). It is notable that this chapter goes beyond *orthodox* demand-side measures, which—in line with neoclassical behavioral economics—have focused on individual consumer behavior (e.g., via improving market transparency and behavioral nudging). Instead, more structural interventions have gained importance. Based on the concept of “decent living standards” (DLS), Chapter 5 argues that demand-side measures to restrain consumption must be fair, and that this entails prioritizing universal needs over consumer preferences in some circumstances. Therefore, “minimum and maximum standards of consumption or sustainable consumption corridors” and “a distinction between necessities and luxuries” (IPCC 2022, 514, 524) are suggested to actualize the potential of living well within limits. Notwithstanding the mangled committee language, for the first time, the IPCC confronts the entrenched orthodoxy and officially endorses the idea of a sufficiency space. It marks a considerable shift in thinking from prior IPCC reports.

However, as Gerold, Hoffmann, and Aigner (2022, 13) rightly note, a sole focus on demand-side policies runs into danger of neglecting “the power of industries and corporations in shaping consumer behaviour and practices,” leaving production and its prevailing power relations largely untouched. A mere focus on demand-side mitigation (and consumption corridors) tends to understate the link between production and over-consumption/excess.

Moreover, tackling production directly can be ecologically more effective than detouring through “end of pipe” consumption. The prerequisite is, of course, to go beyond the supply-side orthodoxy (i.e., efficiency strategies) outlined above and instead, following the logic of WGIII/Chapter 5, to introduce additional sufficiency strategies. To do so, we need to distinguish between different forms of production to prioritize some over others.

Making conceptual distinctions in the domain of production

Neoclassical value theory regards all production that fetches a price in the market as productive. This is essentially all production in the capitalist domain of the economy, including self-employed and very small-scale producers. No other qualitative distinctions within production are countenanced: the production of armaments is no different from the production of food; the work of a nurse is equivalent to that of a hedge-fund manager. To depict an economy of sufficiency, we have no choice but to replace contemporary neoclassical value theory and its underlying liberal creed of “preference neutrality” (Carlin and Bowles 2020). The following section thus surveys alternative approaches that do make meaningful conceptual distinctions within contemporary economies. These include Marxian categories of labor; the “production-boundary” debate in national accounting; provisioning and the foundational economy; the reproduction debate; and concepts of unnecessary labor.

Marx on labor in the sphere of circulation, supervision, and non-/reproductive labor

Classical political economy, before the “marginalist revolution” of the 1870s, recognized a critical distinction between productive and unproductive labor. Marx likewise made this distinction and some of his insights have been rediscovered in recent decades, notably in the area of finance capital, supervisory labor, and luxury production. We consider each of these briefly.

First, Marx rejected Adam Smith’s distinction between material production and services as incoherent, but he retained a sharp distinction between labor employed in the production process and labor employed in the *circulation* process. Only workers employed in the production process were productive: “The pure functions of capital in the sphere of circulation...the acts of selling and buying—produce neither value nor surplus-value” (Marx 1966, 281). Marx was subtle here in distinguishing “pure

circulation” from labor working in aspects of distribution common to all modes of production, such as “storing, transporting, distributing, retailing” (Marx 1966, 282). This labor is productive. This crucial distinction has recently been rediscovered following the unprecedented rise of financialized capital over the past four decades (Mazzucato 2018).

Another Marxist antecedent relevant to the idea of a sufficiency economy concerns “supervisory labor” (Gough 1972). In all capitalist societies based on exploitation, layers of supervision have been imposed to control subordinate classes to ensure the production of surplus value and to maintain political stability. But again, Marx subtly distinguishes this “class” supervision from that necessarily required “to coordinate and unify the labour process” (Marx 1966, 23). Some coordinating and supervisory labor is necessary, but much is not. This distinction recurs in debates about “guard labor” below (Jayadev and Bowles 2006).

Finally, another, often overlooked, category relevant to a sufficiency economy concerns luxury goods. In the second volume of *Capital*, Marx (1967, 406–415) distinguished three “departments of production” producing respectively means of production, wage goods, and “luxury” goods. The latter are goods “which enter into the consumption of only the capitalist class” (Marx 1967, 407) and therefore do not re-enter the cycle of reproduction as elements of variable and constant capital. This distinction between reproductive and non-reproductive zones of the economy can contribute to rethinking a political economy of sufficiency (Gough 1975, 1979).

The production-boundary debate

The “production-boundary” debate refers to various contestations, starting in the 1930s, regarding the demarcation between activities considered “production” and those that are not. It highlights the social construction and theory-laden nature of national accounts. (Here “boundary” stands for “dividing line” and not, as in the case of “planetary boundaries,” for “limits”). Neoclassical value theory has been modified in practice at times of deep crisis, such as total war. During World War II, the exclusion of the massive wartime-state domain from productive activity could no longer be tolerated. The measurement of national resources became urgent and essential. Three methods of accounting for the “gross domestic product” of a nation emerged: the income method, the expenditure method, and the production or value-added method. The third method then raised the question: what counts as production? This quickly led to the distinction between final output

and intermediate inputs: to avoid double counting, the value of the baker's bread must subtract the value of the purchased flour, the value of the miller's flour must subtract the cost of purchased wheat and so on.

But what counts as *final* output? This was much discussed by Simon Kuznets and other economists working on constructing national accounts in the 1930s and 1940s (Coyle 2015). It was no longer possible to restrict this measure solely to the purchases of commodities by households; the production and consumption of the government domain—from education to armies—had to be included. But in the absence of market valuation, government services were valued on a cost basis. To avoid double counting this excluded government purchases of inputs from the capitalist domain, such as pharmaceuticals and weapons. The government sphere was thus measured by the wages and salaries of government employees alone (Mazzucato 2018). Already, the calculation of total production in an economy was moving away from the neoclassical theory of value. The continual modifications resulted in “a hodge-podge which combines marginal utility with statistical feasibility and some sort of common sense that invites lobbying rather than reasoning about value” (Mazzucato 2018, 100).

For example, it has led to the incremental inclusion of the financial sector within the production boundary. Broadly speaking, it was originally regarded as an intermediate cost to final output. Successive versions of the standardized national accounts (SNA) have incorporated more financial activity as a part of final product. By the 2008 SNA, almost the entire FIRE (finance, insurance, and real estate) sector was regarded as part of the productive economy. This inclusion within the “production boundary” has been critiqued from various perspectives (Christophers 2011). For example, Karel Williams and colleagues (CRESC 2009) argued that while enumerating its benefits, the costs associated with finance are ignored, causing considerable concern regarding its *net* contribution. Value extraction, especially in the form of rent, is a constitutive feature of the financial sector (Mazzucato 2018).

Another issue relevant to the production-boundary debate concerns the definition of “investment,” that can be financed by borrowing. The 2010 revision of the European SNA (ESA) reclassified military expenditure on weapon systems from public consumption/current expenditure to investment expenditure. At the same time, public spending on education, health, and care services remained

classified as current expenditure. The feminist economist Diane Elson (2016, 33) concluded that “[i]f ESA 2010 definitions are used as basis for the ‘golden rule’ it encourages governments to invest in death more than in life.”

Provisioning and the foundational economy

Over the last few decades, the concept of provisioning has offered alternatives to the monolithic/uniform understanding of production based on neoclassical value theory (Jonas et al. 2023; Bärnthaler et al. 2022; Fanning, O’Neill, and Büchs 2020). For example, those inspired by the “system of provision approach,” developed by Ben Fine and colleagues from the 1990s onward, interpret the economy as a network of *systems of provision* (Bayliss and Fine 2020) that transform resources into economic outputs and social outcomes (O’Neill et al. 2018). Suffice to say here that these systems structure production and consumption in distinct ways for different groups of goods and services: there is the food system, the energy system, the housing system, the care system, and so on. This moves us beyond a notion of the economy as a uniform space, as “One Big Market” (Polanyi 2001, 75), within which nameless and substitutable commodities are produced, exchanged, and consumed. Other approaches to “provisioning,” especially those inspired by a “social provisioning perspective,” strongly emphasize the need to take a substantivist view on the economy. In other words, we need to engage with *actually existing* economic formations (and its heterogeneous modes of provisioning) in order to investigate how societies organize their livelihood (Polanyi 1977). This, as Nelson (1993, 32) argues, “need not rule out studies of choice or of exchange but it does displace them from the core of economics. It does not rule out study of the provision of conveniences or luxuries as well as more basic needs, but it does not give them equal priority.”

This understanding of the modern economy has been deepened in the idea of the foundational economy. Drawing upon the writings of Fernand Braudel, the Foundational Economy Collective (FEC) conceptualizes the economy as composed of different zones: 1) the *world-market oriented, tradable, and competitive economy* for private purchases; 2) the *overlooked economy* for occasional purchases of mundane, cultural necessities; 3) the *foundational economy*, providing daily essentials; and 4) the *core economy* of unpaid care- and housework (Froud et al. 2018, 7). This classification enables prioritization of economic zones as the foundational economy is vital for everyday life and the satisfaction of

human needs (see also Gough 2020a; Bärnthaler, Novy, and Plank 2021). This includes the “material” foundational economy, such as energy, electricity and water, garbage disposal, food supply, and retail banking, and the “providential” foundational economy, essentially the entire “welfare state” plus other functions such as emergency services (FEC 2018). As well as being essential for social reproduction, foundational sectors differ from other sectors of the economy in two main ways: benefits are predominantly delivered through infrastructures, networks, and branches, as opposed to the purchase of individual commodities; and much is relatively sheltered from international competition. Yet over the past decades, significant elements have been commodified and financialized thus moving their delivery toward a capitalist logic (though see Kishimoto et al. (2020) for accounts of some successful decommodifying counter-movements).

The reproduction debate

The theoretical innovations of Karl Polanyi, James O’Connor, Nancy Fraser, and feminist political economy were to look behind Marx’s mode of production to its “background conditions of possibility,” thereby situating the capitalist economy within a broader concept of a capitalist-dominated “institutionalized social order” (Fraser 2014). Using a Marxist-Polanyian lens, Fraser identifies three non-capitalist background conditions: the entire planetary biophysical system (discussed above in the context of “planetary boundaries”); public goods and state power; and unpaid labor in households and communities.

State production is included in the national accounting framework discussed above, but Fraser’s conception is much wider: legal orders, property rights, repressive forces, money supply and management, infrastructure, crisis management, and so forth. This entails a more encompassing analysis recognizing the *reproductive* role of many state workers. O’Connor (1973) analyzed the threefold role of state expenditures in raising productivity (social investment), reproducing labor power (social consumption), and maintaining social harmony (social expenses). Gough (1975, 1979) went further in analyzing the reproductive functions of postwar welfare states: “It is quite wrong therefore to regard the growth of the state as an unproductive ‘burden’ upon the capitalist sector: more and more it is a necessary precondition for private capital accumulation” (Gough 1975, 80). Capitalism, as a mode of production, systematically relies on decommodified state provision, which secures well-being and safeguards

capital from its self-destructive tendencies (Bärnthaler, Novy, and Stadelmann 2023).

The role of “housework” and unpaid labor in the domestic domain was discussed in early exercises on national accounting but was excluded for a variety of reasons, including lack of data and valuation problems (Waring 1988). While this sphere of social reproduction often remains invisible and unpaid, it is of enormous *intrinsic* value. It is also a precondition for the existence of waged work, accumulation, and functioning societies: it reproduces labor power and secures well-being. Since the 1970s, (Marxist-)feminists have highlighted the essential, but structurally subordinated and appropriated, role of this unpaid and uncommodified reproductive domain, where labor is mainly undertaken by women (Bhattacharya 2017).

Unnecessary labor in the economy

Finally, to the distinctions between different domains/zones/sectors⁴ above, we must add another distinction: between *sectors* and *occupations* or *tasks*. Mapping sustainable employment, Bohnenberger (2022a) makes this important distinction, thereby differentiating between the macro-sectoral and micro-task level. This differentiation has implications for envisaging production corridors. At the macro-sectoral level, the crucial issue concerns the social contribution of a produced good or service (Does it contribute to need satisfaction, flourishing, or excess?) as well as its ecological consequences (Is it environmentally generalizable?). At the micro-task level, the crucial question is whether and how specific job-related activities contribute to the macro-sectoral outcomes. Any discussion of unnecessary production must consider both dimensions as within all sectors, even in the foundational zone, there are jobs that can be deemed unnecessary or otherwise problematic. Different conceptualizations of these jobs exist, for example Jayadev and Bowles (2006) concept of “guard labor” and David Graeber’s (2018) concept of “bullshit jobs.”

“Guard labor” refers to all forms of power exercised by private economic actors to “enforce property rights and pursue distributional advantage in private transactions” (Jayadev and Bowles 2006, 329). It comprises at least parts of supervisors, monitors, police, prisoner officers, public and private guards, and military personnel. From an anthropological perspective, Graeber (2018, 9) defines “bullshit jobs” as a concept that relies on worker’s self-evaluation of the jobs they do: “a form of paid employment that is so completely pointless, unnecessary, or pernicious that even the

employee cannot justify its existence.” He identifies five loose categories of “bullshit jobs”: flunkies (e.g., receptionists, cold callers), goons (e.g., armed forces, military contractors, lobbyists, public relations and advertising providers), duct tapers (temporarily fixing problems that could be fixed permanently), box tickers (e.g., quality and performance monitors), and taskmasters (e.g., supervisors, allocators, and creators of “bullshit jobs”). Future research could usefully complement this self-evaluation with more collective deliberative evaluations.

Interim conclusion: refining the sufficiency economy framework

We began this article by claiming that meeting human needs entails a production and consumption floor and ecological limits entail a production and consumption ceiling. This was illustrated in Figure 1. The subsequent survey of key concepts substantiated the requirement for floors and ceilings and zoomed into the sphere of production to explore meaningful conceptual distinctions that can inform the development of the production corridor.

As regards the production ceiling, the different “boundary” (read: dividing line) debates around Marxian categories of labor and national accounting have contributed much. In particular, they problematize the role of the financial, military, and luxury sectors, which undermine the provisioning of human needs and have problematic ecological implications. Rent extraction reduces the resource efficiency of human well-being, acting as a barrier to meeting human needs within planetary boundaries (Fanning, O’Neill, and Büchs 2020); an excessive military apparatus, and the sectors linked to it, produces death, not life (Elson 2016); and the production of luxuries exacerbates the contradiction between meeting human needs on a global scale and remaining within planetary boundaries (Gough 2017; Oswald, Owen, and Steinberger 2020).

With respect to the production floor, the debate on provisioning and the foundational economy highlighted the “material” and “providential” foundational economy as essential for the satisfaction of human needs. The reproduction debate underlined the core reproductive function of many state activities, while adding the unpaid sphere of social reproduction, also referred to as the core economy.

Cross-cutting these macro-sectoral/-zonal divisions is the micro-task-level debate on unnecessary labor. It is clear that unnecessary jobs exist in all domains, zones, and sectors, including the essential. As such, “unnecessary labor” can be considered a subcategory of what we might call “excess labor.” “Excess labor” encompasses all labor employed in excess production *plus* other unnecessary labor in the in-between and the essential domains.

Figure 2 breaks down the production domain from Figure 1 in more detail by summarizing the resulting components of essential, excess, and in-between production and by cross-classifying them with the three major domains that characterize substantivist approaches to economic analysis (Polanyi 2001): 1) the commodified, capitalist economy (dominated by market exchange), 2) the decommodified public domain (dominated by redistribution), and 3) the uncommodified domain of households and communities (dominated by householding and reciprocity). However, we should caution that this whole analysis concerns ideal types. In real economies, they often work together in hybrid ways, for instance in the form of public-civil partnerships, worker-owned cooperatives, commons, or limited-profit providers.

This outline clearly entails a fundamentally different idea of “an economy,” highlighting that certain zones, sectors, and occupations/tasks can be prioritized over others. With this framework in mind, the next two sections explicate in more detail the meaning of essential and excess production.

	Commodified	Decommodified	Uncommodified
Domain	<i>Capitalist</i>	<i>Public</i>	<i>Household and communal</i>
Excess production	Luxuries; much of finance; excessive military	Excessive military; extractive finance, infiltrating the decommodified domain	
‘In-between’ production	Remaining production for market minus unnecessary labor		
Essential production	Foundational economy (commodified) minus unnecessary labor	Foundational economy (decommodified) minus unnecessary labor	Core economy

Figure 2. Production in a sufficiency framework.

The production corridor

In light of the climate and wider ecological crises, contemporary economies must be decarbonized and restructured at dizzying speed to achieve the agreed goal of “net zero” by 2050, let alone absolute zero by 2035 (Ward et al. 2019). We must now move from a static analysis to a dynamic one and analyze the implications for production under climate-mitigation imperatives (for an initial attempt in this direction, see Bärnthaler, Novy, and Plank 2021). Accordingly, we reconsider first production in the essential and subsequently in the excess economy.

Rethinking the essential economy

We begin with a brief survey of *contemporary* portrayals of the essential economy. Figure 3 summarizes the *essential, critical* or *key* sectors identified by twelve countries in the global North at the start of the COVID-19 lockdown in March 2020. In many cases, the aim was to exempt such workers from general restrictions—often to allow their children schooling or childcare when schools were closed. They reveal a close degree of agreement on many sectors. Again, neoclassical value theory—for which such discrimination is anathema—has been overruled at times of severe crisis (Gough 2020a). We can use government actions during such crisis periods to illustrate how different countries have acted to ensure that core reproductive functions are performed. This provides us with a first glimpse of the scale of the essential economy today. The European

Parliament estimates the share of essential workers in the European Union (EU) to be about 42% of the total employed population, with most countries clustered around 40–45% (Samek Lodovici et al. 2021). This is the same range as the FEC (2018, 24) estimates of the foundational economy labor force (see also Krisch et al. 2020). What is missing from these accounts is the sheer amount of unpaid care work that also performs core reproductive functions and has markedly increased during the pandemic-period lockdowns, especially for women (Xue and McMunn 2021).

Problematizing “essential” sectors

However, much of what is considered essential today cannot be upheld in its present form under climate-mitigation imperatives. Recent government interventions are based on the societal importance of production “against the aim of not only meeting basic needs but upholding a certain kind of social structure: the functioning of the present type of society, i.e., of modern capitalist societies with their fossil fuel based, financialised, and growth-oriented economies and military-dependent, competitive nation states” (Hoffmann and Spash 2021, 22). Hence, rather than aiming at *reproducing* given social structures, what is “essential” must be re-assessed against the aim of *transforming* them (Bhaskar 1998) to be compatible with sustaining human life on Earth.

To do this, Hoffmann (2022) declares that all sectors, including essential ones, must be mapped against 1) their carbon-dioxide (CO₂) emissions, 2) fossil-fuel use per unit of sector output, and 3) the

	NZ	DE	IE	BE	US	ES	UK	CA	IT	NE	AU	FR	
Emergency services	*	*	*	*	*	*	*	*	*	*	*	*	12
Health care	*	*	*	*	*	*	*	*	*	*	*	*	12
Food/agriculture	*	*	*	*	*	*	*	*	*	*	*	*	11
Energy	*	*	*	*	*	*	*	*	*	*	*	*	11
Water/waste	*	*	*	*	*	*	*	*	*	*	*	*	11
Communication/IT	*	*	*	*	*	*	*	*	*	*	*	*	11
Transport	*	*	*	*	*	*	*	*	*	*	*	*	11
Media	*	*	*	*	*	*	*	*	*	*	*	*	11
Retail	*	*	*	*	*	*	*	*	*	*	*	*	10
Defence/national security	*	*	*	*	*	*	*	*	*	*	*	*	10
Care services	*	*	*	*	*	*	*	*	*	*	*	*	9
Government	*	*	*	*	*	*	*	*	*	*	*	*	9
Finance	*	*	*	*	*	*	*	*	*	*	*	*	9
Education	*	*	*	*	*	*	*	*	*	*	*	*	8
Justice	*	*	*	*	*	*	*	*	*	*	*	*	7
Manufacturing input	*	*	*	*	*	*	*	*	*	*	*	*	7
Infrastructure/construction	*	*	*	*	*	*	*	*	*	*	*	*	7
Research	*	*	*	*	*	*	*	*	*	*	*	*	5
Environment	*	*	*	*	*	*	*	*	*	*	*	*	2
	18	18	18	16	15	15	15	14	13	12	11	7	

Figure 3. Summary of key sectors designated by governments in 12 countries in 2020. *Source.* Gough and Rogers (unpublished manuscript).

feasibility of their reorganization given *existing* technologies. Hoped-for and untried (carbon-removal) technologies cannot be relied upon, especially given the collapsing windows of time necessary to avoid climate disaster (Ward et al. 2019; Larkin et al. 2018). In all, Hoffmann estimates that the jobs of around 30% of the Austrian workforce in all sectors would be vulnerable to realistic programs of climate mitigation. Some of these sectors appear in the above lists of essentials, such as crop and animal production, manufacture of food and beverages, electricity and gas supply, construction, and land transport; even health services are not unproblematic in terms of GHG emissions and fossil-fuel use.

More detail is given in the research of Hardt et al. (2021), who calculate sector differences in embodied energy intensity (not emissions) and labor intensity for Germany and the UK. The calculation of *embodied* energy intensities uses input-output analysis to estimate the impact of the entire supply chain on the final outputs of different sectors. Based on three principles, deduced from post-growth literature (increase the share of sectors with low environmental impact; increase the share of labor-intensive sectors; increase the share of sectors with low labor-productivity growth), they develop a framework for structural change that distinguishes different sector groups. While all of them must reduce their energy and emissions intensity, they have different futures under severe climate-mitigation scenarios. This also applies to the present-day essential sectors that are outlined in Figure 3. For example, while sectors such as “transport” and “manufacturing input” will need to reduce their sector share in output and employment, potentially also increasing labor productivity, sectors including essential services can increase their sector share in output and employment, while services that involve forms of relational labor must not improve their labor productivity as this tends to erode the quality of provisioning (Hardt et al. 2021). Without going into further details (see Hardt et al. 2021 for this information), this shows that there is no “one-size-fits-all” approach for establishing production floors within planetary boundaries; different goals and ways of achieving them must be acknowledged and reflected.

Transforming the essential economy further

Much more research is needed here, especially in cross tabulating the essentiality of production against embodied emissions. This would require more systematic reflections on the ability of each sector (and occupation) to contribute to the sustainable provision of basic human needs, something

that is beyond the scope of both our conceptual groundwork here and the work by Hardt et al. (2021, 3) as “it cannot be assessed based on economic statistics alone and requires democratic discussion.” Despite this clear limitation, some brief policy recommendations to synergistically link improved need satisfaction with lower environmental impact can be outlined here:

- *Transfer commodified production to public or communal ownership:* Return some essential services (e.g., housing, water, energy, platforms, Internet connection) to public ownership and/or effective control. This strengthens the floor of necessity for all (from commodity to right) and could have positive ecological implications (Coote and Percy 2020; Gough 2019; Vogel et al. 2021). It has some potential to counteract the “anarchy of production” in these sectors, where production does not primarily serve needs (use values) but profit (exchange values). The current overproduction of (financialized) housing, which increases overall housing prices (weakening the floor) and devours massive amounts of resources (transgressing the ceiling), is a case in point. Together, this provides a strong case for universal basic services (UBS)—linked to eco-social public procurement principles, public-civil partnerships, and new co-productive provisioning logics (Coote 2015)—as a key policy goal.
- *Prevent, move upstream:* There is a strong case for moving government intervention away from “downstream measures” such as compensation or cure to “upstream” regulations that prevent diswelfares in the first place (Coote and Harris 2013; Gough 2015). For example, the impact of high and rising rates of obesity imposes growing demands on health and social-care systems, yet little is being done at present to impose simple regulations on food additives or to enable active mobility more rigorously. “Upstream” prevention has the potential to improve the satisfaction of needs and cut down resource use and emissions.
- *Social licensing:* Implement “social licensing” for that part of the foundational economy currently mainly market-provided and likely to remain so, such as retail and banking. As these providers have in effect “a territorial franchise through their networks and branches,” they should, *quid pro quo*, be subjected to regulations that impose eco-social obligations (FEC 2020) that could include, for instance, limited profits,

universal access, and high labor/environmental standards.

- *Cut “guard labor” in the essential economy:* Some “guard labor,” such as certain supervisors and police, will remain essential and necessary, but much will not. Notably, the extent of guard labor across countries correlates with their degree of inequality. This suggests a “comparative capitalist methodology” to estimate surplus guard labor, comparing a nation’s performance with the “best performing” country, or the “median performance” of a group of similar, in this case advanced capitalist, countries (Doyal and Gough 1991, Chapters 12–13). For example, Jayadev and Bowles’ (2006) analysis of “supervisory guard labor” estimated the UK share as 13.4% of the labor force in 2002. Comparing this figure with the median of 7.3% for member countries of the Organization for Economic Co-operation and Development (OECD) would suggest that around 1.8 million UK workers were then unnecessary guard laborers. The total wasted labor that could be employed for the purposes of an eco-social transformation or be translated into a reduction in paid working time, which can reduce pressure on the environment and marks a decisive step toward the freedom of working people to participate in democratic decision making (Gough 2017; Devine 2021), is substantial.

Shrinking the excess economy

The upper ceiling of excess implies a zone of production that contributes neither to the satisfaction of human needs nor to sustainable flourishing (see Note 3 for the latter; Robeyns 2017). Much of it also has detrimental ecological implications. This is much less studied than the essential economy. Yet, shrinking the excess economy is key to achieving a sufficiency economy, not only because it allows for working-time reductions and frees up labor that can be employed elsewhere, but also because it eliminates a substantial share of production and associated emissions.

The dividing line between what is excess and what is not is not always clear, has changed historically and geographically, and will need to change in the future. Institutionalized democratic processes are thus crucial to discuss grey areas. However, this does not mean that no *objective* dividing lines can be drawn—objective needs are, after all, key to a theory of universal human needs. It does not, in other words, imply a “fallacy of continuum,

according to which the absence of a clear dividing line must mean the absence of any difference, as if the existence of some unclear cases meant the absence of any clear cases” (Sayer 2020, 3). Based on the debates outlined above, we discuss the following key examples of excess production: the production of luxuries (see debate on “non-/reproductive labor”), finance (see debate on “labor employed in the sphere of circulation” and the “production-boundary debate”), and military (see debate on “supervision labor” and feminist interventions into the “production-boundary debate”).⁵

Luxuries

“Engel’s Law” can provide a useful marker of luxury goods and services. Consumer expenditures that rise faster than income can be deemed luxuries, and the degree of ‘income elasticity of demand’ can measure this phenomenon (Gough 2017). Oswald, Owen, and Steinberger (2020) calculate such income elasticities of demand for broad categories of consumption in high-income countries. They find that the shares of income spent on flying, other vehicles, holidays, many forms of recreation, miscellaneous household items, and communication increase with higher incomes.

To steer a production corridor in the face of radical climate mitigation requires plotting such highly income-elastic goods against their carbon content. It is clear that such high-carbon luxuries include almost all aspects of production that underlie personal transport, not only the obviously decadent forms such as private yachts and jets, but notably also frequent flying, sport-utility vehicles (SUVs), ocean cruises, and vacations (Oswald, Owen, and Steinberger 2020). For example, between 2010 and 2018, SUVs were the second-largest contributor to global CO₂ emissions in the world, behind only the energy industry (IEA 2019). The surge in the production of SUVs has more than canceled out the improved carbon efficiency of the entire car fleet. If the 40 million SUVs in the United States were changed for ordinary cars, all 1.6 billion people in the world without electricity could have electric power without more emissions (Gough 2020b). These and other sectors of high-carbon luxury production will require radical and fast reduction. Since they are hard to decarbonize, policy recommendations include considerable taxation and the elimination of public subsidies for companies engaged in the production of high-carbon luxuries as well as banning certain products and services (e.g., ocean cruises, short-distance flights). In parallel, the production of collective and low-carbon mobility

alternatives must be facilitated (see also Oswald, Owen, and Steinberger 2020, 234).

Finance

The case for questioning much of contemporary finance from a human-need perspective has been made above. A great deal of research has exposed the sheer scale of the financial sector in the world economy (Aalbers 2015). Similarly, research has documented the harmful impact of *financialization* on the foundational economy (FEC 2018; Krisch et al. 2020) and on the welfare state (Lavinias 2017). Others have critiqued the financialization of nature (Smith 2022). We cannot elaborate on these arguments here, but they all provide insights on the role of contemporary finance in extracting value created elsewhere (Mazzucato 2018) and on its detrimental implications for satisfying human needs within planetary boundaries (Stratford 2020; Fanning, O'Neill, and Büchs 2020).

What we find lacking are robust data on the scale of such excess jobs in the broad financial sector, the skill levels of these workers, and the scope for deploying them elsewhere. One example of their extent is John Kay's (2015, 1) research on the banking sector:

[L]ending to firms and individuals engaged in the production of goods and services – which most people would imagine was the principal business of a bank – amounts to less than 10 per cent of bank assets. In Britain with a particularly active financial sector that figure is less than 3 per cent.

The role of “basic banking,” which is part of the material-foundational economy (FEC 2018), has been swamped by the deregulation of finance in the neo-liberal phase of capitalism (Shaxson 2018). The implication is that a large majority of the one million employees in the UK finance sector constitute excess labor. Moreover, the high-paying finance sector absorbs a large number of the most highly educated students, especially in mathematics and science, who could otherwise contribute their knowledge and skills to the eco-social transformation.

To shrink the financial sector, especially to instigate the “euthanasia of the rentier” (Keynes 1936), different policy options exist, for example, rigorous capital controls and financial transaction taxes. These are important pragmatic steps but will be insufficient. Under the current political economic framework conditions, finance focuses specifically on organizing the production of things that are profitable, rather than things that are necessary; financial flows, in other words, are disembodied from serving the public good. This disregards that, ultimately, all

money is public money, guaranteed by the state as the monetary sovereign (Hockett 2019). More radical options must thus be considered to reinstate democratic control over monetary provision and to mobilize sustainable production (see e.g., McCarthy 2019).

Military

The extent of the military and the emissions of the military-industrial complex across the globe are known to be vast but go unreported in all existing global accounting (Rajaeifar et al. 2022). Estimates of military-generated CO₂ emissions range between 1% and 5% of global emissions. Systematic accounts of military activities on other planetary boundaries are largely missing, but scattered evidence suggests that they are substantial (Bonneuil and Fressoz 2016). A utopian perspective would contend that all such production must be classified as excess, but that is not helpful to our analysis of the eco-social transition in the very near future. We must within this timescale assume the continuation of the world system of nation states. Can any distinction then be made between “necessary” forms of national defence and “excessive” forms? Again, we would suggest the “comparative capitalism” approach used above as a first and very rough attempt to estimate the latter. Countries with an above-average share of military expenditure and production can be identified and the labor and resources thus committed switched to civilian and need-based goals. Another priority would be to reduce the role of privatized and profit-oriented military firms (Singer 2003), where the “anarchy of production” comes with particularly perverse effects.

Some concluding qualifications

These sketchy policy recommendations sit on top of a mountain of other urgent proposals for sustainable production that we cannot review here (see e.g., Bohnenberger 2022b). To take just one example, the entire fossil-fuel industry is not considered as it provides intermediate inputs rather than final outputs that do or do not serve human needs. Of course, this does not make this industry a passive “actor”; by now, its ecologically devastating position of power has been as well documented (e.g., Franta 2022) as its deep entanglement with the production of high-carbon luxuries (e.g., Haas and Sander 2019), with finance (e.g., Ayling 2017), and the military (e.g., Bonneuil and Fressoz 2016). We “simply” assume that it must disappear fast as a fundamental plank of decarbonization for a safe climate (see Malm 2020, 138ff). Our

goal above is to suggest what extra policy recommendations are called for once we recognize the need for production ceilings as part of a sufficiency economy.

The in-between economy

We have defined the in-between economy as that part of production sandwiched between necessary and excess production. It currently employs a significant share of the paid labor force in contemporary economies, from services such as hair and beauty salons, gyms, music and artistic production, artisan manufacturing, and restaurants to a vast range of household goods including furniture, renovations, decoration, entertainment, and so forth. Within this space, the moral case to respect the role of market provision remains strong (Hodgson 2021). People's wants, and preferences for specific "want-satisfiers," will differ in a wide array that decentralized markets are better able to meet. Of course, in the case of food, clothing, housing and other need-satisfiers, the production of want-satisfiers can embrace the entire range from necessities to conventional goods to luxuries. An economy of sufficiency would aim to separate off luxury and unsustainable food, clothing, and housing while guaranteeing a right to basic levels, but leave the in-between levels to regulated market choice.

The case for regulation and intervention remains even in this domain. It rests on two pressing moral demands: to satisfy the basic needs of all people and to do so within safe planetary boundaries. The established concept of consumption corridors suggests that these two imperatives require the overruling of consumer preferences *where they conflict* with universalizable need satisfaction. Likewise, our concept of production corridors requires the overruling of producer preferences, led by the profit imperative, where they conflict with universalizable need satisfaction; this confines the "anarchy of production." For example, there will be a pressing need to reduce and control advertising extensively (Driver 2017); another to impose a right to repair and regulations to ensure long-lasting products. In face of the emerging ecological crises, the resulting consumption and production corridors will need to shrink over time, most likely at fast rates. What space that will leave for the conventional in-between economy is unknown, but it, too, will most likely need to shrink. This does not mean a reduction in pleasure, rather an opportunity for an alternative hedonism as argued by Kate Soper (2020). But in the absence of excess production, and with basic essentials provided via a robust floor, the market

can and should remain a dominant mode of provisioning in the in-between economy.

In this sense, our model has some similarities with Fraser's (2020, 293f) threefold conception of the economy under socialism, though it was arrived at separately. She summarizes it as follows: "[N]o markets at the top" (referring to the democratization of the allocation of social surplus), "no markets at the bottom" (provision of basic needs as a right),

[B]ut possibly some markets in the in-between...I imagine the in-between as a space for experimentation with a mix of different possibilities—a space where "market socialism" could find a place, along with cooperatives, commons, self-organized associations and self-managed projects.

Once, in our conception, excess has shrunk and the essential is decommodified and socialized, "the function and role of markets in the middle would be transformed. That proposition seems clear enough to me, even if I cannot say exactly how" (Fraser 2020, 294).

Conclusion

In this article, we introduced and developed the concept of "production corridors" as production floors and ceilings, complementing the growing research on "consumption corridors." We reflected on various debates that contribute 1) to theorizing floors and ceilings (human needs, planetary boundaries), 2) to making meaningful distinctions between different forms of production to inform production ceilings (Marxian categories of labor, production-boundary debate) and production floors (provisioning and the foundational economy, reproduction debate), and 3) to identifying other wasted labor resources in all production processes (unnecessary labor). The article then defined a production corridor comprising the requirements for essential production under climate-mitigation imperatives, key areas of excess production (luxury, finance, and military), and the in-between economy. Selective empirical estimates and policy recommendations have been provided throughout this discussion.

Based on the aforementioned, Figure 4 provides the briefest of summaries of the preconditions for a production corridor that *transitions* to a zero-carbon eco-social economy. It repeats Figure 2 by distinguishing the capitalist, state, and household/communal domains. It incorporates some suggestions for defining "essential" and "excess" and is rigorously focused on the zones above the ceiling and below the floor, saying less about the residual "in-between" economy.

		Commodified	Decommodified	Uncommodified
	Domain	<i>Capitalist</i>	<i>Public</i>	<i>Household/ communal</i>
Excess production	<i>Conceptualization</i>	Luxury production; extractive finance; excessive military	Excessive military; extractive finance, infiltrating the decommodified domain	
	<i>Eco-social goals</i>	Shrink	Shrink	
The ‘in-between’ production	<i>Conceptualization</i>	Remaining production for market		
	<i>Eco-social goals</i>	Decarbonize; regulate; experiment; shrink unnecessary labor		
Essential production	<i>Conceptualization</i>	Foundational Economy (commodified)	Foundational Economy (decommodified)	Core economy
	<i>Eco-social goals</i>	Transfer to public domain/submit to public goals via regulation; decarbonize; shrink unnecessary labor	Expand universal basic services; decarbonize; intervene upstream; shrink unnecessary labor	Partly shift to public to foster a universal right to care; redistribute caring responsibilities

Figure 4. The production corridor: core features.

The model described here is a *transitory model*: a transition pathway *toward* a post-growth steady-state economy. It is clear that the profit and accumulation imperatives are not only inherent to capitalism but also drivers of social-ecological crises (Pirgmaier and Steinberger 2019); thus, these imperatives need to be overcome in the long term. In the medium term, continuously strengthening the (de- and uncommodified) non-capitalist domains in our economies *and* downsizing the unregulated, excess economy fosters a greater use-value orientation. This strategy is reformist in that, in the medium term, it does not per se undermine capitalism as an institutionalized social order, which inherently depends on (strong) de- and uncommodified domains. Yet it has revolutionary potential in that it strengthens the essential non-capitalist foundations for further struggles against the reified power of capital (for more details see Bärnthaler 2023a). While it is certainly true that corridors are at odds with capitalism (Pirgmaier 2020), such arguments tend to mislead, because it is *the continued struggle* to implement production corridors that constitutes a critical struggle against capitalism.

In this context, it is also important to recognize and harness critical conjunctures. During the pandemic, essential economic zones were prioritized; with the war in the Ukraine, many countries developed plans to determine which industries would have to endure cuts in energy supply if gas becomes short; and in Italy and Spain, corridors on water usage have been implemented during the droughts

in 2022 and 2023. This is not to deny that some of these policies have been short-lived and that powerful forces seek to continue “business-as-usual” at all costs. But assuming that social-ecological and geopolitical crisis dynamics will continue to accelerate, sharpening and developing corridor concepts is a crucial endeavor. “Only a crisis produces real change,” Milton Friedman (1962, 32) wrote, and “when that crisis occurs, the actions that are taken depend on the ideas that are lying around.” When disasters strike, concepts currently perceived as visionary might be operationalized *despite* powerful capital fractions—if not out of conviction, then out of necessity.

Notes

1. See <https://www.tandfonline.com/journals/tsus20/collections/consumption-corridors>.
2. We acknowledge that ecological science recognizes at least nine planetary boundaries. However, to make this article manageable, we concentrate solely on climate change and global warming. Hence, the use of the term “decarbonize”—which is itself a shorthand for the atmospheric removal of all greenhouse gases including methane and nitrous oxide.
3. Flourishing refers to an expanded conception of life that goes beyond meeting basic needs. People will wish to pursue myriad different goals, any of which will require further consumption and production choices. The ceiling then discriminates between those choices that are achievable within planetary limits and those that are not. See the forthcoming special issue on “Sufficiency, Sufficiencyarianism and

Limits in the Context of Ecological Crisis,” in *Ethics, Policy and Environment*, including Gough.

4. We use the term “domain” in a threefold manner: when referring to 1) the domains of “consumption” and “production,” 2) the “essential,” “in-between,” and “excess” domains, and 3) the “capitalist,” “public,” and “household/communal” domains. Furthermore, “zones” exist within these domains, for example, a foundational zone and a zone of luxury production. Finally, within these zones, there are “sectors.”
5. Discussing these areas as key entry points for shrinking substantiates the above-discussed requirement to rethink what is considered “essential” (and to what extent) as, in most countries, both finance and defense can almost entirely be classified as such (see Figure 3).

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