



## Analysis

## How to pay for saving the world: Modern Monetary Theory for a degrowth transition

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## ABSTRACT

Degrowth lacks a theory of how the state can finance ambitious social-ecological policies and public provisioning systems while maintaining macroeconomic stability during a reduction of economic activity. Addressing this question, we present a synthesis of degrowth scholarship and Modern Monetary Theory (MMT) rooted in their shared understanding of money as a public good and their common opposition to artificial scarcity. We present two arguments. First, we draw on MMT to argue that states with sufficient monetary sovereignty face no obstacle to funding the policies necessary for a just and sustainable degrowth transition. Increased public spending neither requires nor implies GDP growth. Second, we draw on degrowth research to bring MMT in line with ecological reality. MMT posits that fiscal spending is limited only by inflation, and thus the productive capacity of the economy. We argue that efforts to deal with this constraint must also pay attention to social and ecological limits. Based on this synthesis we propose a set of monetary and fiscal policies suitable for a stable degrowth transition, including a stronger regulation of private finance, tax reforms, price controls, public provisioning systems and an emancipatory job guarantee. This approach can support broad democratic mobilization for a degrowth transition.

## 1. Introduction

In the face of various accelerating social and ecological crises, our political imagination remains constrained by two myths, closely related to one another: (1) the notion that perpetual growth is a necessary feature of a functioning economy, and (2) the notion that democratic governments are financially constrained in the pursuit of social and ecological objectives. The myth of financial constraint means that governments believe their only option for funding social and ecological objectives is to first pursue growth. This is a problem, because growth makes it much more difficult to reduce emissions (IPCC, 2022, ch. 4 p. 27; see also ch. 5 p. 3). Under these assumptions, survival of life on Earth can only be imagined as a precarious bet on some unprecedented technological change taking place within capitalism, the feasibility of which is not supported by existing empirical literature (Hickel et al., 2021a).

Degrowth scholarship debunks the myth that continued economic

growth in high-income nations is necessary for improving social outcomes, and outlines how such improvements can be achieved with less aggregate production and less resource and energy use. A core principle of degrowth is that expanding universal public services, shortening the working week, introducing a public job guarantee, and reducing inequality would de-link human well-being from growth and make it possible to scale down less-necessary forms of production without negative social consequences.

Degrowth is focused on high-income countries, which are overwhelmingly responsible for excess resource use and emissions (Fanning et al., 2022), where productive capacity is well in excess of what is required to meet human needs (Millward-Hopkins et al., 2020). In this context, degrowth is a more plausible alternative to the failed paradigm of "green growth" (Haberl et al., 2020; Hickel and Kallis, 2020), and a necessary component of any viable climate mitigation pathway (Creutzig et al., 2018; Hickel et al., 2021a).

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Degrowth literature increasingly acknowledges the key role of the state in this transition (e.g. Koch, 2019, 2022; Parrique, 2019; Schmelzer et al., 2022). However, critics often claim that degrowth is not compatible with ‘sustainable’ public finances (e.g. Pasche, 2018). Indeed, several practical questions have not yet been addressed: What is an adequate approach to fiscal and monetary policy in a degrowth transition? How can macroeconomic stability be ensured during an equitable reduction of both aggregate supply and demand? How can universal public services, renewable energy deployment, and ecosystem restoration measures be paid for in such a scenario? How might the monetary system be governed to facilitate a radical social-ecological transition out of capitalism?

In this article, we draw from Modern Monetary Theory (MMT) to address these questions. MMT analyses the actual setup of modern monetary systems to show how states that issue their own currency are not constrained by a financial budget or by their tax revenue. Even a large public deficit in relation to GDP does not, in and of itself, create macroeconomic problems. MMT thus clarifies how governments can fund social and ecological projects without the need for aggregate growth. However, conventional accounts of MMT have tended to focus on how monetary and fiscal policy can be leveraged in pursuit of full employment and price stability by maximizing productive capacity. Here we argue that such productivism is unnecessary, and that MMT can be understood as a valuable tool for a degrowth transition.

### 1.1. Research gap

The relationship between MMT and degrowth has scarcely been discussed in the academic literature (the exceptions being Hickel, 2020; Mastini et al., 2021; briefly Jackson and Victor, 2019, p.26 and Schmelzer et al., 2022, p.222; and, discussing the job guarantee, Alcott, 2013 and Unti, 2018). Generally, the two movements seem to be advancing in different social milieus and institutional territories, using different political strategies.

Most ecological economists do not offer adequate analyses of the contemporary monetary and financial system (Ament, 2020; see also Section 3).<sup>1</sup> This problem is also reflected in the modelling literature. The neoclassical Integrated Assessment Models (IAMs) used in climate policy modelling normally do not include money or finance at all (Espagne, 2018). Where IAMs do include a government sector, they typically suggest that public deficits will grow at least temporarily during a low-carbon transition, and that this is problematic because it will reduce welfare by crowding out private activity and increasing the cost of issuing further debt (e.g. Semmler et al., 2018). Relying on orthodox IAMs, the IPCC does not deviate from the mainstream view of public finance (e.g. IPCC, 2022, ch. 15, pp. 48, 63) and does not yet include scenarios for a degrowth transition.

Ecological economists modelling low-carbon transition scenarios also tend to worry, for instance, that “carbon tax revenues are not enough to pay for public expenditure [and] public debt accumulates. The interest rate on debt increases.” (Campiglio et al., 2015). Others who model no-growth and degrowth scenarios also problematize the increase of public debt to GDP (e.g. Berg et al., 2015; Fontana and Sawyer, 2016; Godin, 2012; Semieniuk et al., 2021). For instance, the authors of the EUROGREEN model suggest that the “detrimental effect on public deficit in the long term [...] is a cost our societies may need to

<sup>1</sup> Some of the work in ecological macroeconomics (for overviews see Rezaei and Stagl, 2016 or Hardt and O’Neill, 2017) integrates theories of endogenous money, including MMT (Hail, 2018; Lawn, 2010). However, these approaches often fail to adequately recognize some of the limits to technological innovation, the pervasiveness of various ecological crises beyond climate change, and the (geo-)political conflicts that constrain transition pathways (Svartzman et al., 2019). While Hail (2018) offers a deeper integration, the policy implications are focused on the role of a job guarantee.

pay in order to avoid social unrest” (d’Alessandro et al., 2020; p. 1). The notion that high public deficits constitute a cost is almost universally accepted without further justification.

We make two theoretical contributions: First, we seek to clarify some misconceptions related to monetary theory prevalent in the degrowth literature. Concerns about public deficits are unwarranted, as there is no necessary social or economic cost associated with a high public deficit in a degrowing economy. Second, we suggest integrating insights from degrowth scholarship into MMT, which has not yet grappled with the reality of social and ecological limits to production. Against this backdrop, we outline an MMT-informed monetary and fiscal policy program for a radical degrowth transition. We address issues related to demand management, price stability and regulating private finance. We discuss the job guarantee as a key policy, before concluding with some remarks on political strategy and further research opportunities.

## 2. A tale of two scarcities

MMT and degrowth are strong intellectual and strategic complements. Not only have both gained much ground in recent years, they also share many ideas, including a strong opposition to neoliberal austerity and, more generally, to artificial scarcity.

### 2.1. Degrowth: against the artificial scarcity of essential goods

Degrowth scholarship notes that capitalist growth depends on the creation of artificial scarcity. Human needs can typically be satisfied either by means of relatively resource-efficient, non-commodified need satisfiers (for instance, public transit; food from a community kitchen), or by means of relatively scarce and resource-inefficient commodities (a privately owned car; a meal from a home-delivery service). Under capitalism, essential goods (housing, healthcare, transit, nutritious food, etc.) are commodified and access is mediated by prices that are often very high. To obtain the necessary income people are compelled to enter the capitalist labour market, working to produce things that may *not* be needed simply to access things that clearly *are* needed. Artificial scarcity of essential goods thus ensures a steady flow of labour for capitalist growth. It also creates growth *dependencies*: if productivity improvements (or recessions) lead to unemployment, people suffer loss of access to essential goods and growth is needed to create new jobs and resolve the social crisis. This dynamic explains why, despite capitalism’s high levels of production and resource use, many basic needs remain unmet even in high-income countries. In this respect, capitalism is deeply inefficient and wasteful.

A degrowth framework embraces *efficiency* improvements while calling also for *sufficiency* – rejecting the assumption of unlimited desires and emphasizing the importance of meeting finite and satiable needs (Gough, 2019; Max-Neef et al., 1991). Degrowth scholarship calls for the creation of democratic universal public services to permanently end the artificial scarcity of key need-satisfiers and support ‘radical abundance’ (Coote and Percy, 2020; Hickel, 2019; Millward-Hopkins et al., 2020), along with a public job guarantee to eliminate involuntary unemployment and mobilize labour to achieve socially and ecologically necessary objectives. This approach ensures secure access to livelihoods and essential goods regardless of fluctuations in aggregate output, thus de-linking human well-being from growth, and making it possible to scale down destructive and less-necessary forms of production in a just and stable way.

### 2.2. MMT: against the artificial scarcity of money

Under neoliberal capitalism, the continuous enclosure and commodification of social provisioning systems has been extended to the institution of money. The state has the capacity to create money and govern the monetary system to mobilize production for democratically ratified social objectives. Yet this power has been largely allocated to

commercial banks, with investment dominated by large financial firms and asset managers, while ostensibly independent central banks work to stabilize private financial markets and ensure a smooth process of capital accumulation (Braun and Gabor, 2020).

This arrangement of the monetary system obscures the socio-political nature of money, consistent with the neoliberal project of “disenchant[ing] politics by replacing it with economics” (Davies, 2016). In reality, money and debt relations are social processes that are embedded within, and reinforce, existing hierarchies and power structures (Graeber, 2011; Ingham, 2002). The monetary system is politically and legally constructed, it has operated differently in the past and will operate differently in the future.

Any debt instrument functions as money only if it is convertible at par into the liabilities of the state (Bell, 2001; Pozsar, 2014). Because central banks are the only actors in the monetary system that are not subject to liquidity constraints, all other issuers of credit must rely on central bank backstops if their liabilities are to be recognized as money. The state thus remains the guarantor of the validity of money and the functioning of the monetary system, and therefore ultimately determines what counts as money (Schneider and Miess, 2023).

As a result, a state with monetary sovereignty can always ensure that its liabilities are acceptable as money. It can therefore afford to pay for anything that workers, resources, and technology available in the national economy can actually do. This insight, famously outlined by Keynes in his book “How to Pay for the War” (Keynes, 2010 [1940]), is the key tenet of Modern Monetary Theory (e.g. Hail, 2022; Kelton, 2020; Mitchell et al., 2016; Wray, 2015).

The state creates money when it spends. Private agents are motivated to use the money denominated in the unit of account determined by the state due to the legal and institutional framework enforced by the state, including the payments system, fees, fines, and taxation. When firms and households pay taxes, the state’s account is credited again, which effectively destroys the money that had been initially spent into existence. This circuit is an idealized description, and the concrete process depends on the institutional framework of the monetary jurisdiction in question. However, in general a state that issues its own non-convertible currency and has no foreign-denominated debt never faces a *financial* (or monetary supply-side) constraint to its expenditure. There is only a *real* (monetary demand-side) constraint to public spending, and that is the productive capacity of the economy (including social and ecological limits to production).

The hegemony of neoliberal ideology has led most people to wrongly presume that governments fund their expenditure by *first* taxing their citizens, as well as by issuing debt that must eventually be ‘repaid’. Given the hegemony of this notion, governments can easily cite the need to ‘balance the budget’ when they prioritize economic growth over social and ecological objectives, or when they choose to cut funding for public services. The austerity politics made possible by the widespread acceptance of this notion have further intensified the artificial scarcity of essential goods.

### 3. Modernizing degrowth’s monetary theory

Degrowth scholars have in the past proposed to transform money through two sets of policies. Some envision an ‘ecosystem’ of special-purpose monies whose purchasing power is constrained to specific economic spheres, to foster locally embedded modes of production and reproduction (e.g. Fitzpatrick et al., 2022; Kallis et al., 2012; Parrique, 2019:640). Special-purpose monies can complement our approach of reforming national monetary systems (see Section 5.3), but as any money, they require state backing and finely calibrated monetary policies to be effective (Olk, 2023). Others have proposed a regime of “sovereign money” (e.g. Dyson et al., 2016; Farley et al., 2013; for an overview, see Parrique, 2019, p. 651), also called “positive money” (e.g. van Lerven, 2016), or “full reserve banking” (e.g. Fisher, 1935; Henke, 2017; for an overview, see Lainà, 2015), where money creation is a

purely fiscal capacity. Rather than commercial bank loans creating new money ‘out of thin air’, all commercial bank liabilities would be backed 1:1 by central bank reserves.

The ‘monetary growth imperative’ is the key concern driving these proposals. In reality, growth imperatives are not intrinsic properties of money or interest per se, but depend on social relations of capitalism that drive accumulation (Cahen-Fourot and Lavoie, 2016; Richters and Siemoneit, 2017; Svartzman et al., 2020). Calls for sovereign money are rooted in a monetarist logic and do not alleviate existing issues around state financing nor financial stability (Cahen-Fourot and Lavoie, 2016; Fontana and Sawyer, 2016; Røpke, 2017). Further, eliminating all commercial bank money creation would entail a significant concentration of power at the central bank (Pettifor, 2020). Radical reform of the commercial banking system – toward a decentralized, non-profit institutional structure for local administration of funds – is needed.

Degrowth needs a monetary and fiscal policy program that can account for the key role of large-scale government spending in any fast and effective social-ecological transition. Many ecological economists suppose that such a transition must rely on private capital (e.g. Baer et al., 2021; Campiglio et al., 2015; Solé et al., 2018). Given the dismal record of private finance to achieve even a modest shift away from fossil fuels (Dafermos et al., 2021; IEA, 2021), this would be concerning if it were true. In reality, the state can and must undertake many of the investments necessary to mitigate climate change, including in renewable energy capacity, ecosystem preservation and restoral, and carbon removal, because these activities may not yield profits that would attract private capital (Buck, 2019; Christophers, 2021; interestingly also McKinsey, 2021). Parts of the energy sector may also have to be nationalized to ensure a rapid transition away from fossil fuels without significant disruption to essential energy provisions (Hickel, 2021b; Malm, 2020). Importantly, MMT confirms that the state’s capacity to fund any of these measures is not constrained by the level of private investment nor of GDP.

#### 3.1. The fiscal growth imperative is a political choice

The question of public finance is often among the first points raised by skeptics of a degrowth transition (e.g. Pollin, 2019; see Parrique, 2021 for an overview of such skepticism). In the short term, many commentators fear that public spending on social-ecological policies would divert funds from other purposes and exacerbate public debt levels. In the long term, if degrowth leads to less GDP, this would shrink the tax base and supposedly aggravate the problem of public debt. Pasche (2018, p.3) has formalized this orthodox view of a “goal conflict between degrowth and sustainable [sic] public finance”. He assumes that the state must tax its citizens and borrow from banks and investors who require higher yields from governments with large debt/GDP ratios. States with declining GDP will then devote an ever-higher proportion of their budget to interest payments. They will have to borrow more and more just to fund even a constant level of expenditure – a debt spiral ensues.

This concern has not yet been convincingly addressed. For example, degrowth scholars talk of “financing” basic income and services through taxation (e.g. Andersson, 2010; Kallis et al., 2012; Victor, 2008), and assume that welfare states “redistribute taxes” (Koch, 2022, p.4), or that taxes are “the main source of states’ revenues” (Richters, 2019). As a result, they worry that states, like private debtors or municipal governments, must generate revenue in order to pay interest on their debt (see Hickel, 2020). Degrowth scholarship has thus uncritically reproduced the myth of the “growth-dependent welfare state” (e.g. Koch, 2021, p.1). Some scholars have even supported constitutional limits on government deficits, based on the orthodox assumption that economic growth will at some point be required to “pay for” public debt (Seidl and Zahrnt, 2010). The question of public finance is the Achilles heel of degrowth.

MMT demonstrates that these concerns are unfounded, as the artificial scarcity of money and the resulting growth dependence are political choices, not economic necessities. While accumulating *private* debt can become ‘unpayable’ in the absence of economic growth (Hartley and Kallis, 2021), *public* debt – understood here as the liabilities of the nation state – if denominated in the sovereign’s unit of account, can never become ‘unpayable’. Moreover, even a very large debt-to-GDP ratio does not have to be problematic, as the case of Japan demonstrates (Wray and Nersisyan, 2021). An expansion of government spending on social and ecological objectives, then, does not require growth to be financially sustainable (confirming Mastini et al., 2021).

Of course, governments are constrained if an arbitrary legal limit applies to their debt-to-GDP ratio. The members of the Eurozone have imposed such a limit upon themselves and also upon the neocolonial CFA Franc zone (Pigeaud and Sylla, 2018). Additionally, municipalities are constrained if legally required to fund themselves by selling bonds to private investors. All of these constraints are political artefacts which can be abolished. The real limits to fiscal spending are price stability, reflected through inflationary pressures (as MMT points out), and the state of the biosphere (as degrowth contributes).

### 3.2. Controlling inflation

Not unlike central bankers (Tarullo, 2017), degrowth scholarship lacks a coherent theory of inflation. MMT offers just such a theory.

Inflation represents social conflict over the distribution of goods and resources, mediated by the price system. Distributional conflicts typically take the form of inflation when aggregate supply does not keep up with growing demand. But prices are also shaped by institutions and power (Bernal, 2021). When producer oligopolies or a workforce with collective bargaining power seek to protect or increase their share of aggregate income through raising prices or wages, this can lead to inflation (Mitchell et al., 2016; Wilson, 2021; Wray, 2015). For instance, as the Covid experience shows, inflation may be driven by supply-chain bottlenecks, or by producers using a transitory increase in input prices to substantially increase their profit margins (Bernal, 2021; Weber and Wasner, 2023).

One challenge for a degrowth transition is that an increase in public expenditure implies, *ceteris paribus*, an expansion of aggregate demand. An increase in aggregate demand that drives an expansion of aggregate supply amounts to economic growth. However, if the expansion in demand occurs under conditions of inadequate supply due to limitations imposed on productive capacity, inflation may ensue.

To control inflation, some MMT economists favor an expansion of productive capacity in sectors facing supply bottlenecks through targeted industrial policy (e.g. Nersisyan and Wray, 2022). Similarly, prominent Keynesian ‘Green New Deal’ proposals suppose that growth of aggregate supply is required to match the initial increase in aggregate demand in order to prevent inflation (e.g. Pettifor, 2020). However, for high-income countries, where resource and energy use exceed sustainable levels, this is not an ecologically viable approach. As degrowth scholarship points out, high-income countries need to *reduce* aggregate production to bring resource use back to sustainable levels. This can be achieved by lengthening product lifespans, and by reducing production as well as productive capacity in ecologically destructive and socially less-necessary industries (SUVs, private jets, fast fashion, beef, arms, etc.). In a degrowth scenario, an increase in socially and ecologically necessary production is reconciled with ecological limits by reducing less-necessary forms of production.

In order for a degrowth transition to be conducted in a manner that does not induce inflation, the demand for energy and raw materials must be reduced at least as fast as their supply. This means actively reducing the purchasing power of high-income households, whose consumption is disproportionately responsible for the ecological and climate crises, and reducing effective demand in any sectors that do not contribute to social and ecological goals. Both approaches can neutralize the expansionary

effects of increased public spending and the inflationary pressure resulting from the simultaneous reduction in productive capacity.<sup>2</sup>

## 4. Degrowing Modern Monetary Theory

MMT economists are often careful to stress that the ‘T’ stands for ‘theory’, not for ‘transformative policy platform’. Arguably, like any economic theory, MMT is both. In both its descriptive and its prescriptive capacities, it features increasingly prominently in contemporary left-wing discourse, while its descriptive aspects are now accepted by some parts of the financial and political establishment (Mackintosh, 2021).

The prescriptive element is clear in near-universal calls by MMT economists for a job guarantee, discussed in detail in Section 5.4. Other policies commonly associated with MMT are floating exchange rates, central banks proactively (rather than reactively) setting interest rates, and a low or zero fixed overnight rate (e.g. Hail, 2022; Tcherneva, 2012; Wray, 2015). Most MMT economists also support progressive taxes on wealth and income, a Green New Deal and an extension of public services (e.g. Hail, 2022; Nersisyan and Wray, 2021), as well as fundamental reforms to the international monetary system (e.g. Tymoigne, 2020; Kaboub, 2021). MMT and degrowth thus share a remarkable overlap in their policy proposals, which we focus on in Section 4.

Obviously, the insights of MMT can be used not only for progressive purposes, but also to pursue regressive forms of production, or war. Indeed, aggressive state-spending has marked some anti-democratic and imperialist regimes historically (Merchant, 2021; Tooze, 2006, 2022; consider also Knapp, 1909, 1918). That is precisely why it is important to integrate the explicitly anti-imperialist, decolonial and radical-democratic perspectives of degrowth into the MMT discourse.

### 4.1. Critiques of MMT

Two existing critiques of MMT are particularly relevant from the perspective of degrowth.<sup>3</sup> First, as Marxists and Kaleckians point out, while any government may be technically able to ensure full employment, the reproduction of capitalist social relations requires a ‘reserve army’ of unemployed that disciplines workers. Full employment would undermine this core tenet of capital accumulation (Lapavistas and Aguila, 2020; Merchant, 2021). Capitalist states therefore employ deflationary policies that maintain a certain level of unemployment (Feygin, 2021). MMT economists have argued that this critique applies to ‘aggregate pump-priming’, whereas the job guarantee program proposed by MMT avoids this issue by setting a floor on the cost of labor, rather than actively bidding for labor (Mitchell and Watts, 2003). In our view, the demand for full employment should be seen as a strategic tool for escalating political struggles which, as Marxists would agree, is the key to eventually transcending capitalism.

The second critique relates to the hierarchical structure of the global monetary and economic system. While countries in the ‘periphery’ of the world system (Wallerstein, 1979) face a strict balance-of-payments constraint and are dependent on resource exports to fund imports of technology and capital goods, ‘core’ countries that issue or have privileged access to internationally acceptable currency may use their

<sup>2</sup> Even proposals for funding a Green New Deal without growth (Mastini et al., 2021) can be reconsidered through this lens. For instance, shifting public expenditure away from fossil fuel subsidies and military spending is obviously reasonable, but strictly speaking, its effect is not to “free up room in the government’s budget”, but instead to reduce effective demand in sectors that should degrow, and therefore to create macroeconomic and ecological space for increased public spending in useful sectors.

<sup>3</sup> A third, common but less relevant critique regards MMT’s analytical consolidation of the treasury’s and central bank’s balance sheets (e.g. Lavoie, 2013; Sawyer, 2019; for a reply, see Wray, 2015).

monetary privilege to mobilize not only domestic, but also foreign resources (Bonizzi et al., 2019; de Paula et al., 2017; Svartzman and Althouse, 2020). MMT scholars (Kaboub, 2006, 2008; Kaboub et al., 2015; Koddensbrock and Sylla, 2020; Vernengo and Pérez Caldentey, 2020) have addressed these challenges in some detail. They recommend interest rate targeting by peripheral central banks, floating exchange rates, and industrial policy for food and energy sovereignty, alongside calling for de-colonial reparations and the abolition of illegitimate debts (Kaboub, 2020) to increase monetary sovereignty, and hence the applicability of the policies outlined in this article (see also Section 6.1). Still, our own analysis focuses on high-income core economies with relatively high degrees of monetary sovereignty.

#### 4.2. Integrating ecological constraints into MMT

To the above points, a social-ecological critique must be added. MMT has an ambivalent relationship to the ideology of economic growth. Many MMT economists are explicitly agnostic about GDP growth, recognizing its irrelevance to the goal of achieving full employment and price stability (e.g. Kelton, 2020, p. 154 ff; Wray, 2019, ch. 2). Some are critical of GDP as a measure of social and economic progress (e.g. Ehnts, 2022; Wray, 2015), and echo the degrowth critique that most GDP growth accrues only to the top percentiles of the income distribution (Kelton, 2020, p. 378; Tcherneva, 2017). At the same time, key MMT scholars posit “restoring GDP growth” (Dantas and Wray, 2022, p. 317), “stable, long-term growth” (Wray, 2019, ch.7) or “moderate growth of living standards” (Tymoigne and Wray, 2013) as explicit goals.

MMT clearly does not yet account for any constraints to production resulting from planetary boundaries or social limits to growth.<sup>4</sup> From the perspective of ecological economics, production requires resources and energy, and are bound by biophysical limits (Georgescu-Roegen, 1971). So far there is no evidence of sufficient absolute ‘decoupling’ between GDP and environmental pressure (D’Alessandro et al., 2020; Hickel and Kallis, 2020). Importantly, safe ecological limits may be reached long before full employment of labor is achieved – in fact, all high-income nations already transgress them (Fanning et al., 2022). This is not readily apparent only because the impact of excess economic activity is being shifted onto the global periphery, onto disempowered groups (e.g. through unpaid care work), and into the future. The very idea of degrowth is to bring an end to this unjust and unsustainable displacement of the burden created by excess economic activity by decreasing both effective demand and productive capacity in socially less necessary sectors, including in the fossil fuel, industrial agriculture, and private transport sectors that are particularly relevant to price stability (Weber et al., 2022). Public spending should be planned so as to decrease effective demand in those sectors. For instance, a fast public roll-out of renewable energy and energy-efficient provisioning systems should be combined with measures to reduce purchasing power by wealthy households and demand for unsustainable production (Olk and Söding, 2022). In addition, macroeconomic models used to calculate the space for non-inflationary spending should account for feedback loops from ecological crises on productive capacity, which are already driving inflationary pressures in the key sectors of agriculture, energy and transport (Olk et al., 2023) as well as threatening financial stability (Bolton et al., 2020).

In fact, fiscal and monetary policy choices have historically been determined to a significant degree by fossil fuel prices (Thompson, 2022). However, the standard response to rising energy prices is predicated on depriving lower-income households of energy services through

contractionary fiscal and monetary policy, alongside increased energy production, including from fossil sources. In contrast, fiscal and monetary policy for a just and stable degrowth transition will need to prioritize an equitable reduction of demand for energy and other resource-intensive commodities, alongside (and by way of) the construction of publicly funded sustainable provisioning systems that can fulfill everyone’s needs with minimal energy and resource use. Achieving this dual movement through targeted macro-economic management is the key to an MMT-informed degrowth transition.

#### 5. Monetary and fiscal policies for a degrowth transition

The policies proposed by MMT and degrowth share a significant overlap. Some are intended to serve different goals in the two sets of literature, but these goals are highly complementary. For instance, reducing energy demand may not only decrease carbon emissions, but also ease inflationary pressures. Fig. 1 illustrates this overlap.

Both MMT and degrowth deviate from mainstream approaches by proposing targeted measures to manage sector-specific effective demand in line with the availability of resources. Currently, the management of employment levels and aggregate demand falls largely upon central banks, who work through financial markets and rely on blunt tools (primarily interest rates and asset purchases/sales) to address these issues, with socially suboptimal effects, both at a domestic and international level (Bernal, 2021). Fiscal policy has the capacity to operate in a more finely-tuned and equitable manner – to stabilize prices, directly ensure employment, promote sustainable sectors, support regions ‘left behind’, abolish extreme wealth, and directly benefit marginalized communities.

##### 5.1. Shifting taxation from labor to wealth and resources

From the perspective of MMT, taxes amount to the ‘destruction’ of money, and thus a reduction and redistribution of effective demand. Their function is not to create revenue for the government, but to create macroeconomic (and ecological) space for public spending and to reshape income and wealth distribution. MMT demonstrates that the necessary reduction of demand through taxation does not necessarily have to precede the construction of sustainable provisioning systems. This is a strategic advantage, as citizens may oppose higher taxes precisely because they fear losing access to commodified need satisfiers.

The degrowth literature, in turn, does not discuss the macroeconomic effects of taxes as much as their distributional and ecological effects. This scholarship favors shifting taxation from wages to wealth, financial transactions, inheritances, and ecologically destructive consumption goods (Kallis et al., 2012; Parrique, 2019, p. 36). The moral principle of sufficiency, in and of itself, requires taxes on high incomes and high wealth (Parrique, 2019, p. 235 ff.). These taxes would effectively reduce emissions, as the wealthiest individuals are responsible for a disproportionate share of global emissions in excess of planetary boundaries (Gore et al., 2021; Otto et al., 2019). Shifting taxation away from labor and toward the consumption of resources and energy is also an effective tool to steer demand away from the ecologically most destructive sectors that are also particularly prone to inflationary pressure (Weber et al., 2022). Consumption of specific goods can be further reduced through absolute caps or bans on advertising (Cosme et al., 2017).

The tax schemes proposed by MMT and degrowth are complementary, but there may be tradeoffs. For instance, while high tax rates on top income earners reduce inequality, they are relatively ineffective for reducing inflation, since the rich save proportionally more of their income. The synergies and political tradeoffs between the objectives of reducing inequality, inflation, and environmental impacts warrant further research.

<sup>4</sup> For instance, the only expansive study of a ‘Green New Deal’ within an MMT framework (Nersisyan and Wray, 2021) focuses exclusively on the issue of de-carbonization, to the neglect of other ecological crises, and discusses the mobilization of resources purely under the constraint of inflation, not biophysical limits to resource throughput.

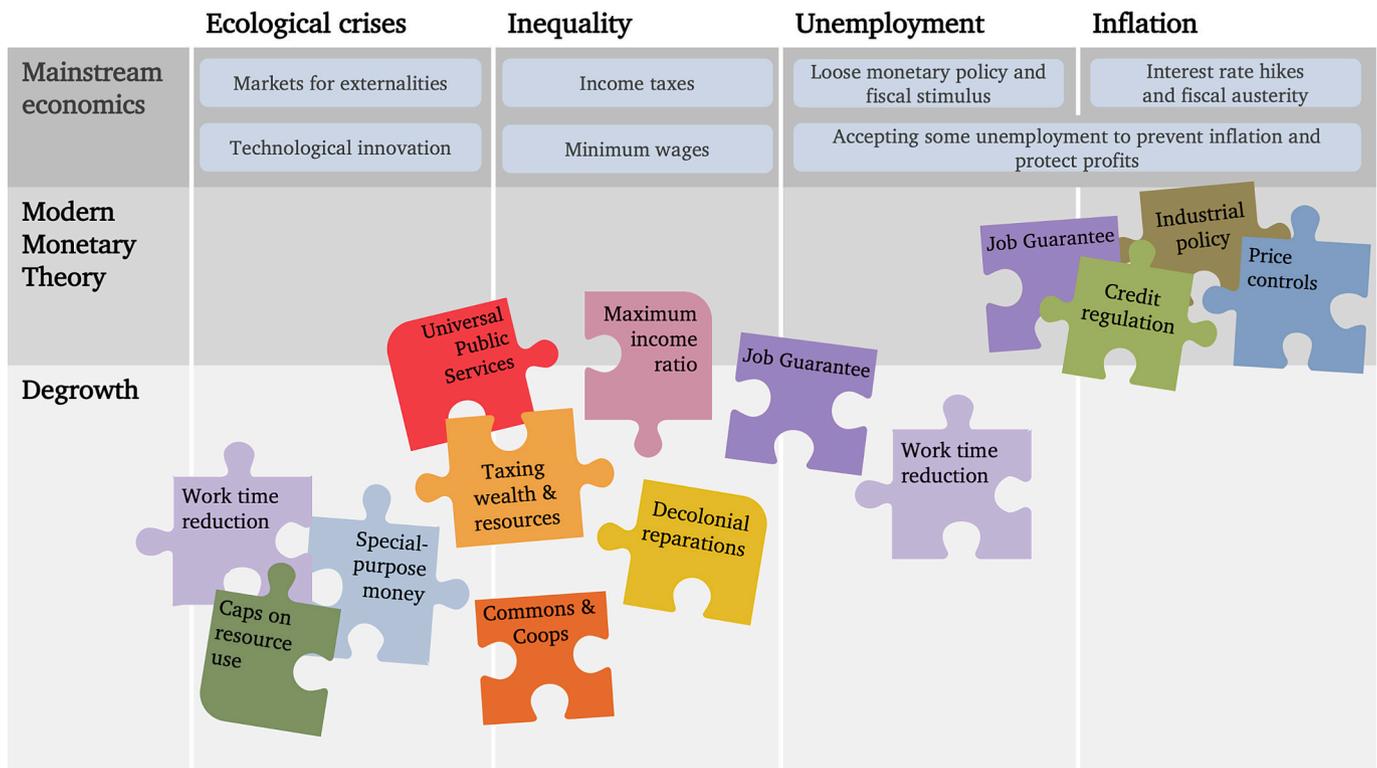


Fig. 1. Degrowth and MMT policies.

## 5.2. Credit regulations: degrowing private finance

Understanding money as a public good, created through and backstopped by the authority of the government, has implications for the broader system of credit creation. The creation of money has been franchised (to banks) and increasingly sub-franchised (to non-bank financial institutions; see Pozsar, 2014) by currency-issuing governments (Hockett, 2019). The corresponding extension of liquidity fuels the growth of market-based finance and financial accumulation (Muthaq, 2021). Credit is preferentially allocated to the fossil fuel sector due to its perceived and historic profitability (Christophers, 2021). Instead, a targeted and democratically governed approach to credit regulation would serve as a compliment to public investment to both direct private finance in line with a degrowth transition, and to alleviate inflationary pressures that emerge from a planned reduction of production.

Central banks have tools to support such an approach (Tankus, 2022). Before the hegemonic shift to a model of (in theory) independent and apolitical central banking, central banks through the mid 20th century had operated under explicit direction of the government to direct investment toward social purpose, using a much broader range of tools than are employed today (Elliott et al., 2013; Gabor, 2021; Levey, 2020; van't Klooster, 2021).

Direct *qualitative* credit regulation can focus on *sectors* (such as strict limits on credit allocation for the fossil fuel sector) or on *activities* (such as limiting credit for mergers and acquisitions). Disincentivizing the bad alongside incentivizing the good is a powerful tool to regulate economic demand in the face of potential inflationary pressures. Direct *quantitative* credit regulation is effectively a credit ceiling on bank money creation, which - as a compliment to qualitative regulation, and a job guarantee program (outlined in Section 5.4) - can serve to ensure a level of demand consistent with price stability (Monnet, 2019). The commercial banking sector and endogenous money creation are not antithetical to a degrowth transition if embedded within such a structure. Beyond banks, to effectively degrow and limit the power of finance, it is critical that

credit regulation be extended to the non-bank financial sector (i.e. shadow banking).

The approach outlined here replaces the very blunt tool of interest rates with a much deeper and more effective toolbox. MMT economists propose maintaining a zero rate of interest for countries with a floating exchange rate (Forstater and Mosler, 2005; Fullwiler, 2020), as high interest rates on government bonds drive wealth inequality and potentially generate inflationary pressure. A zero rate on government bonds and overnight bank lending can be complimented by differentiated interest rates for lending on other assets and loans, in line with credit regulation as outlined above.

This approach requires coordination between fiscal and monetary authorities. Although the operations of the treasury are never constrained by central banks, and even 'independent' central banks effectively support government spending, primarily through either direct or "tacit" monetary financing (Gabor, 2021; see also Felipe and Fullwiler, 2021), a higher degree of coordination between the two institutions helps control interest rates and ensure financial stability (Tymoigne, 2014).

In addition to credit-creating institutions, institutional cash pools (such as insurance and pension funds) play a central role in the growth of the financial system. The modern financial landscape is one of highly concentrated money manager capitalism (Braun, 2020; Steele, 2020), buoyed by inflated aggregate asset prices which central banks have obligingly ensured through expansive quantitative easing programs. Placing qualitative and quantitative restrictions on both central bank purchases and the asset holdings of these funds would limit the power of the largest financial actors. Going beyond regulation, de-financializing cash pools is necessary to 'degrow' finance. In the case of pensions funds, this would include a shift (back) to pay-as-you-go schemes, supported by the development of in-kind public provisioning systems for elderly care (Aigner et al., 2022). More concrete work on policies to support planned financial degrowth is needed, as these are critical to maintain financial stability.

### 5.3. Price controls, complementary currencies, and universal public services

Three further policy tools to reduce aggregate demand and inflation are closely related. The first are price controls, a tool that is being discussed again in the context of inflationary pressures that emerged during the Covid-19 pandemic (Weber, 2021). Well-designed price controls can amount to a soft form of equitable rationing, consistent with degrowth's ideal of sufficiency. For instance, in the context of the 2022 energy crisis, Dullien and Weber (2022) proposed to fix the price of a certain quantity of gas per household, thereby ensuring more equitable access to basic heating services, and allowing markets to determine the price of any quantity of gas consumed beyond that threshold.

While price controls and direct rationing both ensure that excess demand does not result in inflation, they potentially leave households with excess income. In economies with high levels of private debt, a certain share of such excess income may be used to repay debt. The literature on 'mobilization' – or economic planning under conditions of severely impaired capacity – suggests dealing with the remaining excess income not only through taxation, but also through different forms of voluntary and forced savings programs (Levey, 2020; also Keynes, 2010 [1940]). Typically, these savings promise "deferred consumption" (Nersisyan and Wray, 2021), but in a degrowth transition, consumption would have to be foregone or transferred outside the market economy.

This is where complementary currencies could play a role: Consider special-purpose currencies that constitute claims on non-essential public goods, such as "care currencies" (Hayashi, 2012; Lee et al., 2020) or "carbon coins" (Robinson, 2020). Making such currencies attractive for savings could alleviate inflationary pressure by shifting effective demand to the non-market economy (Olk, 2023).

Degrowth policies that reduce private consumption require the prior construction of truly universal public provisioning systems. Notably, public provision of housing, transport and food can alleviate inflationary pressures in those sectors that are particularly sensitive to cost increases driven by ecological crises, and susceptible to price gouging and rent extraction (Olk et al., 2023). Cheap or free-to-use public services not only reduce the cost of living directly, they may also reduce overall demand for energy and resources because they satisfy basic needs more efficiently than the market-based provisioning systems they replace.

In the short run, rolling out public services may increase demand because it leaves households with excess income. In the long run, the construction of public provisioning systems may 'crowd out' private investment and consumption (Kalecki, 1971 [1943]). Excess demand over and above what is necessary to satisfy everyone's needs is a consequence of artificial scarcity, contingent upon a lack of efficient public need satisfiers. As people rely less and less on the monetary economy in their daily lives, this allows them to reduce the time they commit to wage labor. Needs satisfaction outside of the market economy, paired with reduced working time, will eventually become a key driver of decreasing effective demand.

### 5.4. The job guarantee

As long as wage labour is necessary for people to meet their basic needs, it is necessary to mitigate chronic unemployment without relying upon economic growth. Degrowth seeks to free people from the threat of unemployment, and thereby overcome the central role that wage work plays in society more generally (Parrique, 2019).

Mainstream economics posits that income distribution is determined by technical aspects of production, and thus the only way to alleviate poverty is to grow GDP. If instead we realize that the distribution between incomes is socially and institutionally conditioned, we can consider other methods to affect income distribution that are not predicated on growth (Minsky, 1973). The job guarantee is such a method.

MMT economists have long laid the groundwork for a well-developed job guarantee – a "permanent, federally funded, and locally

administered program that supplies voluntary employment opportunities on demand for all who are ready and willing to work at a living wage" (Wray et al., 2018, p. 35). These jobs follow national guidelines (around, for example, inclusion, labor standards and sustainability), while decisions on specific work are made at the local level through participative democratic processes. Social exclusion is addressed by providing a living wage for those who are least likely to gain employment through aggregate pump-priming of the economy (Tcherneva, 2018, 2020; Wray, 1986). Central governments are the only institutions that can divorce the profitability of hiring from the decision to hire. Therefore, they can stabilize employment during recessions, and mitigate wage-driven inflation via compositional changes in employment, rather than relying on a "reserve army" of unemployed workers (Mitchell, 1998). The MMT job guarantee is 'a last resort program', meaning it is intended only for those who are unable to find employment in the current labor market, and not to replace existing private or public sector employment (Tcherneva, 2020). Nonetheless, as a backstop of guaranteed public employment, a job guarantee also sets a benchmark of labor standards for the private industry to match – including wages, benefits, working hours, and structures of participation and decision-making in the workplace. Providing a floor to wage rates and a guarantee of labor income creates a check on increasing inequality, and can help to reduce private debt levels, both of which become even more important in a non-growing economy.

It can thus provide a measure of stability and needs satisfaction, especially during economic contraction. In response to the economic crisis of 2001, Argentina ran a limited federal job guarantee program which provided necessary services to largely poor communities. The vast majority of workers came from the bottom 20% of income distribution and had at most a high school level education. Women accounted for nearly 75% of participants (Tcherneva and Wray, 2005). "The unemployed themselves initiated, organized, and staffed projects in their communities", including child or elderly care, health program support, community and school kitchens and recycling programs (Tcherneva, 2012, p. 15). The program challenged gendered stereotypes about what is productive and unproductive work, and who is employable or unemployable.

Existing literature on the potential for a 'green' job guarantee has focused on the potential to shift labor away from extractive industries and toward renewables (Forstater, 2005), and as a tool to increase worker and union support for a green transition. While these are important points, a 'Degrowth Job Guarantee' can and must go further (Parrique, 2018; Schneider, 2021; Unti, 2018). In its more expansive imaginary, a job guarantee focuses on *social provisioning*, rather than *profit*. A government-funded job guarantee can mobilize labour as a public good to serve social and environmental aims through the build-out and maintenance of public provisioning systems. In addition to localizing systems of production and distribution, the job guarantee locally embeds value creation, as participants decide *what* to value, and then *generate* that value.

If combined with robust public sector programs that are not a 'last resort', a job guarantee may have the potential to drive structural change in the labor market away from material and energy intensive sectors, and toward labor-intensive sectors particularly those oriented around care and repair, organic agriculture, or ecosystem restoral (Last, 2021). Further, work standards can be used to establish working time reductions. These shifts can reduce biophysical throughput while increasing employment.

The job guarantee outlined here is a paradigmatic "non-reformist reform" (Gorz, 1968). It empowers marginalized groups, while demonstrating the feasibility of transcending a market-based organization of work. Critically for degrowth, the job guarantee eliminates one of the strongest growth imperatives, while being a relatively popular policy (Tcherneva, 2018). At the same time, a job guarantee is clearly no panacea, and must be brought into operation with complimentary policies, including regulation on private sector production, a maximum

wage ratio, and caps on capital income (Martin et al., 2023; Minsky, 1973).

Another key policy advocated by many degrowth scholars, and potentially made realizable through an MMT framework, is a Universal Basic Income (e.g. Paulson et al., 2020; Schmelzer et al., 2022:226). Its proponents point out that a UBI would, like a JG, increase the bargaining power of workers vis-à-vis employers (e.g. Wright, 2006:6). A UBI is potentially complementary with universal public services (Bohnenberger, 2020; Fitzpatrick et al., 2022). However, a UBI should not be regarded as a standalone policy, because it does not, in and of itself, change what is available to consume, nor how it is produced. Whereas a UBI ultimately relies on market mechanisms to meet basic needs (Büchs, 2021; Santens, 2021), UBS and JG both allow for a higher degree of democratic decision-making over the allocation of resources and labour, the conditions of production, and the access to need satisfiers.

## 6. Conclusion

We have proposed a synthesis of MMT and degrowth and outlined a common framework for the shared policy proposals. This symbiosis, illustrated in Fig. 2, should be seen as a starting point for further inquiries. It certainly does not encompass all constituent elements of MMT nor of degrowth.

The key theoretical contribution of our framework can be summed up as follows: Price stability depends on the relationship between total spending and total resource use, mediated by factors that include the resource efficiency of provisioning systems, the bargaining power of social classes, and the distribution of purchasing power. A degrowth transition will be *stable* only if total spending decreases in balance with the necessary reduction of resource use. It will be *just* only if democratic institutions can bring about changes in the intermediating variables.

### 6.1. Limitations and further research

We have confined our analysis to MMT-informed degrowth policies adequate for states situated in the industrial core of the world system, and ignored their effects on international trade, capital flows, and exchange rates. In general, nothing suggests that similar policies should not be adequate for peripheral states as well, assuming they achieve effective monetary sovereignty (Sylla, 2023). This implies overcoming import dependency and, in particular, achieving food and energy sovereignty (Wilson, 2022), which is close to what radical development strategies would suggest (Escobar, 2015; Hanaček et al., 2020). As the core relies so strongly on cheap imported resources and labor, building economic sovereignty in the periphery could be an essential trigger for degrowth in the core and the abolition of neocolonial relations of power in the global economy (Hickel, 2021a).

In addition, core states face a moral obligation arising from historical responsibility for (neo-)colonial plunder and the displacement of social and ecological burdens over centuries (Hickel et al., 2021b; Táíwò, 2022). A program for monetary decolonization should involve reparations, debt cancellation, and the issuance of (Green) Special Drawing Rights (Aglietta and Coudert, 2019; Ferron and Morel, 2014; Ocampo, 2017; UNCTAD, 2019), as well as coordination of monetary and fiscal policies between core and periphery countries (Althouse et al., 2020).

Importantly, only central governments have monetary sovereignty, while federal, local, and municipal authorities must be funded either through transfers from the central government or through local taxes. A shrinking tax base would therefore entail higher transfers. At the same time, degrowth advocates call for shifting democratic decision-making power to the municipal level (Parrique, 2018; pp. 258, 286, 365; Zografos, 2014), as with the administration of a job guarantee. One open question remains how centralized state funding can coexist harmoniously with more localized decision-making.

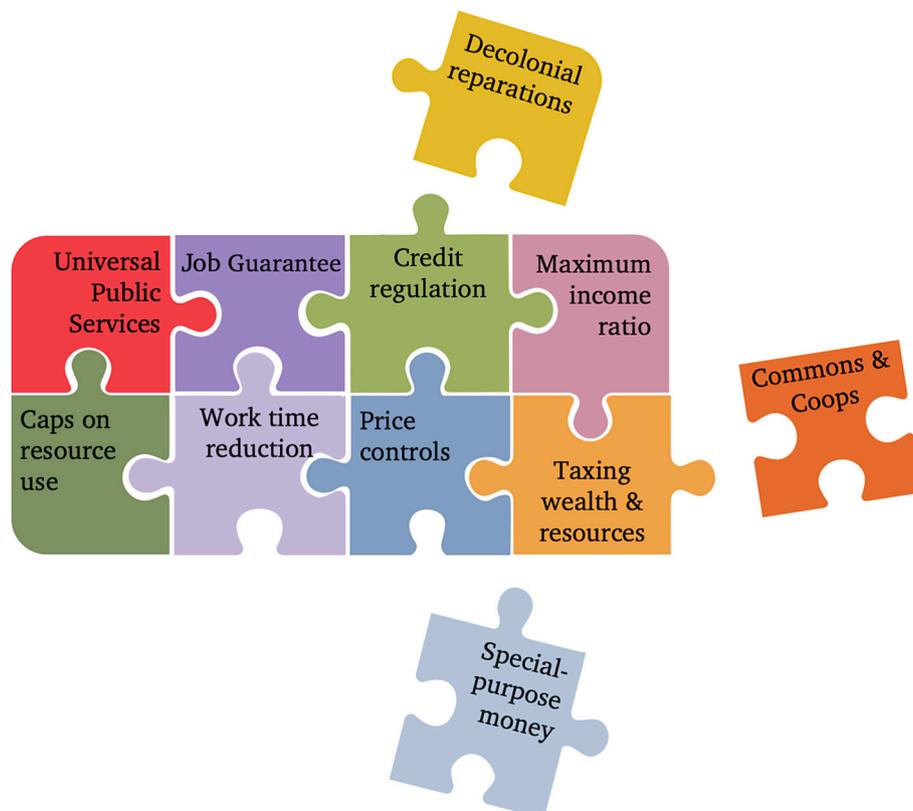


Fig. 2. Degrowth and MMT: a symbiotic policy framework.

In our discussion of policy instruments, we have focused on inflation control and neglected deflationary pressures that could, for example, result from asset stranding or private investment strikes during a degrowth transition. Deflation and underemployment of resources seem less of a problem because they increase the macroeconomic space for public spending on social and ecological programs. Still, a deflationary degrowth scenario warrants further study.

Other opportunities for further research include a deeper analysis of possible transition paths out of the current macro-financial regime. An important task for MMT economists would be to elaborate upon the inclusion of ecological constraints to public spending into their framework. Finally, integrating the perspective presented in this article into ecological macroeconomic models and IAMs, which lack an adequate perspective on public finance, would allow policymakers to consider more viable transition pathways.

## 6.2. Strategic implications

The theoretical complementarity between MMT and degrowth, their policy overlap, and their shared opposition to mainstream economic hegemony may provide the glue necessary to form a strategic symbiosis. This symbiosis can help mobilize popular demands for reforms that do not intend to stabilize capitalism, but instead to enable a transition from it (Gorz, 1968).

If there are no limits to economic growth, increased government spending on public goods and services can boost both public and private economic activity. When there are democratically defined limits to growth, that same spending will shift resources from the private to the public domain, intensifying distributional class conflicts. A government adopting MMT-informed degrowth policies may effectively use its unique macro-financial position to socialize the means of production (see also Marx and Engels, 2002 [1848], pp. 26, 51; Lenin, 1972 [1917]).

Together, MMT and degrowth can free our political imagination from the myths of reliance on perpetual growth and of financial constraints to public spending on social and ecological objectives. Clearly, the question is no longer whether the state *has* extraordinary latent capacities, but what *objectives* these capacities should be oriented toward. A degrowth transition requires a comprehensive democratization of monetary and fiscal policy. This is entirely a question of power relations and political struggles. Aggressive quantitative easing over the last decade offers convincing evidence that no financial constraints would prevent the state from providing a job guarantee, shutting down fossil industries, preserving ecosystems, and building out universal public services. As a popular climate justice slogan puts it: “If the planet was a bank, you would have saved it already”.

## Declaration of Competing Interest

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

## Data availability

No data was used for the research described in the article.

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## References

- Aglietta, M., Coudert, V., 2019. The dollar and the transition to sustainable development: from key currency to multilateralism. CEPII Policy Brief 26.
- Aigner, E., Cahen-Fourot, L., Schneider, C., 2022. Monetary and financial strategies for degrowth. In: Barlow, N., Regen, L., et al. (Eds.), *Degrowth & Strategy: How to Bring About Social-Ecological Transformation*. MayFly.
- Alcott, B., 2013. Should degrowth embrace the job guarantee? *J. Clean. Prod.* 38, 56–60.
- Althouse, J., Guarini, G., Gabriel Porcile, J., 2020. Ecological macroeconomics in the open economy: sustainability, unequal exchange and policy coordination in a Center-Periphery model. *Ecol. Econ.* 172, 106628 <https://doi.org/10.1016/j.ecolecon.2020.106628>.
- Ament, J., 2020. An ecological monetary theory. *Ecol. Econ.* 171, 106421.
- Andersson, J.O., 2010. Basic income from an ecological perspective. *Basic Income Stud.* 4 (2).
- Baer, M., Campiglio, E., Deyris, J., 2021. It takes two to dance: institutional dynamics and climate-related financial policies. *Ecol. Econ.* 190, 107210.
- Bell, S., 2001. The role of the state and the hierarchy of money. *Camb. J. Econ.* 25, 149–161.
- Berg, M., Hartley, B., Richters, O., 2015. A stock-flow consistent input–output model with applications to energy price shocks, interest rates, and heat emissions. *New Journal of Physics* 17 (1), 015011.
- Bernal, A., 2021. Inflationary Pressures in the Time of Covid-19: MMT as a Theory of Inflation. Institute for Sustainable Prosperity Working Paper.
- Bohnenberger, K., 2020. Money, vouchers, public infrastructures? A framework for sustainable welfare benefits. *Sustainability* 12 (2), 596.
- Bolton, P., Despres, M., Da Silva, L.A.P., Samama, F., Svartzman, R., 2020. The Green Swan. BIS Books. Bank for International Settlements. <https://www.bis.org/publ/othp31.pdf>.
- Bonizzi, B., Kaltenbrunner, A., Michell, J., 2019. Monetary sovereignty is a spectrum: modern monetary theory and developing countries. *Real World Econ. Rev.* 89, 16.
- Braun, B., 2020. Central banking and the infrastructural power of finance: the case of ECB support for repo and securitization markets. *Soc. Econ. Rev.* 18 (2), 395–418. <https://doi.org/10.1093/ser/mwy008>.
- Braun, B., Gabor, D., 2020. Central banking, shadow banking, and infrastructural power 1. In: *The Routledge International Handbook of Financialization*. Routledge, pp. 241–252.
- Büchs, M., 2021. Sustainable welfare: how do universal basic income and universal basic services compare? *Ecol. Econ.* 189, 107152.
- Buck, H.J., 2019. *After Geoengineering. Climate Tragedy, Repair and Restoration*. Verso Books.
- Cahen-Fourot, L., Lavoie, M., 2016. Ecological monetary economics: a post-Keynesian critique. *Ecol. Econ.* 6.
- Campiglio, E., Godin, A., Kinsella, S., 2015, June. The economic implications of the transition to a low-carbon energy system: a stock-flow consistent model. In: *Presentation at the 11th Biennial Conference of the European Society for Ecological Economics*, Leeds, Vol. 30, pp. 06–03.
- Christophers, B., 2021. Fossilised capital: price and profit in the energy transition. *New Polit. Econ.* 1–14.
- Coote, A., Percy, A., 2020. *The Case for Universal Basic Services*. John Wiley & Sons.
- Cosme, I., Santos, R., O'Neill, D.W., 2017. Assessing the degrowth discourse: a review and analysis of academic degrowth policy proposals. *J. Clean. Prod.* 149, 321–334.
- Creutzig, F., Roy, J., Lamb, W.F., Azevedo, I.M., De Bruin, W.B., Dalkmann, H., Edelenbosch, O.Y., Geels, F.W., Grubler, A., Hepburn, C., 2018. Towards demand-side solutions for mitigating climate change. *Nat. Clim. Chang.* 8 (4), 260–263.
- Dafermos, Y., Gabor, D., Michell, J., 2021. The wall street consensus in pandemic times: what does it mean for climate-aligned development? *Canadian Journal of Development Studies/Revue Canadienne d'études Du Développement* 42 (1–2), 238–251.
- D'Alessandro, S., Cieplinski, A., Distefano, T., Dittmer, K., 2020. Feasible alternatives to green growth. *Nat. Sustain.* 3 (4), 329–335. <https://doi.org/10.1038/s41893-020-0484-y>.
- Dantas, F., Wray, L.R., 2022. Secular stagnation: As good as it gets?. In: *Handbook of Economic Stagnation*. Academic Press, pp. 299–320.
- Davies, W., 2016. *The Limits of Neoliberalism: Authority, Sovereignty and the Logic of Competition*. Sage.
- de Paula, L.F., Fritz, B., Prates, D.M., 2017. Keynes at the periphery: currency hierarchy and challenges for economic policy in emerging economies. *J. Post Keynesian Econ.* 40 (2), 183–202. <https://doi.org/10.1080/01603477.2016.1252267>.
- Dullien, S., Weber, I.M., 2022, February 15. Der Staat muss den Gaspreis deckeln. *Süddeutsche Zeitung*, 12, 13–25. <https://www.sueddeutsche.de/wirtschaft/inflati-on-energiepreise-gas-subventionen-1.5526823?reduced=true> (last accessed 04/03/2023).
- Dyson, B., Hodgson, G., Lerven, F., 2016. *Sovereign Money. An Introduction*. Report, Positive Money. <http://positivemoney.org/wp-content/uploads/2016/12/SovereignMoney-AnIntroduction-20161214.pdf>.
- Ehnts, D., 2022. *Modern Monetary Theory*. Springer, Eine Einführung.
- Elliott, D., Feldberg, G., Lehnert, A., 2013. The history of cyclical macroprudential policy in the United States. *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.2269090>.
- Escobar, A., 2015. Degrowth, postdevelopment, and transitions: a preliminary conversation. *Sustain. Sci.* 10 (3), 451–462.
- Espagne, E., 2018. Money, finance and climate: the elusive quest for a truly integrated assessment model. *Comp. Econ. Stud.* 60 (1), 131–143.

- Fanning, A.L., O'Neill, D.W., Hickel, J., Roux, N., 2022. The social shortfall and ecological overshoot of nations. *Nat. Sustain.* 5 (1), 26–36.
- Farley, J., Burke, M., Flomenhof, G., Kelly, B., Murray, D.F., Posner, S., Putnam, M., Scanlan, A., Witham, A., 2013. Monetary and fiscal policies for a finite planet. *Sustainability* 5 (6), 2802–2826.
- Felipe, J., Fullwiler, S., 2021. How 'monetization' really works—examples from three Asian nations' responses to Covid-19. *Rev. Political Econ.* 1–23.
- Ferron, C., Morel, R., 2014. Smart Unconventional Monetary (SUMO) Policies: Giving Impetus to Green Investment. *Climate Report* no. 46. (INIS-FR-16-1447).
- Feygin, J., 2021, January 9. The Deflationary Bloc. *Phenomenal World*. <http://reparti.fr/ee/fr/yakovfeygin121.pdf> (last accessed 04/03/2023).
- Fisher, I., 1935. 100% Money. Adelphi Publication.
- Fitzpatrick, N., Parrique, T., Cosme, I., 2022. Exploring degrowth policy proposals: a systematic mapping with thematic synthesis. *J. Clean. Prod.* 132764.
- Fontana, G., Sawyer, M., 2016. Full reserve banking: more 'cranks' than 'brave heretics'. *Camb. J. Econ.* 40 (5).
- Forstater, M., 2005. The Case for an Environmentally Sustainable Jobs Program (No. 05-1). *Levy Economics Institute*.
- Forstater, M., Mosler, W., 2005. The natural rate of interest is zero. *J. Econ. Issues* 39 (2), 535–542.
- Fullwiler, S., 2020. When the interest rate on the National Debt is a policy variable (and "printing money" does not apply). *Public Budg. Financ.* pbaf.12249.
- Gabor, D., 2021. Revolution Without Revolutionaries: Interrogating the Return of Monetary Financing [Preprint]. *SocArXiv*. <https://doi.org/10.31235/osf.io/ja9bk>.
- Georgescu-Roegen, Nicholas, 1971. *The Entropy Law and the Economic Process*. Harvard University Press.
- Godin, A., 2012. Guaranteed green jobs: sustainable full employment. *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.2060326>.
- Gore, T., Ghosh, E., Nazareth, A., Kartha, S., Dabi, N., 2021. Carbon Inequality in 2030: Per Capita Consumption Emissions and the 1.5 °C Goal.
- Gorz, A., 1968. Reform and revolution. *Socialist Regist.* 5.
- Gorz, A., 1968. Strategy for labor. A radical proposal. *Sci. Soc.* 32 (4).
- Gough, I., 2019. *Heat, Greed and Human Need: Climate Change, Capitalism and Sustainable Wellbeing*. Edward Elgar Publishing.
- Graeber, D., 2011. *Debt: The First Five Thousand Years*. Melville House.
- Haber, H., Wiedenhofer, D., Virág, D., Kalt, G., Plank, B., Brockway, P., Creutzig, F., 2020. A systematic review of the evidence on decoupling of GDP, resource use and GHG emissions, part II: synthesizing the insights. *Environ. Res. Lett.* 15 (6), 065003.
- Hail, S., 2018. *Economics for Sustainable Prosperity*. Palgrave Macmillan.
- Hail, S., 2022. Paying for a green new Deal: An introduction to modern monetary theory. In: *Sustainability and the New Economics*. Springer, Cham, pp. 279–302.
- Hanaček, K., Roy, B., Avila, S., Kallis, G., 2020. Ecological economics and degrowth: proposing a future research agenda from the margins. *Ecol. Econ.* 169, 106495.
- Hardt, L., O'Neill, D.W., 2017. Ecological macroeconomic models: assessing current developments. *Ecol. Econ.* 134, 198–211.
- Hartley, T., Kallis, G., 2021. Interest-bearing loans and unpayable debts in slow-growing economies: insights from ten historical cases. *Ecol. Econ.* 188, 107132.
- Hayashi, M., 2012. Japan's Fureai Kippu time-banking in elderly care: origins, development, challenges and impact. *Int. J. Community Curr. Res.* 16 (A), 30–44.
- Henke, S., 2017. *Fließendes Geld für eine gerechtere Welt: Warum wir ein alternatives Geldsystem brauchen, wie es funktioniert und welche Auswirkungen es hat*. Tectum Wissenschaftsverlag.
- Hickel, J., 2019. Degrowth: a theory of radical abundance. *Real-World Econ. Rev.* 87 (19), 54–68.
- Hickel, J., 2020, September 23. Degrowth and MMT - A Thought Experiment. <https://www.jasonhickel.org/blog/2020/9/10/degrowth-and-mmt-a-thought-experiment> (last accessed 04/03/2023).
- Hickel, J., 2021, August 9. How to achieve full decolonization. *New Internationalist* 15. <https://newint.org/features/2021/08/09/money-ultimate-decolonizer-fjf> (last accessed 04/03/2023).
- Hickel, J., 2021, November 15. What Would it Look Like if we Treated Climate Change as an Actual Emergency? <https://www.currentaffairs.org/2021/11/what-would-it-look-like-if-we-treated-climate-change-as-an-actual-emergency> (last accessed 04/03/2023).
- Hickel, J., Kallis, G., 2020. Is green growth possible? *New Polit. Econ.* 25 (4), 469–486. <https://doi.org/10.1080/13563467.2019.1598964>.
- Hickel, J., Brockway, P., Kallis, G., Keyßer, L., Lenzen, M., Slamersák, A., Steinberger, J., Ürge-Vorsatz, D., 2021a. Urgent need for post-growth climate mitigation scenarios. *Nat. Energy* 6 (8), 766–768.
- Hickel, J., Sullivan, D., Zoomkawala, H., 2021b. Plunder in the post-colonial era: quantifying drain from the global south through unequal exchange, 1960–2018. *New Polit. Econ.* 26 (6), 1030–1047.
- Hockett, R.C., 2019. Finance without financiers. *Polit. Soc.* 47 (4), 491–527. <https://doi.org/10.1177/0032329219882190>.
- IEA, 2021. *World Energy Investment 2021. Executive Summary*. International Energy Agency. <https://www.iea.org/reports/world-energy-investment-2021/executive-summary>.
- Ingham, G., 2002. 'Babylonian madness': on the historical and sociological origins of money. In: *What Is Money?* Routledge, pp. 26–51.
- IPCC, 2022. *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. <https://www.ipcc.ch/report/ar6/wg3/>.
- Jackson, T., Victor, P.A., 2019. *LowGrow SFC - A Stock-Flow-Consistent Ecological Macroeconomic Model for Canada*. CUSP Working Paper No. 16. [https://www.researchgate.net/profile/Tim-Jackson-2/publication/338804271\\_LowGrow\\_SFC\\_A\\_stock-flow-consistent\\_ecological\\_macro-economic\\_model\\_for\\_Canada/links/5e2b2c5d4585150ee7808bb6/LowGrow-SFC-A-stock-flow-consistent-ecological-macro-economic-model-for-Canada.pdf](https://www.researchgate.net/profile/Tim-Jackson-2/publication/338804271_LowGrow_SFC_A_stock-flow-consistent_ecological_macro-economic_model_for_Canada/links/5e2b2c5d4585150ee7808bb6/LowGrow-SFC-A-stock-flow-consistent-ecological-macro-economic-model-for-Canada.pdf).
- Kaboub, F., 2006. *A Roadmap to Full Employment and Price Stability in Developing Countries: The Case of Tunisia*. University of Missouri-Kansas City.
- Kaboub, F., 2008. Elements of a radical counter-movement to neoliberalism: employment-led development. *Rev. Radic. Polit. Econ.* 40 (3), 220–227.
- Kaboub, F., 2020, October 26. Green and just. *New Internationalist*, 26. <https://newint.org/features/2020/08/11/green-and-just> (last accessed 04/03/2023).
- Kaboub, F., 2021, August 3. Longing for genuine global solidarity. In: *Real Progressives*. [https://realprogressives.org/longing-genuine-global-solidarity/?fbclid=IwAR1FpdkrRti-XAeMri-5MUUpONXIn6bilgMZiDzhBmgkLctliAM\\_80AVV7g](https://realprogressives.org/longing-genuine-global-solidarity/?fbclid=IwAR1FpdkrRti-XAeMri-5MUUpONXIn6bilgMZiDzhBmgkLctliAM_80AVV7g) (last accessed 04/03/2023).
- Kaboub, F., Forstater, M., Kelsay, M., 2015. The cost of unemployment and the job guarantee alternative in Saudi Arabia. *Policy Rep.* 101.
- Kalecki, M., 1971. *Selected Essays on the Dynamics of the Capitalist Economy 1933–1970*.
- Kallis, G., Kerschner, C., Martinez-Alier, J., 2012. The economics of degrowth. *Ecol. Econ.* 84, 172–180. <https://doi.org/10.1016/j.ecolecon.2012.08.017>.
- Kelton, S., 2020. *The Deficit Myth: Modern Monetary Theory and how to Build a Better Economy*. Hachette UK.
- Keynes, J.M., 2010 [1940]. How to pay for the war. In: *Essays in Persuasion*. Springer, pp. 367–439.
- Knapp, G.F., 1909. *Die Landarbeiter in Knechtschaft und Freiheit: Gesammelte Vorträge*. Duncker & Humblot.
- Knapp, G.F., 1918. *Die staatliche Theorie des Geldes*. Forgotten Books.
- Koch, M., 2019. The state in the transformation to a sustainable postgrowth economy. *Environ. Polit.* 1–19 <https://doi.org/10.1080/09644016.2019.1684738>.
- Koch, M., 2022. State-civil society relations in Gramsci, Poulantzas and Bourdieu: strategic implications for the degrowth movement. *Ecol. Econ.* 193, 107275.
- Koch, M., 2022. Social policy without growth: Moving towards sustainable welfare states. *Social Policy and Society* 21 (3), 447–459.
- Koddenbrock, K., Sylla, N.S., 2020. Towards a political economy of monetary dependency. *MaxPo Discus. Pap.* 39.
- Lainä, P., 2015. Proposals for full-reserve banking: a historical survey from David Ricardo to Martin Wolf. *Econ. Thought* 4 (2), 1–19.
- Lapavistas, C., Aguilá, N., 2020. Modern monetary theory on money, sovereignty, and policy: a marxist critique with reference to the Eurozone and Greece. *Jpn Polit. Econ.* 1–27 <https://doi.org/10.1080/2329194X.2020.1855593>.
- Last, N., 2021. *Good forms of collectivity: low-carbon care work and a federal job guarantee*. Los Angeles Rev. Books.
- Lavoie, M., 2013. The monetary and fiscal nexus of neo-chartalism: a friendly critique. *J. Econ. Issues* 47 (1), 1–32.
- Lawn, P., 2010. Facilitating the transition to a steady-state economy: some macroeconomic fundamentals. *Ecol. Econ.* 69 (5), 931–936.
- Lee, C., Burgess, G., Kuhn, I., Cowan, A., Lafortune, L., 2020. Community exchange and time currencies: a systematic and in-depth thematic review of impact on public health outcomes. *Public Health* 180, 117–128.
- Lenin, V.I., 1972. Can the Bolsheviks retain state power? *Prosveshcheniye* No. 1-2. In: *Lenin's Collected Works*, Progress Publishers, Moscow, Vol. 26, pp. 87–136 [1917, October 14].
- Levey, S., 2020. *Mobilization Theory: Some Lessons from the Literature for Today* (p. 38). Global Institute for Sustainable Prosperity. <http://www.global-isp.org/wp-content/uploads/WP-126.pdf>.
- Mackintosh, J., 2021, November 21. Modern monetary theory Isn't the future. It's here now. *Wall Street J.* <https://www.wsj.com/articles/modern-monetary-theory-isnt-the-future-its-here-now-11637446538> (last accessed 04/03/2023).
- Malm, A., 2020. *Corona, climate, chronic emergency: War communism in the twenty-first century*. Verso Books.
- Martin, F., de Wilmars Sybille, M., Kevin, M., 2023. Unlocking the potential of income and wealth caps in post-growth transformation: a framework for improving policy design. *Ecol. Econ.* 208, 107788.
- Marx, K., Engels, F., 2002 [1948]. *The Communist Manifesto*. <https://www.marxists.org/archive/marx/works/1848/communist-manifesto/index.htm> (last accessed 04/03/2023).
- Mastini, R., Kallis, G., Hickel, J., 2021. A green new deal without growth? *Ecol. Econ.* 179, 106832.
- Max-Neef, M.A., Elizalde, A., Hopenhayn, M., 1991. *Human Scale Development: Conception, Application and Further Reflections*. The Apex Press.
- McKinsey, 2021. *Net-Zero Europe: Decarbonization Pathways and Socioeconomic Implications*. [https://www.mckinsey.com/business-functions/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring?cid=net-zero-pse-gaw-mst-mck-oth-2201&gclid=Cj0KCQjwPv2TBhDoARIsALBnVnksXa7-y\\_ak7FwC7LcOkW9qfgHczurH3lRtzruskib4eregYulDpwaAkBJEALw\\_wcB&gclid=aw.ds](https://www.mckinsey.com/business-functions/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring?cid=net-zero-pse-gaw-mst-mck-oth-2201&gclid=Cj0KCQjwPv2TBhDoARIsALBnVnksXa7-y_ak7FwC7LcOkW9qfgHczurH3lRtzruskib4eregYulDpwaAkBJEALw_wcB&gclid=aw.ds) (last accessed 04/03/2023).
- Merchant, J., 2021, February. The money theory of the state. Reflections on modern monetary theory. *Brooklyn Rail*. <https://brooklynrail.org/2021/02/field-notes/The-Money-Theory-of-the-State-Reflections-on-Modern-Monetary-Theory> (last accessed 04/03/2023).
- Millward-Hopkins, J., Steinberger, J.K., Rao, N.D., Oswald, Y., 2020. Providing decent living with minimum energy: a global scenario. *Glob. Environ. Chang.* 65, 102168 <https://doi.org/10.1016/j.gloenvcha.2020.102168>.

- Minsky, H.P., 1973. The strategy of economic policy and income distribution. *Ann. Am. Acad. Polit. Soc. Sci.* 409 (1), 92–101. <https://doi.org/10.1177/000271627340900110>.
- Mitchell, W.F., 1998. The buffer stock employment model and the NAIRU: the path to full employment. *J. Econ. Issues* 32 (2), 547–555.
- Mitchell, W., Watts, M.J., 2003. In Defence of the Job Guarantee. Centre of Full Employment and Equity, pp. 03–12.
- Mitchell, W., Wray, L.R., Watts, M., 2016. *Modern Monetary Theory and Practice: An Introductory Text*. Centre of Full Employment and Equity Newcastle, NSW.
- Monnet, E., 2019. *Controlling Credit: Central Banking and the Planned Economy in Postwar France, 1948–1973*. Cambridge University Press.
- Musthaq, F., 2021. Unconventional central banking and the politics of liquidity. *Rev. Int. Polit. Econ.* 1–26.
- Nersisyan, Y., Wray, L.R., 2021. Can we afford the green new deal? *J. Post Keynesian Econ.* 44 (1), 68–88.
- Nersisyan, Y., Wray, L.R., 2022. Is It Time for Rate Hikes? The Fed Cannot Engineer a Soft Landing but Risks Stagflation by Trying. Public Policy Brief No. 157. Levy Economics Institute. [https://www.levyinstitute.org/pubs/ppb\\_157.pdf](https://www.levyinstitute.org/pubs/ppb_157.pdf).
- Ocampo, A.J., 2017. *Resetting the International Monetary (Non) System*. Oxford University Press.
- Olk, C., 2023. Where are (complementary) Currencies in the Global Hierarchy of Money? (forthcoming).
- Olk, C., Söding, T., 2022, April 12. Weniger Energie wagen. *Analyse Kritik* 681. <https://www.akweb.de/politik/deutschland-energiepolitik-energie-wende-degrowth-em-bargo-russland-ukraine-krieg/>.
- Olk, C., Schneider, C., Hickel, J., 2023, January 25. How universal public services can end the cost-of-living crisis. *New Statesman*. <https://www.newstatesman.com/spotlight/cost-of-living-crisis/2023/01/state-end-cost-of-living-crisis-climate-change> (last accessed 04/03/2023).
- Otto, I.M., Kim, K.M., Dubrovsky, N., Lucht, W., 2019. Shift the focus from the super-poor to the super-rich. *Nat. Clim. Change* 9 (2), 82–84.
- Parrique, T., 2018. Community Allowance for Resilient Economies (CARE): A Job Guarantee for Degrowth. CERDI, University Clermont Auvergne. [https://cerdi.uca.fr/medias/fichier/parrique-2018-degrowth-and-the-job-guarantee-1538068277035-pd?ID\\_FICHE=9501&INLINE=FALSE](https://cerdi.uca.fr/medias/fichier/parrique-2018-degrowth-and-the-job-guarantee-1538068277035-pd?ID_FICHE=9501&INLINE=FALSE) (last accessed 04/03/2023).
- Parrique, T., 2019. *The Political Economy of Degrowth* [Doctoral Dissertation, Université Clermont Auvergne; Stockholms Universitet]. <https://tel.archives-ouvertes.fr/tel-02499463>.
- Parrique, T., 2021, August 11. Welcome to degrowth: a response to Kenta Tsuda. <https://timotheeparrique.com/a-response-to-kenta-tsuda-welcome-to-degrowth/> (last accessed 04/03/2023).
- Pasche, M., 2018. Degrowth and Sustainable Public Finance. Working paper. <https://mpira.uni-muenchen.de/87109>.
- Paulson, S., D'Alisa, G., Demaria, F., Kallis, G., 2020. *The Case for Degrowth*. John Wiley & Sons.
- Pettifor, A., 2020. *The Case for the Green New Deal*. Verso Books.
- Pigeaud, F., Sylla, N.S., 2018. L'arme invisible de la FrancAfrique: Une histoire du Franc CFA. La Découverte.
- Pollin, R., 2019. Advancing a viable global climate stabilization project: degrowth versus the green new deal. *Rev. Radic. Political Econ.* 51 (2), 311–319.
- Pozsar, Z., 2014. Shadow Banking: The Money View. Working paper. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2476415](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2476415).
- Rezaei, A., Stagl, S., 2016. Ecological macroeconomics: introduction and review. *Ecol. Econ.* 121, 181–185.
- Richters, O., 2019. Growth imperatives: substantiating a contested concept. *Struct. Chang. Econ. Dyn.* 12.
- Richters, O., Siemoneit, A., 2017. Consistency and stability analysis of models of a monetary growth imperative. *Ecol. Econ.* 136, 114–125. <https://doi.org/10.1016/j.ecolecon.2017.01.017>.
- Robinson, K.S., 2020. *The Ministry for the Future*. Hachette UK.
- Röpke, I., 2017. Sustainability and the governance of the financial system: what role for full reserve banking? *Environ. Policy Gov.* 27 (3), 177–192.
- Santens, S., 2021. Why we need modern monetary theory (MMT) and why it needs universal basic income (UBI). *Swamp*. <https://vocal.media/theSwamp/why-we-need-modern-monetary-theory-mmt-and-why-it-needs-universal-basic-income-ubi> (last accessed 04/03/2023).
- Sawyer, M., 2019. Modern monetary theory: is there any added value? *Real-World Economic Reviews* 89, 167–179.
- Schmelzer, M., Vetter, A., Vansintjan, A., 2022. *The future is degrowth: A guide to a world beyond capitalism*. Verso Books.
- Schneider, C., 2021, March 5. A Job Guarantee for Social Equity and Environmental Sustainability. WIFO: Sustainability, Work and Growth, Vienna University of Economics and Business.
- Schneider, C., Miess, M., 2023. Politicizing the Monetary Provisioning System. Sustainability: Science, Practice and Policy (forthcoming).
- Seidl, I., Zahrt, A. (Eds.), 2010. *Postwachstumsgesellschaft: Konzepte für die Zukunft*. Metropolis-Verlag.
- Semienuk, G., Campiglio, E., Mercure, J.F., Volz, U., Edwards, N.R., 2021. Low-carbon transition risks for finance. *Wiley Interdisciplinary Reviews: Climate Change* 12 (1), e678.
- Semmler, W., Maurer, H., Bonen, A., 2018. An extended integrated assessment model for mitigation and adaptation policies on climate change. In: *Control Systems and Mathematical Methods in Economics*. Springer, Cham, pp. 297–317.
- Solé, J., García-Olivares, A., Turiel, A., Ballabrera-Poy, J., 2018. Renewable transitions and the net energy from oil liquids: a scenarios study. *Renew. Energy* 116, 258–271.
- Steele, G., 2020. *The New Money Trust: How Large Money Managers Control Our Economy and What We Can Do About It* (No. 8; Working Paper Series on Corporate Power). American Economic Liberties Project. <https://www.economicliberties.us/our-work/new-money-trust/>.
- Svartzman, R., Althouse, J., 2020. Greening the international monetary system? Not without addressing the political ecology of global imbalances. *Rev. Int. Polit. Econ.* 1–26. <https://doi.org/10.1080/09692290.2020.1854326>.
- Svartzman, R., Dron, D., Espagne, E., 2019. From ecological macroeconomics to a theory of endogenous money for a finite planet. *Ecol. Econ.* 162, 108–120.
- Svartzman, R., Ament, J., Barmes, D., Erickson, J.D., Farley, J., Guay-Boutet, C., Kosoy, N., 2020. Money, interest rates and accumulation on a finite planet: Revisiting the 'monetary growth imperative' through institutionalist approaches. In: *Sustainable Wellbeing Futures*. Edward Elgar Publishing.
- Sylla, N.S., 2023. For a Full and Decent Employment in Africa: The Role of a Job Guarantee. Economic Democracy Initiative Policy Report 2023/01. <https://edi.bard.edu/research/notes/for-a-full-and-decent-employment-in-africa-the-role-of-a-job-guarantee> (last accessed 04/03/2023).
- Táíwó, O.O., 2022. *Reconsidering reparations*. Oxford University Press.
- Tankus, N., 2022. *The New Monetary Policy: Reimagining Demand Management and Price Stability in the 21st Century*. Report, Modern Money Network. <https://files.modernmoney.network/M3F000001.pdf>.
- Tarullo, D.K., 2017. Monetary policy without a working theory of inflation. In: *Hutchins Center Working Paper*, No. 33. [https://www.brookings.edu/wp-content/uploads/2017/10/es\\_wp33\\_tarullo.pdf](https://www.brookings.edu/wp-content/uploads/2017/10/es_wp33_tarullo.pdf).
- Tcherneva, P., 2012. Beyond full employment: what Argentina's plan jefes can teach us about the employer of last resort. In: Forstater, M., Murray, M.J. (Eds.), *The Job Guarantee: Toward True Full Employment*. Palgrave.
- Tcherneva, P., 2017. "Inequality Update: Who Gains When Income Grows?" Levy Economics Institute Policy Note 2017/1. <https://www.levyinstitute.org/publications/inequality-update-who-gains-when-income-grows> (last accessed 04/03/2023).
- Tcherneva, P.R., 2018. The job guarantee: Design, jobs, and implementation. In: *Levy Economics Institute, Working Papers Series*, 902.
- Tcherneva, P.R., 2020. *The Case for a Job Guarantee*. John Wiley & Sons.
- Tcherneva, P.R., Wray, L.R., 2005. Gender and the job guarantee: the impact of Argentina's jefes program on female heads of poor households. *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.1009594>.
- Thompson, H., 2022. *Disorder: Hard Times in the 21st Century*. Oxford University Press.
- Tooze, A., 2006. *The Wages of Destruction: The Making and Breaking of the Nazi Economy*, Vol. 115. Penguin.
- Tooze, A., 2022, March 3. What if Putin's war regime turns to MMT? *Chartbook*. <https://adamtooze.substack.com/p/chartbook-91-what-if-putins-war-regime?s=r> (last accessed 04/03/2023).
- Tymoigne, E., 2014. Modern money theory, and interrelations between the treasury and central bank: the case of the United States. *J. Econ. Issues* 48 (3), 641–662.
- Tymoigne, E., 2020. Monetary sovereignty: nature, implementation, and implications. *Public Budg. Financ.* <https://doi.org/10.1111/pbaf.12265>.
- Tymoigne, E., Wray, L.R., 2013. Modern Money Theory 101: A Reply to Critics. *Levy Economics Institute, Working Papers Series*, 778. [https://www.levyinstitute.org/pubs/wp\\_778.pdf](https://www.levyinstitute.org/pubs/wp_778.pdf).
- UNCTAD, 2019. *Trade and Development Report: 2019*. United Nations. [https://unctad.org/system/files/official-document/trd2019\\_en.pdf](https://unctad.org/system/files/official-document/trd2019_en.pdf).
- Unti, B.J., 2018. The job guarantee and transformational degrowth. In: Murray, M.J., Forstater, M. (Eds.), *Full Employment and Social Justice*. Springer International Publishing, pp. 63–82. [https://doi.org/10.1007/978-3-319-66376-0\\_3](https://doi.org/10.1007/978-3-319-66376-0_3).
- van Lerven, F., 2016. A Guide to Public Money Creation. *Outlining the Alternatives to Quantitative Easing, Positive Money*. <http://positivemoney.org/wp-content/uploads/2016/04/Public-Money-Creation-2.pdf>.
- van't Klooster, J., 2021. Technocratic Keynesianism: a paradigm shift without legislative change. *New Polit. Econ.* 1–17. <https://doi.org/10.1080/13563467.2021.2013791>.
- Vernengo, M., Pérez Caldentey, E., 2020. Modern money theory (MMT) in the tropics: functional finance in developing countries. *Challenge* 63 (6), 332–348.
- Victor, P.A., 2008. *Managing without Growth: Slower by Design, Not Disaster*. Edward Elgar Publishing.
- Wallerstein, I., 1979. *The Capitalist World-Economy*. Cambridge University Press.
- Weber, I.M., 2021, December 29. Could strategic price controls help fight inflation? *The Guardian*. <https://www.theguardian.com/business/commentisfree/2021/dec/29/inflation-price-controls-time-we-use-it> (last accessed 04/03/2023).
- Weber, I.M., Wasner, E., 2023. Sellers' Inflation, Profits and Conflict: Why Can Large Firms Hike Prices in an Emergency? University of Massachusetts Amherst, Economics Department Working Paper Series. [https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1348&context=econ\\_workingpaper](https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1348&context=econ_workingpaper).
- Weber, I.M., Jauregui, J.L., Teixeira, L., Nassif Pires, L., 2022. Inflation in Times of Overlapping Emergencies: Systemically Significant Prices from an Input-Output Perspective. University of Massachusetts Amherst, Economics Department Working Paper Series, p. 340. <https://doi.org/10.7275/0c5b-6a92>.
- Wilson, J., 2021. Inflation and Productive Capacity – An Empirical Risk Reduction Model. Working paper. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3912154](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3912154).
- Wray, L.R., 1986. *Understanding Modern Money: The Key to Full Employment and Price Stability*. Edward Elgar Pub.
- Wray, L.R., 2015. *Modern Money Theory: A Primer on Macroeconomics for Sovereign Monetary Systems*. Springer.

- Wray, R., 2019. Alternative paths to modern monetary theory. In: Fullbrook, E., Morgan, J. (Eds.), *Modern Monetary Theory and its Critics*. World Economics Association Books.
- Wray, L.R., Nersisyan, Y., 2021. Has Japan been following modern money theory without recognizing it? No! And yes. Levy Economics Institute working paper No. 985. [https://www.levyinstitute.org/pubs/wp\\_985.pdf](https://www.levyinstitute.org/pubs/wp_985.pdf).
- Wray, L.R., Dantas, F., Fullwiler, S., Tcherneva, P., Kelton, S., 2018. Public Service Employment: A Path to Full Employment. Report, Levy Economics Institute. <http://pinguet.free.fr/psefull18.pdf>.
- Wright, E.O., 2006. Two redistributive proposals—universal basic income and stakeholder grants. *Focus* 24 (2), 5–7.
- Zografos, C., 2014. Direct democracy. In: D'Alisa, G., Demaria, F., Kallis, G. (Eds.), *Degrowth: A Vocabulary for a New Era*. Routledge.