



The ecor as global special purpose money: towards a green international monetary system to finance sustainable and just transformation

Nicolás Aguila¹  · Paula Haufe¹  · Joscha Wullweber² 

Received: 9 January 2023 / Accepted: 12 February 2024
© The Author(s) 2024

Abstract

Countries from the Global South face significant challenges to finance sustainable and just transformation. These challenges primarily stem from the hierarchical character of the current international monetary system, which requires Global South countries to obtain US dollars to finance imports of green goods, services, and technologies that they cannot (yet) produce, but require for the sustainable transformation. To overcome this hurdle, we propose the foundation of a green international monetary system with a Green World Central Bank (GWCB) at its centre. The GWCB would be allowed to create its own unit of account, which in our model we refer to as the “ecor”. The ecor would be a global special purpose money similar to Keynes’ ‘bancor’. Ecors would be created by the GWCB in the act of lending, and credited to the GWCB accounts of countries to finance imports needed to combat the climate crisis and advance the process of sustainable and just transformation in their societies and economies. Ecors transferred by deficit countries to surplus countries would only be able to be used within the system, leading to an expansionary adjustment of international imbalances. In this way, the amount of ecors would adjust elastically to the real demands for sustainable change and would not be limited by reserves or by funding conditions from private finance. This would create an international monetary system capable of responding appropriately and flexibly to ease the financing needs of countries around the world, thus enabling them, to effectively address the climate crisis on a globally just basis.

Keywords Green international monetary system · Special purpose money · Sustainable and just transformation

Introduction

Every country around the world is affected by the climate crisis. The sustainable transformation necessary to combat climate change is an all-encompassing process requiring deep economic, political, social, cultural, and ecological changes in the way our society is organized. Recent reports from the UN Intergovernmental Panel on Climate Change (IPCC) highlight the fact that financing is a critical factor in the realization of sustainability (IPCC 2022). Hence, one of the required dimensions of the transformation process involves finding ways to ensure the availability of financial flows needed for sustainable investments. The financial means to pursue a sustainable transformation, however, are very unjustly distributed: while high-income countries have the capacity to create the money needed, middle- and low-income countries do not (Löscher and Kaltenbrunner

Handled by Paul Weaver, Maastricht University, UK.

✉ Nicolás Aguila
Nicolas.Aguila@uni-wh.de

Paula Haufe
Paula.Haufe@uni-wh.de

Joscha Wullweber
Joscha.Wullweber@uni-wh.de

¹ Politics/Political Economy, Transformation and Sustainability, Department of Politics, Philosophy, and Economics, Faculty of Management, Economics, and Society, University of Witten/Herdecke, Alfred-Herrhausen-Straße 50, 58448 Witten, Germany

² Politics/Political Economy, Transformation and Sustainability, Faculty of Management, Economics, and Society, University of Witten/Herdecke, Alfred-Herrhausen-Straße 50, 58448 Witten, Germany

2022). This state of affairs is particularly problematic considering that in general Global South countries contribute the least to worldwide carbon emissions while being the most affected by the adverse ecological and climate impacts thereof (Ghosh et al. 2022; Haag 2023). In particular, many of these countries are heavily exposed to losses from climate change-induced extreme weather events such as floods, droughts, and hurricanes, but also to other natural disasters (Perry 2021).

To date, Global North countries continue to lag far behind the annual 100 billion US dollar commitment for climate action in the Global South they made in 2009 at the 15th Conference of Parties (COP 15) (OECD 2022). Moreover, the UN recently called upon the Group of Twenty (G20) to increase affordable and long-term financing for sustainable development by at least 500 billion US dollars per year (United Nations 2023a). However, the actual financing need far exceeds that figure. The Grantham Research Institute on Climate Change and the Environment estimates that emerging and developing countries will need to spend an annual amount of around 1 trillion US dollars by 2025 and 2.4 trillion US dollars by 2030 to pursue investments crucial to limit global warming to the target of 1.5 degrees (Bhattacharya et al. 2022). The report issued by the Independent High-Level Expert Group on Climate Finance elaborates that such spending is especially needed across the following three areas: (1) transformation of the energy system, (2) strengthening the adaptation capacity and resilience of climate-vulnerable countries and (3) fostering sustainable agriculture and restoring natural capital and biodiversity damaged by human activity (Songwe et al. 2022).

In other words, the level of global finance has fallen far too short to effectively finance the required transformation (Attridge and Engen 2019). The vast majority of current funding (82%) stems from bilateral and multilateral public sources, while the scale of private finance compared with levels in 2019 is relatively low and decreasing (OECD 2022). Additionally, the cost of capital (the rate of return required by investors) is two to three times as large in the Global South as it is in the Global North (Persaud 2023). Recent research shows that for these reasons, foreign financial investors are unlikely to finance the green investments lacking in the Global South (Dafermos et al. 2021). This is the case, above all, because particularly in areas such as environmental conservation, restoration, and protection, many sustainable projects are inherently high risk with little or no profit potential (Kedward et al. 2020; Bolton and Kacperczyk 2021; Christophers 2022).

The shaping of global financial flows is a highly political matter. Money itself is a political construct permeated by unequal and hierarchical power relations, both on the national and international level (Weber 1978; Wullweber 2019). Considering how to create global financing

opportunities for sustainable transformation requires examining power relations inscribed in the global financial architecture (Wullweber 2015, 2016). The US dollar holds a central place in the current international monetary system. Located at the very top of the global currency pyramid, it is the unit of account in which most global trade and finance are denominated, and the currency which is used for reserve accumulation (Cohen and Benney 2014; Kaltenbrunner and Lysandrou 2017; Gopinath et al. 2020). Most importantly in the context of this paper, the U.S. dollar is the medium of payment in which international balances are settled. Accordingly, one of the largest hurdles to financing sustainable and just transformation is the need on the part of Global South countries to acquire US dollars to import and pay for the goods, services, and technologies they require but do not (yet) produce for the sustainable transformation (Löscher and Kaltenbrunner 2022). Although the ultimate aim of transformation processes is certainly to strengthen local production and markets, the import of certain goods and services is unavoidable, and will likely remain so, at least for some time to come. To move towards renewable energy sources, for example, countries need to import solar panels, wind turbines, and other commodities that they do not yet have the capacity to produce themselves.

Most Global South countries, however, either lack dollar reserves or cannot obtain the amount they need because they do not have sufficient trade surpluses. Access to foreign currency credit is either not an option or very expensive, and many of these countries are already highly indebted. As a result, proposals to provide finance to the Global South will continue to fall short in ambition unless a new, non-hierarchical international monetary system is created in accordance with the principles of global justice. Accordingly, to overcome one of the largest problems in terms of financing sustainable transformation, we propose the establishment of a new international monetary system: A Green Bretton Woods system,¹ based on a new special purpose money that would operate on a global scale. Building on and expanding Keynes' idea for an international clearing union (ICU), the Green Bretton Woods System would include a Green World Central Bank (GWCB). The GWCB would be allowed to create its own unit of account: the ecor—a supranational special purpose currency similar to

¹ We use the reference to Bretton Woods to indicate the possibility of an international monetary system arising as a result of international coordination that achieved a certain level of financial stability. However, we acknowledge that the historical founding process excluded many countries of the Global South. Moreover, as we show in the following, the system that came about as the outcome of those negotiations is based on the US dollar, which already constitutes an inherent impediment to sustainable development. Finally, our concept is not in any way intended to replicate or supersede the currently remaining Bretton Woods institutions, the World Bank, or the International Monetary Fund.

the one Keynes called 'bancor'. It would only be credited to and debited from the central banks of countries for the specific purpose of financing the sustainable transformation.

The GWCB would be able to expand its balance sheet, thereby creating money to finance sustainable projects throughout the world. The funds for such projects would not come from creditors but, as with any other central bank, would be created in the act of lending. This would allow for financial elasticity towards green projects, alleviating the financial constraints that exist under today's monetary regime. In this way, the amount of ecor in the system would adjust to the real demands for sustainable transformation and would not be limited by previous holdings of US dollars or any other currency. The system would accordingly make a decisive contribution to sustainable and just transformation by allowing countries, especially in the Global South, to finance necessary imports.

As our proposal specifically focuses on special purpose money, it is meant to supplement rather than supersede the current international monetary system. It could, however, be a first step in setting up the infrastructure required to completely overcome the current hierarchy, and to ultimately replace the current international monetary system with a more globally just system. During the transformation to a sustainable economy, the area of circulation of ecor would gradually expand and eventually displace the US dollar and other currently dominant currencies. Our proposal aligns with and extends proposals to reform the international monetary system that are currently being considered, above all, by the UN and the Bridgetown Initiative.

The remainder of the paper is organized as follows. In Sect. "[Money creation, power, and global hierarchies](#)", we explain how money creation works and how it is embedded in power relations, including at a world level. Sect. "[The limits of the dollar-centred international monetary system to financing sustainable and just transformation](#)" explores the limits of the current international monetary system to finance a sustainable and just transformation in the Global South. In Sect. "[Keynes' international clearing union and bancor proposal](#)", we discuss the main characteristics of Keynes' proposal for an international monetary system. Sect. "[Towards a Green Bretton Woods with the ecor at the centre](#)" details our proposal for the ecor within a Green Bretton Woods System. A concrete illustration of how the ecor would work is presented in Sect. "[The ecor in practice](#)", followed by concluding remarks in the final section.

Money creation, power, and global hierarchies

Before developing our approach to special purpose money, we consider it worthwhile and relevant to our topic to briefly explain how money creation works and why an

understanding of money creation is important for the overall discussion of local and global special purpose money and the challenges posed in that regard.

In today's world, the nation state proclaims a particular form of credit to be money, thus converting it into legal tender. While in principle any person can issue a promissory note with the hope that it will be accepted by another person, only commercial banks and nation states, mostly via their central banks, are allowed to issue generally and legally accepted promissory notes (money). Consequently, the system is the product of conflicts of interest and power struggles. The contemporary monetary system evolved from those struggles as a historical compromise that granted commercial banks the right to create money by issuing loans. When a commercial bank extends credit, the money involved does not stem from another bank account as many mainstream economics textbooks still explain. Banks are not intermediaries of existing deposits or funds (McLeay et al. 2014). Instead, when issuing a loan they create new money. This is possible because the money form constitutes an asset and, at the same time, a liability. In other words, money represents a credit relation (Mitchell-Innes 2004). The credit form issued by commercial banks is recognized by the state as a legal means of payment (Knapp 1924). More precisely: Via its central bank, a nation state guarantees that credit issued by commercial banks will be traded with central bank money at par on demand. Accordingly, commercial bank credit is treated as if it were state money. When commercial banks settle their payments among themselves, however, they have to resort to central bank money. In the hierarchy of money forms, central bank money is at the top, followed by credit issued by commercial banks (Bell 2001; Mehrling 2013). Other types of credit—especially credit forms originating in financial markets but also regionally created special purpose monies—are situated at the level below commercial bank money.

There are also hierarchical differences among central bank monies, depending on which country the central bank belongs to. As already stated, the US dollar occupies the highest level as the undisputed global currency (Mehrling 2015; Murau et al. 2022). The lower levels of the pyramid are occupied by the currencies of Global South countries. Particularly these countries face serious financial problems in achieving sustainable transformation. Although they can issue their own currency to finance green projects, they need US dollars, or other leading currencies, such as the euro or the pound, to import goods, services, and green technologies that they cannot or prefer not to produce on their own. Since many countries in the Global South are dependent on imports and are unable or insufficiently able to generate or earn the foreign currency necessary to finance the goods they need from abroad, they face a constant shortage of US dollars (Löscher and Kaltenbrunner 2022).

Important conclusions on the potentials and limits of special purpose monies can be drawn from this understanding of money. First, as money is a form of credit, there is no natural limit to the amount that can be created. In theory, any green project is fundable as long as necessary resources are available and the actors involved are willing to accept the special purpose money in question. Second, if there is a shortage of legal tender, whether for legal reasons (e.g. a constitutional debt brake), ideological reasons (e.g. the dogma of austerity), or political–economic reasons (e.g. danger of inflation, imposed structural adjustment programmes), special purpose money can offer an alternative to national currencies.

This is one reason why in recent decades several proposals for local or complementary currencies, including local exchange trading systems (LETS), time banks, currencies such as the Ithaca HOURS, and other convertible local currencies have been elaborated and put into practice with the aim of fostering sustainable agendas (Dittmer 2013). The objectives include (1) improving economic sustainability through the localization of production chains and the creation of alternative values, (2) fostering environmental sustainability through the reduced ecological footprint of localized production and consumption and (3) promoting social sustainability through community building, incentivizing neighbourly support, stimulating new networks of friendships, and fostering democratic participation (Seyfang and Longhurst 2013; Gerber 2015; Cabaña and Linares 2022).

In this respect, the introduction of special purpose money has promising potential for overcoming constraints to financing green projects. However, the implementation of such a money form faces several challenges (Dittmer 2013). Considering the restricted scope of their circulation, complementary local currencies are not designed to finance infrastructure projects on the massive scale required to achieve climate change adaptation and mitigation goals. Furthermore, local currencies face the problem of convertibility into legal tender. Accordingly, they are not able to satisfy an important part of the financing needed for sustainable transformation because they cannot be used to pay for imports such as green technologies. Local currencies also face the problem of how to ensure the stability of their value. The question, in other words, is how to gain sufficient trust in, and acceptance for, a special money form to convince the public to start using it with sustained confidence. Additionally, to supervise the creation of this money form there would have to be an appropriate security mechanism, a control system, and/or an oversight authority. To effectively advance sustainable transformation, the system in charge of creating any form of special purpose money would have to be vested with significant power. This raises the question of how to ensure state acceptance for the respective money form. All these considerations suggest the existence of serious limitations in the ability of local currencies to provide the kind of financing needed for

sustainable transformation. In this paper, we undertake to demonstrate that there is, however, a conceivable solution to developing a form of special purpose money capable of overcoming these problems. Before detailing the specifics of our proposal, we argue that, for a variety of reasons, the current international monetary system constitutes a key barrier to the financing of a sustainable and just transformation.

The limits of the dollar-centred international monetary system to financing sustainable and just transformation

Several authors suggest that the USA and countries with currencies such as the euro and the pound, which are close to the top of the global currency hierarchy, possess the capacity to create enough money to fund a sustainable transformation (Nersisyan and Wray 2019; Galvin 2020). These authors contend that countries with dominant currencies would simply have to break with the neoliberal corset that guides their policy-making. This is basically because they either produce key resources domestically or can import them, given that every participant in the international monetary system is willing to accept their currencies as means of payment. For this reason, these countries could issue a significant amount of new money, for example, to hire workers, buy means of production (regardless of whether they are produced locally or abroad), or green technologies, unless they face constraints such as inflation. This, however, does not imply the absence of problems, as the initial creation of money is not enough: credits must be put to productive use over time, financial stability must be preserved (among other things by avoiding a possible “green financial bubble”), and mechanisms must be developed to solve the problem of money destruction that comes with repayment of debt (Murau et al. 2023).

By contrast, countries whose currency is lower down on the global currency pyramid face significant challenges in financing sustainable transformation (Althouse and Svartzman 2022; Löscher and Kaltenbrunner 2022; UNCTAD 2019). Countries in the Global South do not have sufficient trade surpluses or dollar reserves, or do not have them in the amount required to pay for the imports needed for sustainable investment. Access to dollar-denominated credit is either not an option or too expensive, and many Global South countries are already highly indebted. One major hurdle in Global South countries is thus a lack of capital and the resulting contractionary effects on their economies, factors which are incompatible with sustainable development objectives. This problem is echoed by development scholars who point to the detrimental effects of external lending, capital outflows and debt crises (Eradze 2023). These effects have become stronger since the beginning of

neoliberal globalization in the 1970s (Chang 2008).² Furthermore, as Althouse and Svartzman (2022) argue, the currency hierarchy constraining the development of financially subordinated countries is intertwined with an ecological hierarchy: the need to acquire US dollars leads peripheral countries to specialize in low value-added natural resources and polluting activities, enabling core countries, in turn, to appropriate said resources with devastating socio-ecological consequences. This makes it clear that an all-encompassing global transformation towards sustainable development must be firmly based on the transformation of the global monetary and financial system.

Against this background, international political and financial organizations have advocated the mobilization of private finance towards sustainable objectives on a global scale (Bayliss and Van Waeyenberge 2018). This form of financing, however, has been variously criticized on the grounds that it lacks transparency and accountability (Bracking and Leffel 2021), and, most importantly, that the funds raised are insufficient in quantity and unjust in their consequences (Attridge and Engen 2019; Gabor 2021). Dafermos et al. (2021, p. 238) argue that the most prominent among the climate finance policies pursued will increase “financial vulnerability in the Global South while doing little to achieve climate-aligned development”. Further studies on energy transition financing in Senegal, South Africa, and Zambia find that it sidelines local ownership while deepening financial dependencies (Claar 2020; Haag 2023; Elsner et al. 2021).

The limits of existing models to finance sustainable transformation have led to a series of alternative proposals. To mobilize the necessary funding, suggestions have been made to grant debt relief to countries of the Global South (Volz et al. 2021), to provide them with additional external finance through instruments such as debt-for-nature or debt-for-climate swaps (Essers et al. 2021), climate reparations (Perry 2021), and partial FX guarantees (Persaud 2023), or to issue and distribute International Monetary Fund (IMF) Special Drawing Rights (SDRs) (Aglietta and Coudert 2019). Although such proposals would be a step towards improving financing conditions for the Global South, they do not challenge the hierarchical character of the international monetary system, the powerful position of top currencies, and the financial subordination that constrains peripheral countries. Consequently, they fall short of bringing about the changes needed to counter the climate crisis on a global

scale (Gallagher and Kozul-Wright 2022; Löscher and Kaltenbrunner 2022; Pettifor 2022; Svartzman and Althouse 2022).

The proposal by Aglietta and Coudert (2019) to bypass dollar dominance by moving towards a system based on IMF SDRs does, however, point to a number of possibilities that would enable this system to fund the process of sustainable transformation. Options include the setting up of a trust fund, the granting of SDR loans to development banks for carbon emission reduction pledged programmes, and the issuance of SDRs to capitalize a green fund for developing countries. While we agree on the need to move towards a more equitable system, we see the transfer of responsibility to the IMF as equally problematic, given that this international organization remains committed to austerity and its policy recommendations frequently run counter to ecological considerations (Mariotti 2022). In addition, the amount of liquidity in an SDR-based system increases exogenously rather than endogenously based on decisions made by the IMF board, and ultimately, therefore, by the creditor countries. The financial needs for a global sustainable transformation, however, require flexibility which can only be granted if credit creation responds endogenously, according to financing needs. Moreover, given that SDRs are allocated on the basis of country quotas, the bulk of funds issued would go to high-income economies. Finally, SDRs are often considered tantamount to a currency. This, however, is not the case. Countries must pay interest on SDRs. Even when interest rates are significantly below market interest rates, SDRs still function as a loan (Pforr et al. 2022).

For these reasons, an economic and financial order capable of effectively financing sustainable and just transformation on a worldwide basis must entail the redesign of the international monetary system in order to circumvent US dollar dominance. An important historical precedent for such a process was set by the discussions that took place in preparation for and during the Bretton Woods Conference in July 1944, where delegates from 44 countries met to shape the international monetary system. Our proposal builds on Keynes' plan for that conference, which specified the creation of an International Currency Union and a unit of account he called the 'bancor'. Key elements of Keynes' plan were rejected in favour of an alternate version drafted by Harry Dexter White (2019), which led, in particular, to the US dollar becoming the quasi-world currency. Keynes' version, however, offers important insights into how a green global monetary system could work. Before outlining our proposal, we will analyse specific aspects and implications of Keynes' proposal.

² In line with this understanding of the problems faced by countries of the Global South, we diverge from approaches that see the failure of domestic policies as the root cause of development failure. Explanations based on this reasoning deflect attention away from the problematic nature of neoliberal globalization (Chang 2008) which has reinforced the monetary hierarchy outlined above.

Keynes' international clearing union and bancor proposal

In the early 1940s, John Maynard Keynes developed a proposal for shaping the post-war international monetary system in a way that would avoid financial crises in the long run and balance global trade, thereby introducing an element of global justice into the system (Steil 2013). His idea involved the creation of an international clearing union (ICU) that would allow deficit countries to temporarily hold debit balances with surplus countries (Keynes 2019). According to his plan, both deficit and surplus countries would be members of the ICU, which would have its own unit of account: the bancor. Bancors were designed to exist only for the purpose of settling international balances between monetary authorities (central banks, for example) and not for private use between individuals, companies, or banks. All countries participating in the union were to have ICU accounts through which they could transfer bancors to one another so as to settle external balances. Membership in the union would likewise require countries to commit to accepting bancors as a means of payment. Accordingly, whenever one country incurred a deficit with another, the former would be debited with bancors from its account at the ICU and the latter would receive a corresponding bancor credit. This would automatically expand the system's bancor reserves. Implied in this arrangement is the assumption that the amount of money in the system would adjust endogenously to the real demands of trade and would not be exogenously determined by a pre-existing amount of money (Mehrling 2016). Viewed from a different angle, the arrangement was designed to give countries a certain amount of flexibility in financing their trade deficits while allowing them sufficient time to sort out their external accounts (Keynes 2019).

Under Keynes' proposal, credits or debits of participating countries would be booked with the ICU and not with other countries or the IMF. Accordingly, the creation of a debit to the account of a deficit country could be thought of as an overdraft (Skidelsky 2005; Costabile 2009). It would not occur at the expense of any other country because the account of the surplus country would be credited with the amount owed in bancors which the surplus country could then spend within the system. As one country's debit would equal another's credit, the net position of the ICU would not change as a result of an expansion or contraction of credit within the system. According to Keynes' plan, the maximum debit balance of a given country would not be allowed to exceed its quota, and the quota would be determined by a formula based on a set of variables including the sum of the country's exports and imports (Keynes 2019).

Keynes' proposal stipulated that the exchange rate of each country's currency would be fixed relative to the

bancor to avoid competitive devaluations that might trigger currency wars, but also provided that rates could be adjusted with the permission of the ICU governing board. The bancor, in turn, was envisaged to have a fixed (but adjustable) exchange rate with gold. Member countries would have to agree to purchase gold only at that price, but they would be permitted to buy and sell gold at will and without limit. Keynes reasoned that allowing countries to hold gold reserves and use them to settle their balances would make the system more attractive to those, such as the USA, with large stocks of gold stocks, as such countries presumably would not want to demonetize their gold holdings (Keynes 2019).

Keynes' plan also specifically dealt with the question of how countries would restore equilibrium in their balance of payments. It opposed a contractionary adjustment that would burden deficit countries by reducing their balance of payments deficit through the reduction of imports, the devaluation of their currency, and the adjustment of their fiscal and monetary policy. Instead, it required both debtor and creditor countries to make adjustments in order to establish equilibrium. The key reason for proposing symmetric adjustment stems from the fact that the sum of all surpluses equals the sum of all deficits. As a result, if the latter is considered a problem, then the former should be as well (Richardson 1985). According to Keynes, contractionary adjustment is detrimental not only for deficit countries but also for surplus countries since the reduction of imports by a deficit country leads to a reduction in world trade. In such a situation, surplus countries face a reduction in exports with negative consequences for their output and employment. To remedy this detriment, Keynes advocates a "socialization of trade", meaning the expansion of international trade to ensure that all economies produce at full employment (Clary 2017).

Keynes' model contains specific proposals for both deficit and surplus countries to make balance of payment adjustments. On the one hand, if the balances of deficit countries were to exceed a certain proportion of their quota, they would be charged an increasing interest rate. Beyond a certain threshold, they would be allowed to devalue their currency. In addition, they would be asked to post collateral and implement measures to reduce their deficit. Barring the effectiveness of these measures, they could eventually be declared in default. On the other hand, if the credit balances of surplus countries were to exceed a certain proportion of their quota, they would be asked to take steps to restore equilibrium, among other things, by appreciating their currencies, expanding domestic demand, and reducing import barriers. Through these corrective mechanisms, Keynes' proposal aims to restore equilibrium by incentivizing surplus countries to boost their spending. Adjustment in this sense is expansionary. When spending is increased, credit balances do not lie idle in the coffers of the surplus countries,

but are used to expand world trade for mutual benefit. Paul Davidson (1993) argues that there are three ways for surplus countries to spend their balances within the system: (1) by buying goods from deficit countries; (2) by investing in deficit countries; and/or (3) by providing aid to deficit countries. Keynes' plan, however, does not foresee a ceiling for credit balances that would prevent surplus countries from no longer accepting bancors, or force them to settle their trade balances in gold or another currency.

Kalecki and Schumacher (1943) criticized the notion of 'equilibrium' in Keynes' plan. They argued that there “is no merit in a general policy aiming at Current Account equilibrium for all countries, because different countries are at different stages of economic development, and a regular flow of investment from the more highly developed to the more backward regions of the world may redound to the benefit of all” (Kalecki and Schumacher 1943, p. 29). In their view, forcing adjustment could prove counterproductive. They held that surplus countries should be allowed to maintain as many reserves (in gold or bancors) as they wished and that countries needing imports for “reconstruction, readjustment, and industrialization” should be allowed to hold the deficits that they required. In particular, the authors proposed that the Keynes plan be complemented by attaching an international investment board to the ICU that could advance long term bancor loans to “industrializing countries” with the request that said loans be spent in other deficit countries.

Towards a Green Bretton Woods with the ecor at the centre

Times of crises, like the situation that prompted the founding of the Bretton Woods system after the Second World War, often lead to “critical conjunctures” (Eckersley 2021) that mark the politicization of structures that would otherwise seem almost impossible to change. Such a scenario may once again develop in the foreseeable future if the climate crisis continues to escalate. Already, we are witnessing growing political pressure to reform the current international monetary system, and as international organizations are becoming increasingly aware of the system's flaws, momentum for change is building. In June 2023, at the Paris Summit for a New Global Financing Pact, UN Secretary-General António Guterres characterized the global financial architecture as “outdated, dysfunctional, and unjust”. He called for “a new Bretton Woods moment—a moment for Governments to come together, re-examine and re-configure the global financial architecture for the twenty-first century”.³ This is also the goal of the Bridgetown Initiative for the Reform of the Global Financial Architecture launched in 2022 by

the Prime Minister of Barbados, Mia Mottley.⁴ In 2023, Guterres and Mottley convened a meeting that resulted in the Bridgetown Initiative 2.0, which includes among its action areas the provision of liquidity to developing countries, the transformation of the governance of international financial institutions, and a creation of an international trade system that supports global green and just transformations (United Nations 2023b). These initiatives are evidence of growing urgency in the debate over how to reform the international monetary system. What is still largely lacking, however, are concrete concepts for alternative forms of an internationally just monetary system conducive to the financing of the investments needed for sustainable transformation. The present paper aims to address this gap.

Wright (2011, 2017) makes the case for “real utopias” that are ideal in spirit, but very attentive to questions of practical feasibility and design. His works explore the possibilities of better futures, while remaining grounded pragmatically in the historical configuration of contemporary capitalism. Our proposal can be understood as part of the effort to “develop strategies that enable us to make empirically and theoretically sound arguments about emancipatory possibilities” (Wright 2011: 37, 2017). We build on Keynes' plan with the overarching aim to develop a supranational arrangement that would provide countries especially, but not only, from the Global South with the financial leeway they need to import green goods, services, and technologies essential to achieve the objectives of sustainable transformation. Towards this aim, we propose the creation of a Green World Central Bank (GWCB) embedded within a Green Bretton Woods System that could issue its own unit of account, which we call the ecor. The ecor would constitute a supranational special purpose unit of account inspired by Keynes' bancor, and created specifically for the purpose of financing the worldwide sustainable transformation. Under our proposal, all participating countries would have an account at the GWCB. The GWCB would create ecor through the act of lending by digitally crediting a country's GWCB account. The country would then transfer them to the GWCB account of another country to pay for the imports that it needs. This would alleviate financial constraints and provide the elasticity necessary to finance sustainable projects.

As discussed above, all forms of special purpose money face similar challenges: How can trust be created in the money form? How should its value be determined? How should the exchange with other currencies be managed? What steps need to be taken to ensure that the special purpose money is only used for its specified purpose, in the

³ <https://press.un.org/en/2023/sgsm21855.doc.htm>.

⁴ <https://pmo.gov.bb/wp-content/uploads/2022/10/The-2022-Bridgetown-Initiative.pdf>.

present case for sustainable projects? What mechanisms exist to make it possible for this form of money to emerge from its niche existence and develop a broad and sustainable impact?

Regarding the first question, trust in the ecor would be established via the Green World Central Bank (GWCB) and the Green Bretton Woods System. As more and more countries come to accept and use the system, trust in the ecor would grow. With growing participation in the system, the number of trade partners to buy from or sell would increase. Surplus countries in particular might be reluctant to join the Green Bretton Woods System if they were unable to find an attractive way to spend their credits. The larger the system were to become, however, the more possibilities there would be for surplus countries to use their ecor credits.

With respect to the second question, various possibilities are conceivable for determining the value of the ecor against other currencies. One ecor, for example, could be set to equal one US dollar or defined as equivalent to an IMF SDR. Another option would be to peg the ecor to a basket of currencies, or to track the evolution of the value of a basket of commodities. For simplicity's sake, we shall assume that one ecor equals one US dollar. This assumption will lend clarity to our discussion for two reasons: First, since dollars are the current unit of account for global trade and finance, defining ecor as equal to US dollars would bypass the inevitable redenomination problem involved in transferring commodity prices from US dollars into ecor. Second, because the exchange rates of all national currencies are quoted in terms of US dollars, their exchange rates to ecor would be readily available. However, we recognize that pegging the ecor to the US dollar would problematically imply the retention of the US dollar's privileged status, at least for the foreseeable future. Additionally, as exchange rates can potentially be overvalued or undervalued at any given point in time, they might not be the most expedient starting point for a system of fixed (even if potentially adjustable) exchange rates. Accordingly, while proceeding on this assumption is useful for capturing the essence of this proposal in simplified terms, it might not be desirable for the actual system.

The third question concerns the exchange of ecor with other currencies. Similar to the Bretton Woods System, the exchange rate of all national currencies would be fixed to the ecor but adjustable based on internationally agreed rules. This would avoid competitive devaluations that could trigger currency wars and culminate in the collapse of the system. Moreover, it would also prevent the overvaluation of a given country's currency which could lead to trade deficits and negatively impact local production. Closely following Keynes' proposal of one-way convertibility between the bancor and gold, and to obviate any possibility of a run on ecor, our proposal would not permit the conversion of ecor into US dollars or other national currencies. Nevertheless,

countries would be able to sell US dollars, or other currencies, to the Green World Central Bank in exchange for ecor. The one-way convertibility of U.S dollars to ecor is important because, similar to Keynes' vision that bancors would replace gold as the international reserve currency, the symmetric treatment of all currencies vis-à-vis the ecor would eventually lead to the gradual replacement of the US dollar, or any other key currency, in that role (Skidelsky 2005; Alessandrini and Fratianni 2009; Costabile 2009). Key currencies would lose much of their special status because the countries issuing them, just as any other country, would have to obtain ecor to settle their international imbalances, and because other countries would no longer need to hold US dollar reserves.

Regarding the special purpose issue posed in the fourth question, we propose a classical dual control method to be carried out by democratic institutions to ensure that ecor only be spent for sustainability projects. Similar processes are already in place, example given, whenever funds are requested from the EU or the World Bank. In order to acquire ecor for sustainable projects, actors such as local communities, mayors, governments or private investors would have to prepare an application for submission first to a national institution and then, after a positive evaluation, to the GWCB. The initial evaluation could be performed either by a new institution established for that purpose, or by an existing institution such as the ministry of economy or the central bank of the country where the investors are located. These institutions would have to build up corresponding competences internally. Projects failing to meet sustainability standards agreed upon by the members of the GWCB would not be funded. At the same time, the procedure would guarantee that funding would only be provided for projects with promising prospects, thus limiting the system's creation of credit to ideas with adequate repayment capacity, or to necessary, albeit unprofitable, investments. In this way, the system would avoid an uncontrolled creation of credit (both in ecor and national currencies) with destabilizing consequences. As is currently already the case with central banks, corresponding competences would have to be built up in the respective institutions. We are aware that conflicting definitions exist over what is or is not considered sustainable and what counts as "promising". However, all sustainable projects must struggle with this problem. In our opinion, it is important that the task of determining what qualifies as sustainable and promising should be delegated to democratic institutions and not to private investors. It would, of course, also be possible at this point to involve other security mechanisms and actors, such as a consortium comprised of representatives from civil society organizations and scientific institutions. Regardless of how the decision-making process is designed, care must be taken to ensure that actors with superior financial resources or opportunities to exert

influence through lobbying, for example, do not gain unfair advantage over competitors. Each member country would be allowed to define the institutional setting that best suits their interests. In the second step, however, after approval of the project, the national institution would have to apply to the GWCB for the required amount of ecor. This would constitute a second control point to ensure that ecor creation in the system would be limited to sustainable projects. During this phase, locally approved projects would be reviewed and validated by the GWCB to eliminate the risk of corruption or corporate capture of local governments.

Unlike the ICU in Keynes' proposal, the GWCB in our model would not extend credit to already finalized transactions, but would intervene prior to the transaction to decide whether or not to extend credit. In this sense, credit creation by the GWCB would resemble a productive loan rather than an overdraft as outlined in the ICU model. It follows that the GWCB would require a dynamic, qualified, and independent staff specialized in sustainability and creditworthiness analysis within a framework based on mutually agreed standards. Many national and international institutions, including development banks, the World Bank, the IMF, and the UN, among others, are already staffing their teams with highly skilled personnel specialized in these areas. In addition to professional expertise, the GWCB staff would need to be provided with the appropriate infrastructure to enable them to expedite credit applications and reach timely decisions while resisting pressure from national governments.

The answer to the final question—whether the ecor could succeed in leaving a niche existence—depends on the size and composition of the system's membership. If it were possible to establish a Green Bretton Woods System on a scale similar to the former Bretton Woods system, the ecor could become a global and widely used currency. Without a majority of the world's countries integrated in the scheme, the degree to which the ecor could prevail would largely depend on the status and number of participant countries. The system would be capable of working as long as enough countries came to accept ecor as payment for their exports. As the sum of surpluses equals the sum of deficits, if there were few surplus countries, the system would remain small, as total deficits would be limited to the willingness of the few financiers to finance them. Theoretically, the system we propose could be launched already by just two states. In practice, however, we assume that a significantly larger number of participating states would be required to constitute a critical mass. A more even proportion between surplus and deficit countries would allow the system to accommodate larger balances and therefore enhance its capacity to grow. This is not to say that a perfect balance between high- and low-income countries would be required. An agreement could also be concluded among mostly low-income countries, making it possible to increase green demand in the

Global South, which in turn would promote sustainable transformation. Arrangements of this nature are not uncommon. Several countries, including Bolivia, are already using the Chinese renminbi (RMB) to settle their cross-border trade. RMB transactions are increasing on the world stage even where China is not a trading partner – in the case of Argentina, for example, which uses RMB to repay IMF loans. Countries such as Argentina and Brazil also use their local currencies on a bilateral basis, and multilateral systems such as MERCOSUR, the Mercado Común del Sur (Southern Common Market) (Fritz et al. 2023), are gaining in importance. Although arrangements of this nature fall short of a more egalitarian international monetary system as we envisage it, they do show that various processes already underway are taking initial steps to circumvent the existing financial architecture. A coalition of these processes and countries with initiatives such as the UN-backed Bridgetown 2.0 would constitute a political moment towards a more just and sustainable financial architecture.

The ecor in practice

The following example is provided to demonstrate how our proposal could be operationalized in practice. As previously mentioned, one of the key problems of financially subordinated countries is the lack of US dollars necessary to acquire the means of production and green technologies essential for achieving a sustainable transformation. For the sake of illustration, we assume that local initiatives in Bolivia are planning to carry out a green project (for example, a housing development with solar panels). They present the proposal to the Bolivian central bank. This first step is important as it serves as an initial filter to guarantee that ecor would actually be used for green purposes.

Local means of production and workers are to be employed in the implementation of the project, but other goods, services, and technologies need to be imported. By creating money, the Bolivian Central Bank can finance the purchase of goods paid for in national currency, but imports such as solar panels have to be settled with international means of payment. Estimating that Bolivian local initiatives would need 1 million ecor to purchase solar panels, the Bolivian Central Bank would have to request that amount from the GWCB. Let us assume that the GWCB approves the project and creates a 1 million ecor debit (deposit) and credit (loan) to the account of the Bolivian Central Bank.⁵ Once the ecor loan is granted, the Bolivian Central Bank would authorize the imports required by the local initiatives and would grant them a local currency equivalent loan

⁵ In the interest of simplicity, we shall assume a zero interest rate.

(interest free, or with very low interest), which at a rate of 7 bolivianos to 1 ecor, would equal 7 million bolivianos. The local initiatives would then be authorized to buy solar panels worth 1 million ecors from, for example, a Chinese producer and would transfer the national currency equivalent (7 million bolivianos) to the Bolivian Central Bank. The latter would then transfer 1 million ecors from its account at the GWCB to the GWCB account of the People's Bank of China (PBoC). Once its GWCB account is credited accordingly, the PBoC would issue the national currency equivalent (650 renminbi at a 6.5 exchange rate) and transfer the amount to the solar panel producer.

In the end, the Bolivian local initiatives receive the imported goods. They owe the Bolivian Central Bank bolivianos in the amount of their loan. The Bolivian Central Bank, in turn, owes the GWCB said amount in ecors. The Chinese government receives an ecor deposit at the GWCB, and the Chinese exporter receives renminbi in exchange for the goods it has sold to the Bolivian investors. In this way, local sustainability initiatives that cannot buy solar panels under the prevailing system because they cannot raise 1 million US dollars would be able to effectively drive Bolivia's transformation towards reduced greenhouse emissions. Symmetrically, Chinese producers would benefit because they would now be able to sell solar panels that otherwise they would not have sold. The only necessary assumption is that they would be willing to accept local currency instead of dollars. However, this assumption does not seem problematic as a significant part of their expenditures are made in local currency. For their imports, however, they could ask their central bank for ecors. In this way, the ecor system would not only be attractive for deficit countries but also for surplus countries, as it would provide them with a way to increase the demand for their products.

As in the case of bancors, ecors would only be able to be spent within the system. It would not be possible, for instance, to use ecors to buy something in a grocery shop. The currency would constitute Green World Central Bank money to be used exclusively in transactions between central banks. In our example, the PBoC would then have a credit in the amount of 1 million ecors which it could use in a number of different ways. First, the bank could hold them as reserves. Incentives to keep reserves, however, would not exist, considering that countries would be able to procure new credits to finance imports and would not have to protect their exchange rates against runs. Second, the ecor credits could be used to buy green goods or services from other countries. As there are no incentives in our example for the PBoC to hold ecors, the central bank could make them available to Chinese residents with an interest in purchasing sustainable products abroad. The spending of ecors by surplus countries in deficit countries would expand green demand there, leading to the creation of jobs designed to

promote sustainable transformation, which, in turn, would provide the deficit countries with the ecors they need to cancel their ecor debits. As this would be an ideal solution from an internationally just perspective, strong incentives would be required for its realization. Such incentives would have to be agreed upon internationally, but, as in the Keynes proposal, one potential option would be to impose interest rates on the balances of both creditors and debtors above a certain threshold. Third, surplus countries such as China in our example could invest the money in deficit countries. This would promote additional green demand and the creation of green employment as well as ecor credits. The fourth option for surplus countries in general, including China in our example, would be to simply forgive the debt and transfer their ecor credits to the deficit country as a form of aid. Since this option does not require funds that would otherwise not be available for domestic spending, as in the case of foreign aid financed from the national budget, it is also an attractive option for exporting countries.

Considering Kalecki and Schumacher's (1943) critique of Keynes' model, and assuming that the sustainable transformation will be a gradual and time-consuming process, the design of the system should take into account the fact that in some countries transformation is likely to be a lengthy process involving significant deficits, while in others there will be sustained periods of surplus. This should not be a problem since ultimately all countries will benefit from climate change mitigation and adaptation, not least because of its money-saving potential. For the system to work in the long run, however, countries in need of funds in the short term would eventually have to reverse their foreign trade position to repay their debts. This, in turn, implies that the productive structure of deficit countries would have to become competitive enough so as to be able to export and earn the ecors needed for repayment. In options two through four above, this would be achieved by an international increase in demand, leading to an expansionary adjustment of imbalances. In order to avoid replication through the system of existing patterns of ecologically unequal exchange, mechanisms would be required to encourage surplus country spending on sustainable activities. This means that some of the projects financed by the GWCB would have to be geared towards activities with good export prospects. However, this would not necessarily apply to every approved project. In fact, spending would be desirable not only for non-competitive or non-tradable activities, but also for non-profit projects, including, for instance, efforts directed at mitigating the costs of loss and damage due to climate change. To be able to conduct projects of this nature, a deficit country would either have to develop highly competitive export sectors so as to attract ecors in sufficient amounts to cover all of its debts, or it would have to count on aid from surplus countries or their willingness to finance unprofitable

projects. In this way, the system would contribute to addressing the fundamental productive and ecological imbalances that characterize the current state of world trade (Svartzman and Althouse 2022).

Conclusion

At the international Summit held in Paris in June 2023 around the theme “Building a new consensus for a more inclusive international financial system”, Mia Mottley, Prime Minister of Barbados, argued the need for “a more responsive, fairer and more inclusive international financial system to fight inequalities, finance the climate transition, and bring us closer to achieving the Sustainable Development Goals.”⁶ As shown in the paper, the political process to establish a new, more just, and sustainable global financial architecture is well underway. We maintain, however, that current approaches fall short in financing worldwide sustainable transformation. First, the significance and constraints of the global monetary hierarchy are underestimated. As long as this hierarchy holds, the countries of the Global South will remain dependent on the Global North and will not be able to generate funds at the level required for achieving sustainable transformation. Second, current approaches are based primarily on the mobilization of private funds. Private investors, however, are risk averse and, above all, profit oriented. Most of the investments needed to drive sustainable transformation cannot be financed with such funds. Third, existing approaches lack endogenous financial elasticity. This implies that funding is contingent on the goodwill of private investors or wealthy countries which always face domestic political pressure to invest their budgets internally. As a result, financial resources are always scarce. A Green World Central Bank with the ecor as its own unit of account would be able to use its balance sheets to finance the transformation. This would provide the elasticity necessary to adapt to the real needs of the transformation. Lastly, the proposed Green Bretton Woods System would facilitate democratization of the global financial architecture, thereby making the sustainable transformation more comprehensive and inclusive. Accordingly, we argued the need to rethink the overall international monetary structure. A Green Bretton Woods System with a Green World Central Bank and a supranational currency, the ecor, at its core would constitute a strong force with the potential of promoting sustainable and just transformation on a global scale.

Our example above demonstrates how the Green Bretton Woods System would make it possible for countries of the Global South to move towards sustainable investments

and create green jobs, thus rendering their economies more sustainable. It introduces an enabling structure capable of overcoming current constraints on financing climate change adaptation, and mitigation, while reducing loss and damage and driving the global transition towards zero greenhouse gas emissions (Svartzman and Althouse 2022). As we argue, without such a system, shortages of hard currencies such as the US dollar make necessary investments impossible. Furthermore, we describe how the proposal would allow producers of green goods and services to secure additional sources of demand which would also benefit their domestic economies. Accordingly, the ecor system would benefit not only deficit, but also surplus countries.

The example illustrates how a Global South country could procure an interest-free loan in foreign currency. The functionality of the system does not necessarily depend on a zero interest rate, but interest rates would definitely have to be kept low (Aguila and Wullweber 2024). Because ecor would not be convertible into US dollars or any other currency, they would only be valid within the system. This would eliminate any risk of a run on the GWBC. At the same time, it would incentivize surplus countries to spend their accumulated balances in other countries, creating further demand and positive loopback effects. In the system we propose, projects would need to be approved by both the national government and the GWCB. Therefore, only those meeting the internationally agreed sustainable standards would have access to funding. This would ensure a built-in limit to the quantitative expansion of ecor. More importantly, the Green Bretton Woods System would give deficit countries more autonomy to actively advance their national endeavours towards sustainable transformation without relying on the benevolence of international donors, conditional loans from international financial institutions, or private, profit-motivated financial institutions. This would contribute to the development of Southern sovereignty, allowing Global South countries to shape their own transformation.

There is no doubt that in the coming years, the increasingly catastrophic effects of the climate crisis will intensify the political debate on how to change the current financial architecture. We are already seeing calls for change from both the United Nations (as evidenced, e.g. by the Bridgetown Initiative) as well as from countries seeking to circumvent US dollar dominance. Power struggles over a multitude of conflicting interests will certainly pose a major challenge to the transformation process. However, the possibilities for real change are bound to increase as there is growing recognition in society and among policymakers of the inadequacy of the current international monetary system to facilitate the kind of sustainable transformation needed to prevent the world from becoming uninhabitable.

⁶ See <https://nouveaupactefinancier.org/en.php>.

Author contributions All authors contributed to the study conception and design. All authors contributed to writing the first draft of the manuscript and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding Open Access funding enabled and organized by Projekt DEAL. The research was funded by the German Research Foundation (DFG) under the Heisenberg Professorship Programme, reference WU 780/2-1, and the German Federal Ministry of Education and Research (BMBF) under the programme “Climate Protection & Finance (KlimFi)”, reference 01LA2207A.

Data availability Not applicable.

Code availability Not applicable.

Declarations

Conflict of interest The authors declare that they have no known competing interests that could have appeared to influence the work reported in this paper.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article’s Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article’s Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Aglietta M, Coudert V (2019) The dollar and the transition to sustainable development: from key currency to multilateralism. Policy Brief CEPII 26
- Aguila N, Wullweber J (2024) Greener and cheaper: green monetary policy in the era of inflation and high interest rates. *Euroasian Econ Rev*. <https://doi.org/10.1007/s40822-024-00266-y>
- Alessandrini P, Fratianni M (2009) Resurrecting Keynes to stabilize the international monetary system. *Open Econ Rev* 20:339–358
- Althouse J, Svartzman R (2022) Bringing subordinated financialisation down to earth: the political ecology of finance-dominated capitalism. *Camb J Econ* 46:679–702
- Attridge S, Engen L (2019) Blended finance in the poorest countries: the need for a better approach. Overseas Development Institute, London. <http://hdl.handle.net/10419/206745>
- Bayliss K, Van Waeyenberge E (2018) Unpacking the public private partnership revival. *J Dev Stud* 54:577–593
- Bell S (2001) The role of the state and the hierarchy of money. *Camb J Econ* 25:149–163
- Bhattacharya A, Dooley M, Kharas H, Taylor C (2022) Financing a big investment push in emerging markets and developing economies for sustainable, resilient and inclusive recovery and growth. Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science, London, Brookings Institution, Washington, DC
- Bolton P, Kacperczyk M (2021) Do investors care about carbon risk? *J Financ Econ* 142:517–549
- Bracking S, Leffel B (2021) Climate finance governance: fit for purpose? *Wiley Interdiscip Rev Clim Change* 12:1–18
- Cabaña G, Linares J (2022) Decolonising money: learning from collective struggles for self-determination. *Sustain Sci* 17:1159–1179
- Chang, HJ (2008) The Lexus and the Olive Tree revisited. Myth and facts about globalisation. In: *Bad Samaritans. The myth of free trade and the secret history of capitalism*. Bloomsbury Press, New York, pp 19–39
- Christophers B (2022) Fossilised capital: price and profit in the energy transition. *New Polit Econ* 27:146–159
- Claar S (2020) Green finance and transnational capitalist classes: tracing vested capital interests in renewable energy investment in South Africa. *J Entwickl* 37:110–128
- Clary BJ (2017) Keynes, the socialisation of trade, and international monetary institutions. *Eur J Hist Econ Thought* 24:979–997
- Cohen B, Benney TM (2014) What does the international currency system really look like? *Rev Int Polit Econ* 21:1017–1041
- Costabile L (2009) Current global imbalances and the Keynes Plan. A Keynesian approach for reforming the international monetary system. *Struct Chang Econ Dyn* 20:79–89
- Dafermos Y, Gabor D, Michell J (2021) The Wall Street Consensus in pandemic times: what does it mean for climate-aligned development? *Can J Dev Stud* 42:238–251
- Davidson P (1993) Reforming the world’s money. *J Post Keynesian Econ* 15:153–179
- Dittmer K (2013) Local currencies for purposive degrowth? A quality check of some proposals for changing money-as-usual. *J Clean Prod* 54:3–13
- Eckersley R (2021) Greening states and societies: from transitions to great transformations. *Environ Polit* 30:245–265
- Elsner C, Neumann M, Müller F, Claar S (2021) Room for money or manoeuvre? How green financialization and de-risking shape Zambia’s renewable energy transition. *Can J Dev Stud* 43:276–295
- Eradze I (2023) Unravelling the persistence of dollarization. The case of Georgia. Routledge, Oxfordshire
- Essers D, Cassimon D, Prowse M (2021) Debt-for-climate swaps: killing two birds with one stone? *Glob Environ Chang* 71:102407
- Fritz B, Kaltenbrunner A, Mühlich L, Orsi B (2023) South-South monetary regionalism: a case of productive incoherence? *New Polit Econ* 28:818–831
- Gabor D (2021) The wall street consensus. *Dev Chang* 42:429–459
- Gallagher K, Kozul-Wright R (2022) The case for a new bretton woods. Polity, Cambridge
- Galvin R (2020) Yes, there is enough money to decarbonize the economies of high-income countries justly and sustainably. *Energy Res Soc Sci* 70:101739
- Gerber J (2015) An overview of local credit systems and their implications for post-growth. *Sustain Sci* 10:413–423
- Ghosh J, Chakraborty S, Das D (2022) Climate imperialism in the twenty-first century. *Mon Rev* 74:1–17
- Gopinath G, Boz E, Casas C, Díez FJ, Gourinchas PO, Plagborg-Møller M (2020) Dominant currency paradigm. *Am Econ Rev* 110:677–719
- Haag S (2023) Old colonial power in new green financing instruments. Approaching financial subordination from the perspective of racial capitalism in renewable energy finance in Senegal. *Geoforum* 145:103641
- IPCC (2022) Mitigation of Climate Change. https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_FinalDraft_FullReport.pdf
- Kalecki M, Schumacher EF (1943) New plans for international trade: international clearing and long-term lending. *Bull Oxf Univ Inst Econ Stat* 5:29–32

- Kaltenbrunner A, Lysandrou P (2017) The US Dollar's continuing hegemony as an international currency: a double-matrix analysis. *Dev Chang* 48:663–691
- Kedward K, Ryan-Collins J, Chenet H (2020) Managing nature-related financial risks: a precautionary policy approach for central banks and financial supervisors. UCL IIPP Working Paper 9
- Keynes JM (2019) The Keynes Plan. Proposals for an international clearing union. In: Lamoreaux N, Shapiro I (eds) *Bretton Woods Agreements. Together with scholarly commentaries and essential historical documents*. Yale University Press, New Haven
- Knapp GF (1924) [1905] *The state theory of money*. Macmillan & Company Ltd, London
- Löscher A, Kaltenbrunner A (2022) Climate change and macroeconomic policy space in developing and emerging economies. *J Post Keynes Econ* 1:113–141
- Mariotti C (2022) Special Drawing Rights. Can the IMF's reserve currency become a transformative financial resource? Briefing Paper Eurodad, April. https://www.eurodad.org/sdr_transformative_resource.
- McLeay M, Radia A, Ryland T (2014) Money creation in the modern economy. *Bank Engl Q Bull* 54:14–27
- Mehrling P (2013) The inherent hierarchy of money. In: Taylor L, Rezaei A, Michl T (eds) *Social fairness and economics. Economic essays in the spirit of Duncan Foley*. Routledge, Oxfordshire, pp 394–404
- Mehrling P (2015) Elasticity and discipline in the global swap network. *Int J Polit Econ* 44:311–324
- Mehrling P (2016) Beyond bancor. *Challenge* 59:22–34
- Mitchell-Innes A (2004) The credit theory of money. In: Wray R (ed) *Credit and state theories of money. The contributions of A. Mitchell Innes*. Edward Elgar, Cheltenham, pp 50–78
- Murau S, Pape F, Pffor T (2022) International monetary hierarchy through emergency US-dollar liquidity: a key currency approach. *Compet Chang* 27:495–515
- Murau S, Haas A, Guter-sandu A (2023) Monetary architecture and the green transition. *Environ Plan A Econ Space*. <https://doi.org/10.1177/0308518X231197296>
- Nersisyan Y, Wray LR (2019) How to pay for the green new deal. *Levy Economics Institute Working Papers*, 971
- OECD (2022) Climate finance provided and mobilised by developed countries in 2016–2020: insights from disaggregated analysis, climate finance and the USD 100 Billion Goal. OECD Publishing, Paris. <https://doi.org/10.1787/286dae5d-en>
- Perry K (2021) The new 'bond-age', climate crisis and the case for climate reparations: Unpicking old/new colonialities of finance for development within the SDGs. *Geoforum* 126:361–371
- Persaud A (2023) Unblocking the green transformation in developing countries with a partial foreign exchange guarantee. *Climate Policy Initiative Working Paper*. <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/06/An-FX-Guarantee-Mechanism-for-the-Green-Transformation-in-Developing-Countries.pdf>
- Pettifor A (2022) Society must transform the international financial system in order to stabilise the ecosystem. In: Arestis P, Sawyer M (eds) *Economic policies for sustainability and resilience*. Palgrave Macmillan, London, pp 179–222
- Pffor T, Pape F, Murau S (2022) After the allocation: what role for the special drawing rights system? INET Working Paper, p 180
- Richardson DR (1985) On proposals for a clearing union. *J Post Keynes Econ* 8:14–27
- Seyfang G, Longhurst N (2013) Growing green money? Mapping community currencies for sustainable development. *Ecol Econ* 86:65–77
- Skidelsky R (2005) Keynes, globalisation and the bretton woods institutions in the light of changing ideas about markets. *World Econ* 6:15–30
- Songwe V, Stern N, Bhattacharya A (2022) Finance for climate action: scaling up investment for climate and development. Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science, London
- Steil B (2013) *The battle of Bretton Woods. John Maynard Keynes, Harry Dexter White, and the making of a new world order*. Princeton University Press, Princeton
- Svartzman R, Althouse J (2022) Greening the international monetary system? Not without addressing the political ecology of global imbalances. *Rev Int Polit Econ* 29:844–869
- UNCTAD (2019) *Trade and development report 2019: financing a global green new deal*
- United Nations (2023a) Inter-agency Task Force on Financing for Development, Financing for Sustainable Development Report 2023: Financing Sustainable Transformations. United Nations, New York. <https://developmentfinance.un.org/fsdr2023>
- United Nations (2023b) With clock ticking for the SDGs, UN Chief and Barbados Prime Minister call for urgent action to transform broken global financial system, Press Release. <https://www.un.org/sustainabledevelopment/blog/2023/04/press-release-with-clock-ticking-for-the-sdgs-un-chief-and-barbados-prime-minister-call-for-urgent-action-to-transform-broken-global-financial-system/>
- Volz U, Akhtar S, Gallagher KP, Griffith-Jones S, Haas J, Kraemer M (2021) Debt relief for a green and inclusive recovery: securing private-sector participation and creating policy space for sustainable development. Heinrich-Böll-Stiftung, SOAS, University of London, Boston University, June. [https://www.boell.de/sites/default/files/2021-06/DRGRReport 2021 Endf.pdf](https://www.boell.de/sites/default/files/2021-06/DRGRReport%2021%20Endf.pdf)
- Weber M (1978) *Economy and society*. University of California Press, Berkeley
- White H (2019) The White Plan. Preliminary draft outline of a proposal for an international stabilization fund of the United and associated Nations. In: Lamoreaux N, Shapiro I (eds) *Bretton Woods agreements. Together with scholarly commentaries and essential historical documents*. Yale University Press, New Haven
- Wright EO (2011) *Real Utopias*. Contexts 10:36–42
- Wright EO (2017) *Reale Utopien. Wege Aus dem Kapitalismus*. Suhrkamp, Berlin
- Wullweber J (2015) Post-positivist political theory. In: Gibbons MT (ed) *The encyclopedia of political thought*. Wiley, Chichester, pp 2932–2942
- Wullweber J (2016) Performative global finance: bridging micro and macro approaches with a stratified perspective. *New Polit Econ* 21:305–321
- Wullweber J (2019) Money, state, hegemony. A political ontology of money. *New Polit Sci* 41:313–328

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.