What policy mix for the ecological transition?

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Abstract

This article looks at how to make fiscal, monetary and prudential policies greener in order to address the massive financing needs and major risks associated with climate change.

Starting with the observation, based on the recent experience of the financial and health crises, that the separate and independent implementation of monetary and fiscal policies undermines their effectiveness, this study also shows the need for, and strategic role of, a green policy mix that ensures the coordination of fiscal, monetary, and prudential policies to meet the challenges of climate change.

Key Words: fiscal policy, monetary policy, prudential policy, ecological transition, green policy mix

Introduction

Climate change, fueled by the intensive use of fossil fuels, starting with oil and coal, is increasing at a faster pace than the Intergovernmental Panel on Climate Change (IPCC) initially estimated. It poses a serious threat to the various aspects of economic and social life. Its macroeconomic impact is six times greater than previously documented, resulting in a 31% decline in wellbeing in current values and a social cost of carbon (SCC) of $1,056 per ton of carbon dioxide (tCO2) (Bilal and Känzig 2024). The capitalist system is caught in a profound internal contradiction: it has been weakened by the financialization and over-exploitation of the planet and the fossil energy resources on which capitalism is based, but whose ecological and social limits have been largely reached, leading to the current financial and ecological crisis (Bonneuil and Fressoz 2013). Overcoming this crisis requires recreating a mode of development capable of meeting human needs while preserving the planet. A particularly strategic issue is the question of how to finance the energy transition.

According to a report by the International Energy Agency (IEA 2021), total annual capital investment in the energy sector alone under the Net Zero Emissions (NZE) plan will increase from approximately 2.5% of global GDP in recent years to around 4.5% in 2030. The scale of the resources and means that need to be marshaled is such that it is urgent and essential to design a monetary and fiscal policy consistent with the imperatives of the ecological reorientation and coordinated within the framework of a revamped policy mix (Jeffers and Plihon 2022).

In the wake of the 2007 financial crisis, central banks cut interest rates and implemented “unconventional” monetary policies, whose impact on activity and employment was limited, not least because they did not target key priority ecological and social goals. With the acceleration of inflation due to geostrategic tensions, central banks began sharply raising interest rates in 2021, helping trigger failures of a number of banks internationally in March 2023 and contributing to the reduction of the investments required for the ecological transition (Harribey et al. 2023). These limited impacts and the conflicting goals of monetary policy underscore the need to ensure the coherence of all economic policy instruments, beginning with fiscal and monetary policies. That calls for institutionalized coordination of fiscal, monetary, and prudential policies as part of a “green policy mix”, as suggested by the authors of “The green swan” (Bolton et al. 2020).

Following the financial, health, and climate crises, the current situation has brought the debate on the respective roles of monetary policy and fiscal and budgetary policy back to the

fore. This article successively examines avenues for (1) adapting and coordinating fiscal and budgetary policy and (2) monetary policy within (3) the framework of a green policy mix in order to meet the challenge of the ecological transition.

1- Bringing fiscal policy into line with ecological goals

There is a consensus that the ecological transition requires profound changes in consumer and producer behavior, as well as adapting the production system and infrastructure.

The IPCC's sixth assessment report (IPCC 2022] and 2023) attests to increasing risks and persistent delays in meeting the climate change targets set by the Paris Agreement (2015), whose goal was to limit global warming to 1.5 degrees Celsius. On a global scale, CO2 emissions have continued to rise, although they were meant to have fallen 50% by 2050 in order to limit global warming to 1.5 degrees. For this reason, the IPCC now estimates that global warming will reach 1.5 degrees by the early 2030s. So private and public economic players have thus far been unable to meet the major challenges posed by climate change. The reasons for this are well known—the short-termism of private and public decision-makers, the risks and uncertainty associated with the climate crisis, the massive scale of the investments required, and the neoliberal dogma that limits public policy options (Bolton et al. 2020).

According to the literature, macroeconomic policies—fiscal, monetary and financial—play a strategic role in achieving transition goals and contributing to the fight against climate change (Krogstrup and Oman 2019). IMF economists see fiscal and budgetary policy as the main mechanism that should be leveraged. Implementing a “green budget”, which was raised at the 2017 One Planet Summit, is recognized internationally as a strategic policy approach to the challenge posed by the ecological transition.[1] Two main categories of instruments, considered complementary, are generally identified—carbon taxation and public subsidies on the one hand and public investment on the other.

1.1 - Greening taxation and public subsidies

According to the prevailing theoretical approach, which views global warming as a negative externality, carbon taxation is a Pigouvian tax designed to encourage players to change their behavior by integrating the negative effects of climate change into their economic calculations. This view is too narrow, because carbon taxation has two other important dimensions that cannot be ignored: first, it is a major source of funding for the government’s “green budget”; and secondly, carbon taxation has redistributive effects for taxpayers’ incomes.

In 2022, total environmental tax revenue in the EU amounted to €317.2 billion, representing 2% of the EU GDP and 4.8% of total EU government revenue from taxes and social contributions (European Commission 2024). There was a decline between 2021 and 2022, primarily due to a decrease in energy tax revenues (€243 billion in 2022). Some countries, particularly in northern Europe, such as Denmark and the Netherlands, have higher environmental taxes, which generate much greater revenue, reaching almost 4% of GDP in the Netherlands. On the other hand, several non-European OECD countries, such as Canada, Australia, and the United States, have lower environmental tax revenues than Europe due to significantly lower energy taxes, particularly on fuel. In 2019, revenue from French environmental taxes was 2.32% of GDP, slightly lower than the European Union average of

2.36%. France is 18th out of 28 in Europe in the percentage of GDP that environmental taxes make up (Eurostat 2021).

Greening taxation should mean, first, increasing its average level to ensure the government's "green budget" is well financed, and secondly, reducing regressive effects, which are a source of increased inequality, in particular through compensation policies such as those implemented in France. One of the results of this "tax injustice" is that it undercuts the social acceptability of the carbon tax, as illustrated by the "yellow vest" movement that emerged in France in October 2018.

Government has two ways of offsetting the regressive effects of carbon taxes—one is government aid to encourage non-carbon activities or to help out the most vulnerable populations, which may take the form of spending in the form of tax exemptions. An example is the "price shield" implemented in 2021 to limit the rise in energy prices for consumers and small businesses. Another lever available to government consists of public guarantees, which are an instrument for reducing risk and protecting against uncertainty. By giving guarantees to companies and banks, government can act to ensure against the risks associated with global warming: physical risks, transition risks, and balance sheet risks.

1.2 – The importance of boosting public climate investment

Public investment is the second strategic component of budgetary climate policy. It is essential in order to complement taxation and public subsidies—because subsidies and tax incentives to encourage economic players to switch to low-carbon modes of transportation will be effective only if public authorities first encourage investments in alternative forms of transportation.

To make progress in the fight against climate change, massive public and private investment is also needed to ensure the development of renewable energies, infrastructure, and the transformation of the productive apparatus. Two obstacles, which have already been mentioned, discourage businesses from making these investments, thus requiring government intervention—first, these investments are mainly long-term and extend beyond the usual corporate time horizon; secondly, there is no guarantee they will be profitable, especially because of the new risks linked to the climate crisis.

The Institute for Climate Economics (I4CE 2024) compared 2022 investment levels with the levels of investment needed each year to meet the EU's 2030 targets in 22 sectors. The average annual investment requirement is estimated to be a minimum €813 billion, or 5.1% of EU GDP. Current levels of public and private investment represent just half of the total investment needed each year to meet the EU's 2030 targets for the energy, buildings, and transportation sectors. It is essential to double these investments to achieve the climate targets to which EU countries have committed.

1.3 – The question of financing the government's "green budget"

One of the challenges facing governments today in promoting the "ecological shift" is financing. Recent crises, and especially the health crisis, have led to sharply rising government deficits and debts, leading the proponents of financial orthodoxy to consider that governments' financial latitude is now limited (Arthuis 2021), and that central banks must practice the opposite of quantitative easing, i.e. quantitative tightening. Hence the rise in

interest rates, part of the tightening of monetary policy from 2021 onwards in response to accelerating inflation, which has reduced this latitude.

In fact, there are several complementary tools available to public authorities as part of the "green policy mix" based on the combination of fiscal, prudential, and monetary policies.

First, ecological taxation could generate substantial additional tax revenues. In France, where its current level is low, it could generate at least an extra 25 billion euros each year if it were raised to the level of the Netherlands, i.e. 3.6% of GDP. Green taxation could take different forms, such as the creation of a green wealth tax or the taxation of extra profits made because of higher energy prices and accelerating inflation (price-profit spiral).

Secondly, substantial savings could be made by eliminating public subsidies that continue to favor the production and use of fossil fuels, which would make it possible to redeploy those funds to boost renewable energies and help out the populations that are the most vulnerable to energy price increases. Public spending that is detrimental to the climate and the environment, as well as the billions of euros granted to companies without any climate conditionality, in addition to state guarantees, in particular for hydrocarbon projects abroad, represent billions of euros that are being lost for the financing of the ecological transition.

Third, we need to mobilize public financial intermediaries, who are strategic players in financing the transition. This concerns the European Investment Bank (EIB) at the European Union level and Bpifrance, which claim the mantle of climate banks. However, these banks' climate financing operations are limited by insufficient public funding and, above all, by the limits imposed both on their ability to finance their operations through credit and monetary creation, as do commercial banks, and to obtain funding from the ECB, even though the ECB's status makes that possible under Article 123.2 of the Treaty on the Functioning of the European Union (Grandjean and Dufrêne 2020).
It is thus clear that separating fiscal and monetary policy is not compatible with the imperatives of the ecological transition. The central bank is naturally involved in public debt management and there is also an intrinsic relationship between public finances, financing, and monetary issuance. Rules governing fiscal and monetary policy therefore need to be adapted in order to put together a policy mix capable of meeting the challenges and stakes of our time, those of the fight against climate change and for an ecological and social transition.

2 - Redefining monetary policy to meet the climate challenge

An initial step was successfully taken in July 2021 when the ECB announced, as part of its strategic review, that it would integrate climate considerations into its macroeconomic projection models and methods. In July 2022, the central bank decided to take a further step by declaring that, beginning in October 2022, all its new asset purchases from multinational corporations would be subject to environmental criteria. The ECB is now at a crossroads concerning the greening of monetary policy (Jeffers and Plihon 2022).

2.1 - The limits of monetary policy revealed by recent crises

In the wake of the 2007 crisis, the ECB was forced to abandon the principle of separating the goals of monetary stability and financial stability (Betbèze et al. 2011). Not only did financial instability drive central banks to come to the rescue of banks, but the significant risk of

deflation[2] in the eurozone forced the ECB at the time to focus on economic activity and employment as well (Jeffers and Goldman 2021). Central banks subsequently adjusted their monetary policy instruments and turned to unconventional policies. The ECB introduced four unconventional instruments: negative interest rates, forward guidance, the provision of liquidity to banks under TLTRO (Targeted longer-term refinancing operations), and finally the purchasing of securities under programs set up beginning in 2015. Trillions of euros were thus injected through quantitative easing. But this liquidity did not increase business or household access to credit. Worse still, the ECB's private debt buybacks contributed to funding companies working in sectors that emit the most greenhouse gases.

In addition to the principle of separating monetary and financial stability policies, the principle of the neutrality of monetary policy in relation to the markets, based on the assumption that financial markets are efficient, which reality has disproven, is now being challenged. This policy of neutrality is no longer tenable, as it runs so much counter to the goals of combating climate change by financing the companies that pollute the most (three-quarters of the bonds purchased by the ECB were issued by companies in the top half of greenhouse gas emitters). For this reason, the ECB announced in July 2022 that hence, "it will adjust the mechanism governing the allocation of securities purchases to take account of climate change criteria".
In general, monetary policies have failed to address the major challenges of the twenty-first century, i.e. climate change driven by the intensive use of fossil fuels, especially oil and coal. And yet banks have a strategic role to play here. This situation could lead to establishing a new monetary policy and to new changes in the doctrine of central banking, restoring central banks as "agents of economic development" (Epstein 2007), a role they have played before in their history (Jeffers and Plihon 2022). Consequently, a debate has opened up on how central banks can green their monetary policy, in both its conventional and unconventional dimensions (Boneva et al. 2021).

2.2 - Greening conventional monetary policy

Recent studies find that central banks can take action to green monetary policy without undermining traditional macroeconomic stabilization objectives (Kempf 2020; Bolton et al. 2018). They have the power to orient money creation so that it can take into account the major challenge of financing the ecological transition.

There are several mechanisms that can be harnessed within the framework of conventional monetary policy. The first is greening interest rates. This involves taking the main instrument of monetary policy, the policy interest rates set by central banks, and modulating them during central bank refinancing operations. For each bank, modulation would be based on the average climate risk of its portfolio. The procedure could involve assigning to each bank a composite climate rating, which would be used to calculate the climate risk premium to be applied by the central bank—applying differing interest rates for loans that aid a low-carbon transition (Harding 2021; Larsen 2022).

The central bank's interest rate policy also has a direct impact on the cost of government debt, and therefore on the financing of public investment. In the eurozone, after seven years of zero or negative money market interest rates, the ECB decided to follow the same road as other central banks and undertake a cycle of rate hikes. Between July 2022 and March 2023, six rate hikes (a cumulative increase of 350 basis points) were announced in response to accelerating inflation in the eurozone. This sharp increase was bound to cause bond prices to plummet and

have major consequences for both banks and the real economy. Such a sizeable and rapid rise in interest rates has the effect of slowing demand, both on the household side, where more expensive credit is coupled with lower real incomes, and on the corporate side, where it slows investment.

Climate and interest rates have a complex and ambivalent relationship. Climate-related risks end up affecting productivity and growth and having consequences for the long-term level of real interest rates (Brainard 2019); higher interest rates are also bound to have a bearing on the investments needed for the ecological transition. For this reason, these green investments should be financed at low, preferential rates. In any case, it seems essential to shield the financing of climate investments, whose strategic nature has been demonstrated, from the logic of the financial markets.

The second channel for greening conventional monetary policy concerns the collateral required by central banks as part of their refinancing operations. The refinancing conditions imposed on banks would be directly linked to the climate quality of collateral, in order to have them match low-carbon trajectories (green collateral) (Macaire and Naef 2022; McConnell et al. 2022). Central banks could apply additional haircuts related to the carbon intensity of the issuer (Dafermos et al. 2021; McConnell et al., 2022). Recent studies have shown that the greening of collateral eligibility criteria can have a significant impact on bank loan policies (Mésonnier et al. 2017).

2.3 - Greening unconventional monetary policy

Quantitative easing (QE) has been the most important form of unconventional policy. Greening QE would involve the central bank tailoring its portfolio of securities purchased under its asset purchase programs by taking into account their carbon footprint, in order to make it compatible with a low-carbon trajectory. This means that future asset purchases under quantitative easing should target green financial assets. Such “green quantitative easing” would create a large and stable demand for “low-carbon” bonds issued by companies or public development banks.

The investments required for the ecological transition are estimated to amount to 4 to 5% of GDP per year, or around €600 billion annually for the European Union over several decades. Banks have a vital role to play in financing climate investments by businesses and households. Moreover, as we have seen, the ecological transition will also require massive public investment. In this context, the role of central banks is crucial. Mario Draghi's “whatever it takes” statement in defense of the euro in 2012 demonstrated the power a central bank holds when it decides to firmly communicate its commitment and willingness to act. If necessary, it should therefore be able to use monetary creation to finance the public investments required for the ecological transition. An “ecological QE”, consisting of purchases or repurchases of securities, would make a significant contribution to speeding up green investment in infrastructure, housing, transportation, and renewable energies. Such an “ecological QE” would prohibit any future purchases by the ECB of bonds issued by carbon-intensive sectors. In this sense, it would actually be “qualitative easing” rather than “quantitative easing”.

Another example of the central bank's strategic role was provided by its action during the pandemic. The Covid-19 crisis, whose roots were partly economic and partly ecological, led to massive public spending that could not have been financed without central bank repurchases

of public securities. Several proposals have been put forward in favor of transposing the spending mechanisms required by the health crisis to financing the ecological transition. One possibility would be for central banks to cancel public debt tied to government ecological policies (*Le Monde*, 2021).[3] Another proposal is for the central bank to transform government debt associated with public investment for the ecological transition into perpetual debt, without repayment (Harribey et al. 2020).

Finally, all players in the banking system must be able to exercise their power to create money under the aegis of the central bank. Development and investment banks must be accorded a strategic role. They should be granted the status of monetary players in their own right and authorized to obtain refinancing from the central bank (Plihon and Rigot 2022).

2.4- A green prudential policy

Following the 2007 financial crisis, the role of central banks in prudential regulation increased. The primary function of prudential regulation concerns the stability of individual banks (microprudential) and the financial system (macroprudential). Insofar as climate change is generating new risks, it is essential that central banks and financial supervisory authorities ensure that climate-related risks be properly integrated into the risk management strategies and procedures of financial institutions. The recent studies by the international network of central banks and supervisors created in 2017 (Network for Greening the Financial System—NGFS), which comprises 114 central banks and supervisors, is devoted to adapting prudential regulation.

By taking into account the systemic risks generated by climate change, green prudential regulation can be an important instrument for averting climate change-related financial instability. Both before and after the signing of the Paris Agreement (2015), banks have accumulated hundreds of billions of dollars' worth of financial assets tied to the exploration, exploitation, transportation, and use of coal, oil, and gas. These fossil assets are in danger of becoming "stranded assets", i.e. of losing substantial value and becoming much less liquid (Institut Rousseau 2021). Banks' resilience to climate-related risks therefore needs to be strengthened so that financial stability is guaranteed (risk-based approach).

The second function of financial regulation should be to help channel financial flows towards low-carbon activities (economic policy approach) and discourage the financing of fossil fuel-intensive activities. In particular, its role should be to structure bank balance sheets so that they are consistent with climate objectives. Unfortunately, this second dimension of prudential regulation has not yet been implemented, a major shortcoming of the financial regulatory system in the face of the climate crisis.

It must be acknowledged that the coordination between these two functions of prudential regulation—financial stabilization and allocation of financial flows—may be complicated and may lead to conflicting objectives. A study by I4CE (2020) on the inclusion of climate-related risks in banks' capital requirements emphasizes that simultaneously pursuing risk and economic policy objectives may result in conflicting goals and prove challenging for some types of financing.

Nevertheless, the difficulty of assessing some risks must not lead to inaction and "green washing", which are the greatest dangers given the climate emergency. At the very least, bank supervision must mean putting an immediate end to all financial services for new fossil fuel projects, a requirement that unconventional financing for oil and gas be effectively reduced, and demanding a plan to gradually phase out fossil fuels. Such an exit plan must be an obligation, not an option, even though it will have to take into account the serious risk due to the Ukrainian crisis and the difficulties the countries of the European Union have in obtaining supplies of oil and natural gas from Russia. Moreover, for regulatory reporting purposes, banks are expected to publish information and key indicators on climate and environmental risks they consider significant.[4] Mandatory disclosure should be implemented in order to strengthen and systematize climate risk management. Currently, no binding rules or sanction mechanisms have been instituted, and the results in this field are disastrous.[5] Only one bank in five explicitly explains the criteria and methods it uses to comply with the Paris accords.

Among the procedures implemented by banking authorities, climate stress tests seek to assess banks' ability to cope with climate shocks. As part of the prudential supervision and risk assessment process, the ECB published a document entitled "Climate risk stress test" in October 2021 and conducted a climate stress test exercise in 2022. The main differences with the stress tests of the European Banking Authority (EBA) concern the inclusion in the ECB tests of the climate risk factor, which is represented by carbon emissions. The results of the climate risk stress tests published by the ECB (2022) show that banks are not sufficiently including climate risks in their stress testing systems and their internal models.

3 - Towards a green policy mix?

Recent studies by IMF and central bank economists have concluded that economic policies need to be coordinated in order to combat climate change. For example, in their article entitled "The green swan" (Banque de France 2020), Bolton et al. argue that prudential, fiscal, and budgetary policies will be needed to complement monetary policy as part of the European Green New Deal that was rolled out in December 2019. For their part, Korgstrup and Oman (IMF 2019) insist that economic policy coordination has become necessary because of the scale and complexity of the challenges posed by climate change. The uncertainties concerning future changes in behaviors and technologies with climate change mean that public authorities need to use, and coordinate, a wide range of instruments, as illustrated in the table below.

Table 27.1: A global framework for a green policy mix

Monetary policy	*Prudential policy*	*Fiscal and budgetary policy*
Conventional policy Interest rate adjustments Collateral eligibility Differentiated reserve ratios	*Micro-prudential policy* Factoring climate-related risks in capital ratios	*Tax policy* Benchmark carbon price Carbon taxation

Unconventional policy	*Macro-prudential policy*	*Budget policy*
Green quantitative and qualitative easing Monetary financing of green public investments	Climate stress tests	Public investments Public subsidies Public guarantees

Source: authors, based on Hannoun [2010].

Implementing this new green policy mix means adjusting economic policy doctrine and governance. As far as doctrine is concerned, the role of money and the central bank in financing the state budget needs to be rethought. The recent financial and health crises demonstrated the importance and feasibility of monetary financing of public spending by the central bank. Which leads us to the notion that it will be possible for the public investment that is necessary for decarbonizing the economy to be partly financed by the central bank, as a supplement to the funding from the government's own resources (taxation).

As for economic policy governance, it should be based on the budgetary and monetary authorities coordinating with each other, in order to improve the effectiveness of those policies. Once the fight against climate change is designated a priority, it is up to the monetary and budgetary authorities to jointly implement the appropriate policies. The strategic review decided by the ECB in July 2021 is in line with this new vision, because the ECB decided to incorporate climate considerations into its monetary and financial policy. This shift, which has been acknowledged as necessary, must not just be for show, but instead be translated into ECB actions, given the imperatives of the ecological transition.

Conclusion

"Nothing is more powerful than an idea whose time has come." This motto, attributed to Victor Hugo and quoted in "The green swan" (Bolton et al. 2020), is perfectly suited to the current situation. The time for a paradigm shift has arrived. The ecological crisis is a fact, and implementing the ecological transition requires adjusting economic policies.

The history of central banking teaches us that central banks have constantly adapted to the challenges of their times (Goodhart 2010). History also shows that central banks in the past have already coordinated monetary and fiscal policy. Today, they are once again faced with challenges of a nature that test their ability to adapt.

This article has presented the modalities for greening fiscal, monetary, and prudential policies so as to be able to address the massive financing needs and substantial risks associated with climate change. The call at the One Planet international summit in 2017 for governments to adopt "green budgets" was a step in this direction. As was the creation in 2017 by central banks and supervisors of the Network for the Greening of Financial Systems.

The failures of a number of banks internationally in March 2023, triggered by the sharp rise in interest rates decided by monetary authorities in an attempt to curb accelerating inflation, will likely prove detrimental to the investments required for the ecological transition. Determined to contain the banking crisis, the main central banks, together with government authorities, provided extensive liquidities to help out banks both in the US and Europe and to secure customer deposits. The question may be asked why central banks, in conjunction with government authorities, are incapable of acting with the same determination when faced with

the climate emergency.

In conclusion, the recent experience of the financial, health, and climate crises shows that the separate and independent deployment of monetary and fiscal policies is detrimental to their effectiveness. Based on this observation, this article has analyzed the strategic role of a green policy mix in assuring the coordination of fiscal, monetary, and prudential policies in response to the challenges of climate change.

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Notes

[1] "Green Budgeting," https://www.oneplanetsummit.fr/les-coalitions-82/collaboratif-de-paris-sur-la-budgetisation-verte-103.

[2] It should be recalled that inflation twice moved into negative territory: in 2015 and then in February 2016.

[3] Nearly 150 economists from 13 European countries, including Thomas Piketty and former Belgian minister Paul Magnette, signed an appeal for cancelling debts held by the European Central Bank in exchange for a European investment plan. *Le Monde*, February 5, 2021.

[4] In November 2020, the ECB published a guide to help banks include environmental objectives in their strategy.
https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.202011finalguideonclimate-relatedandenvironmentalrisks~58213f6564.fr.pdf

[5] On March 14, 2022, Frank Elderson, member of the ECB's Executive Committee and Vice-Chairman of its Supervisory Board, unveiled the outlines of an ECB assessment report on 109 eurozone banks. The verdict is that "no bank fully meets supervisory expectations". According to the report, the banks are trying to compensate for the poor quality of the data they are disclosing by providing a large volume of information without any real substance on green issues. A lot of "*white* noise".