Macroeconomic implications of climate policies in the Global North for the Global South. The case of the European Green Deal*

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Abstract

This paper addresses a question so far under-researched in the current ecological economics literature: the potential macroeconomic effects of the EU's recent climate policies for countries in the Global South. It assesses European Green Deal policies and discusses their potential implications for commodity-dependent European trading partners. We discuss the following policies in detail: the Carbon Border Adjustment Mechanism, the recent revision of the Energy Taxation Directive and the Farm-to-Fork-strategy. The paper's main analytical focus is on the balance-of-payments implications of these policies for countries dependent on the exports of fossil fuels and agricultural products. Such implications are then assessed against the backdrop of the international monetary order.

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1. Introduction

Climate change is starting to become a global policy concern. Around the world climate mitigation and adaptation measures are launched with important macroeconomic implications. Climate transition risks coming in the form of climate policies, divestment strategies away from fossil fuels and changing consumption patterns are projected to have important macroeconomic implications – in part even trespassing those as the result of being directly affecteded by the physical effects of climate change. Buhr (2018) and colleagues estimate the additional amount countries in the Global South have to pay on capital for climate affectedness and despite the numbers being headspinningly high, they contend that the impacts of climate transition risks would be even more severe. What is more, decarbonisation efforts pose enormous risks for economic and financial stability on a global scale (Carney, 2015). However, transition risks are, because of their relative novelty and the complexity of their interaction, still largely underresearched (Batten, 2018; Jun, 2021).

In light of the above, this paper addresses one aspect of climate transition risks, namely climate policies originating in the European Union (EU). More concretely we focus on policies which fall under the umbrella of the EU's Green Deal investment plan. This plan was initiated in 2019 and is, apart from the US-American Green Deal and the Chinese decarbonisation facility, the most extensive policy package currently under way. The Green Deal aims to achieve carbon-neutrality in the EU by 2050, with intermittent energy targets defined for 2030 (European Parliament, 2021). Apart from climate targets, it also aims to "safeguard biodiversity, establish a circular economy and eliminate pollution, while boosting the competitiveness of European industry and ensuring a just transition for the regions and workers affected" (European Parliament, 2021). It is a package consisting of 55 parts (European Parliament, 2021) and is currently planned with a budget of €1.85 trillion (European Commission, 2020a). This paper takes a closer look at two policy targets in particular: (i) the replacement of fossil fuels by regenerative energy, and (ii) the reduction of meat consumption and the imports of fertilisers and soy.

The aim of this paper is to analyse the aforementioned policy targets in the light of their implication for trade relations and global (monetary) asymmetries. Since each of the policies are still very recent, the paper's assessment is confined to a preliminary description of country-specific exposure to the discussed policies.

The paper is structured as follows: The next section sets out a description of the discussed policies, followed by a critical assessment of what implications the decarbonisation efforts of the energy and transportation sector would have for the EU's trading partners (Section 3). Section 4 does the same with regard to the agricultural policy strand. Finally, Section 5 concludes.

2. Selected climate policies as part of the Green Deal

This section introduces the policies under consideration, starting with (i) those aiming to further the decarbonisation of the energy and transportation sectors via taxation, followed by (ii) policies which focus on the agricultural sector.

(i) The Energy Tax Directive and Carbon Border Adjustment Mechanism

The Energy Tax Directive (ETD) has been revised in July 2021 to harmonize it with Green Deal trajectories. The aim of the ETD is to incentivise households and businesses to move to greener alternatives by increasing the price for fossil fuels, vis-a-vis renewables, by setting a minimum taxation on energy (Boland, 2020). Revisions of ETD have put an end to exemptions for home heating, transportation and some products. What is more, the calculation basis changed from being based on quantities to being based on the energy content and the environmental impact (European Commission, 2021c).

Whilst the ETD targets domestic market participants via taxation, the Carbon Border Adjustment Mechanism (CBAM) aims to disincentivise carbon-intensive imports into the EU by imposing a tax on importers in the shape of obligatory CO_2-certificates – equivalent to the amount a domestic producer would have had to purchase (European Commission, 2021a). The importers will not have to pay the CO_2 certificates if they can prove that at another point in the production process, non-EU producers have already paid for CO_2 certificates (European Commission, 2021a). The CBAM tries to tax the carbon content by taxing products "depending on the amount of carbon emitted during their production" (Gay, 2021) to ensure that the EU's green objectives are not undermined by production relocating to countries with less ambitious climate policies" (Boland, 2020). This phenomenon is called carbon leakage, i.e. the reallocation of carbon-intense industries in avoidance of CO_2-taxes (European Parliament, 2021). The CBAM can be traced back to von der Leyen's proposal to introduce a CO_2-import tax imposed on non-EU countries (Beattie, 2019). The proposal was adopted by the European Parliament in March 2021 and implemented in mid-2021 (D'Alfonso, 2021). In its current setup, the CBAM only applies to industries subject to previously imposed carbon taxes within the EU – a requirement to be compatible with WTO legislation – namely iron, steel, cement, aluminium, fertiliser and electricity. However, by 2026, all imports are subject to the requirement to disclose their carbon-content and purchase of CO_2-off-setting certificates (European Commission, 2021a).

(ii) The EU's From Farm to Fork Strategy

In a 2020 communication, the European Commission highlighted the necessity to address the environmental impacts of agricultural practices in EU. The proposed From Farm to Fork (F2F) strategy forms an integral part of the European Green Deal and aims to transform the European agricultural sector into one that allows for a fair, healthy and environmentally-friendly food system (European Commission, 2020b). In 2018, the EU's agricultural sector accounted for approximately 10.3% of total greenhouse gas emissions where more than 60% is related to the livestock sector (European Environment Agency, European Commission, and Climate Action DG, 2020). At the same time, a recent study shows that 30% of the emissions related to the average European diet are the result of land use changes. Following Sandström et al. (2018), 70% of these land-use change induced emissions are embedded in livestock feed.

In light of the Green Deal's ambition to achieve zero net emissions by 2050, the F2F aims to reduce the agricultural sector's dependency of *critical* feed materials, such as soy grown on deforested land, through their substitution with EU-grown plant proteins, insects and algae as well as by-products from the bio-economy. This would increase the carbon-efficiency of the livestock sector through a reduction of embodied carbon emissions. Another objective of the F2F strategy is related to the promotion of plant-based diets which would imply a reduction in the amount red and processed meats and its replacement by alternatives such as plant, microbial, marine and insect-based proteins (European Commission, 2020b, pp. 10–14). If such a shift in diets is successful, the decrease in demand for red and processed meats could additionally result in an indirect and negative impact on the demand for imported soy beans used for livestock feed material.

Given the emphasis on reduction, the above ambitions can be interpreted as production and consumption policy recommendations. The first policy is aimed at producers and will incentivise a reduction of soy imports. The second policy, aimed at consumers, will result in an overall reduction of the demand for meat, which in turn indirectly reduces the demand for animal feed including soy. We hypothesise that the net-effect of both recommendations is a reduction in the demand for soy imports.

Another commodity we address in relation to external trade implications forms a more integral and clear-cut part of the Green Deal's F2F strategy: the European Commission stipulates a reduction in fertiliser use of at least 20% by 2030 (European Commission, 2020b, p. 9).

3. Implications of the ETD and CBAM for non-European trading partners

To assess the potential impacts of the ETD and the CBAM, we provide anecdotal evidence using country cases on some countries' exposure to EU climate policies. Here, we focus on the exporters of fossil fuels as their export potentials are currently already penalised by the ETD and will be additionally penalised by the CBAM. Whilst the exporters of fossil fuels will be particularly affected by the two policies, all highly dependent exporters to the EU will be by the 2026 latest – when the CBAM applies to all imports.

The main imports of crude oil to the EU in 2019 came from Russia (27 %), Iraq (9 %), Nigeria (7.9 %), Saudi Arabia (7.7 %), Kazakhstan (7.3 %), Norway (7 %) and Libya (6.2 %). Main exporters of natural gas were Russia (41 %), Norway (16 %), Algeria (8 %) and Qatar (5 %). Finally, coal exports mainly arrived from Russia (41.7 %), the United States (17.7 %), Australia (13.7 %), Colombia (8.2%) and South Africa (2.8%; Eurostat, 2021b). Considering those numbers, it appears as if the decarbonisation efforts presented here hit a wide range of high to low-income countries.

However, considering the share of exports going to the EU in a country's total exports is more conclusive to see to what extent the Green Deal policies will bear consequences for Global South countries' balance-of-payments. Though only 7.9% of the EU's crude oil imports came from Nigeria in 2019, this represents about one third of Nigeria's total exports in hydrocarbons. With fossil fuel constituting around 80% of Nigeria's exports, Nigeria is extremely exposed to the EU policies addressed here. Similarly, 90% of Libya's exports consist of fossil fuels and about 60% of its exports go to EU-countries. About 30% of Cameroon's exports consist of fossil fuels and about one third of all exports go to the EU. About half of Kazakhstan's exports consist of fossil fuels and more than one third of its exports go to EU-countries. Though only about 17% of Egyptian and Ghanaian exports consists of fossil fuels, a bit less than a third of overall exports go to EU countries (Harvard University Growth Lab, 2021).

Considering these numbers the criticism, which, especially the CBAM has received becomes substantiated: it is said that Global South countries will be disproportionately affected by the CBAM. It is important to understand that this policy is situated within the current distribution and allocation of carbon-intense industries. These industries are predominantly positioned in Global South countries as the result of the massive reallocation of capital in the past 40 years (Malm, 2015) as well as colonial heritage (Mitchell, 2011). It is therefore feared that countries in the Global South will indeed be disproportionately affected by such climate policies if not adequately accompanied by consultation processes of low-income countries within the WTO institutional setting. Even if low-income countries are not directly affected by the tariffs, their exports might be penalised indirectly when their export goods are an input in goods directly affected by the tariff (e.g. Guinean Bauxite exports to China to produce aluminium which is exported to the EU). Additionally, the calculation of the CO_2 content is costly which might be borne by the exporters if the EU does not set up and fund certification processes (Gay, 2021).

To this date, the extent of effects of the ETD and CBAM on Global South countries' trade balance is hard to assess. However, it is estimated that about $16 billion worth of exports from low-income countries are affected by the CBAM (Lowe, 2021). A report based on a model by UNCTAD (2021) simulates different scenarios with and without the CBAM against the backdrop of different carbon certificate prices (44 €/t CO_2 vs. 88 €/t CO_2) and with respect to changes in CO_2 emissions, real income and changes in exports of energy intensive goods. The figures show mixed results for countries in the Global South with some improving their real income levels and exports of carbon-intensive goods and some losing out. Here, only a couple of countries, namely the Ukraine and Bosnia-Hercegovina experience two-digit declines in exports of carbon-intensive goods under the 88€/tCO_2-certificate scenario (UNCTAD, 2021, p. 27ff.).

However, these simulations might underestimate the full scope of effects of the CBAM and ETD. Carbon certificates have already reached 60€/tCO_2, i.e. almost doubled within less than a year. So the 88€/tCO_2-certificate scenario might actually be an underestimation of likely certificate prices. What is more, it is currently still hard to project how those climate policies using CO_2 prices and other policies could interact and what price effects this could have on carbon intensive goods. Carbon taxes in trade could supress demand for imported goods ensuing less jobs in the export sectors, lower foreign exchange revenues and consequently result in less policy space in the Global South where many of the countries with a high share in exports to the EU are situated (Jun, 2021).

An alternative way to treat the CBAM and ETD (as well as the EU's Green Taxonomy[3]) is to frame their unequal impact in terms of a carbon-accounting comparative advantage for countries where CO_2-pricing and certification systems are already in place or for countries which can afford to do so. This carbon-accounting comparative advantage will likely aggravate the price pressure on carbon intensive goods by incentivising investment in substitution technologies and recycling. Furthermore, the carbon-intensity of export goods and the degree of exposure to economies with a carbon-accounting comparative advantage, predominantly situated in the Global North, become a liability for countries that lack carbon-accounting comparative advantage. This could have severe impacts on the assessment of a country's ability to service its monetary obligations with adverse effects on affected countries' exchange rates, heightened external financial instability and higher capital costs (see e.g. Kaltenbrunner, 2015; Buhr *et al.*, 2018).

In sum, hikes in CO_2-prices, demand declines in the Global North countries which enjoy a carbon-accounting comparative advantage and subsequent price declines as well as the consequential worsened assessment of countries with a high sensitivity to trade policies and price changes of carbon-intensive goods might imply severe balance-of-payments repercussions and inhibit policy space in countries in the Global South.

[3] The Green Taxonomy is currently drafted in an effort to define the conditions for economic activities and financial services to be defined as climate friendly by EU standards. Though China has had a voluntary taxonomy since 2015, the EU's Green Taxonomy is likely to set standards globally because of the degree of concretely defined absolute thresholds and because of its compulsory nature (Climate Bonds Initiative, 2020).

4. Implications of F2F Strategy for non-European trading partners

In order to provide preliminary insights on the trade implications of the F2F strategy, it is important to understand prevailing trends in the deployment, imports and exports of soy bean and fertiliser commodities. In the following subsections, such an overview is provided for each commodity.

Soy beans

Globally, the two largest producers of soybeans are the United States and Brazil. In the marketing year 2019/2020, approximately 28.48% of global soybean production was located in the United States while Brazil accounted for 37.86% of global soybean production. While Europe used to be largest importer of soybeans, in 2002 China's imports had surpassed that of Europe (USDA FAS, 2021). In 2019, China imported approximately 6.2 times more soybeans than the EU-28 countries (FAOSTAT, 2021).

Because of its versatile use soybeans are classified as *flexible crops* (Oliveira and Schneider, 2016). Apart from the international trade in soybeans, trade in soybean meal and soybean oil is also of a considerable size. Only 5% of cultivated soybeans is used for human consumption while 75% is processed into soy meal and 20% into soybean oil (WWF, 2020). In 2017, global soybean trade flows were estimated to be worth over 58 billion US$ while soybean meal trade accounted for 23 billion US$ and soybean oil for 9 billion US$ (Voora, Larrea and Bermudez, 2020). While soybean meal is mostly used for animal feed, soybean oil is used in various food products or as a biofuel (De Maria *et al.*, 2020; WWF, 2020).

However, in our assessment of the potential repercussions of a reduced soy dependency of the EU for countries in the Global South, we limit our focus to the trade of soybeans.

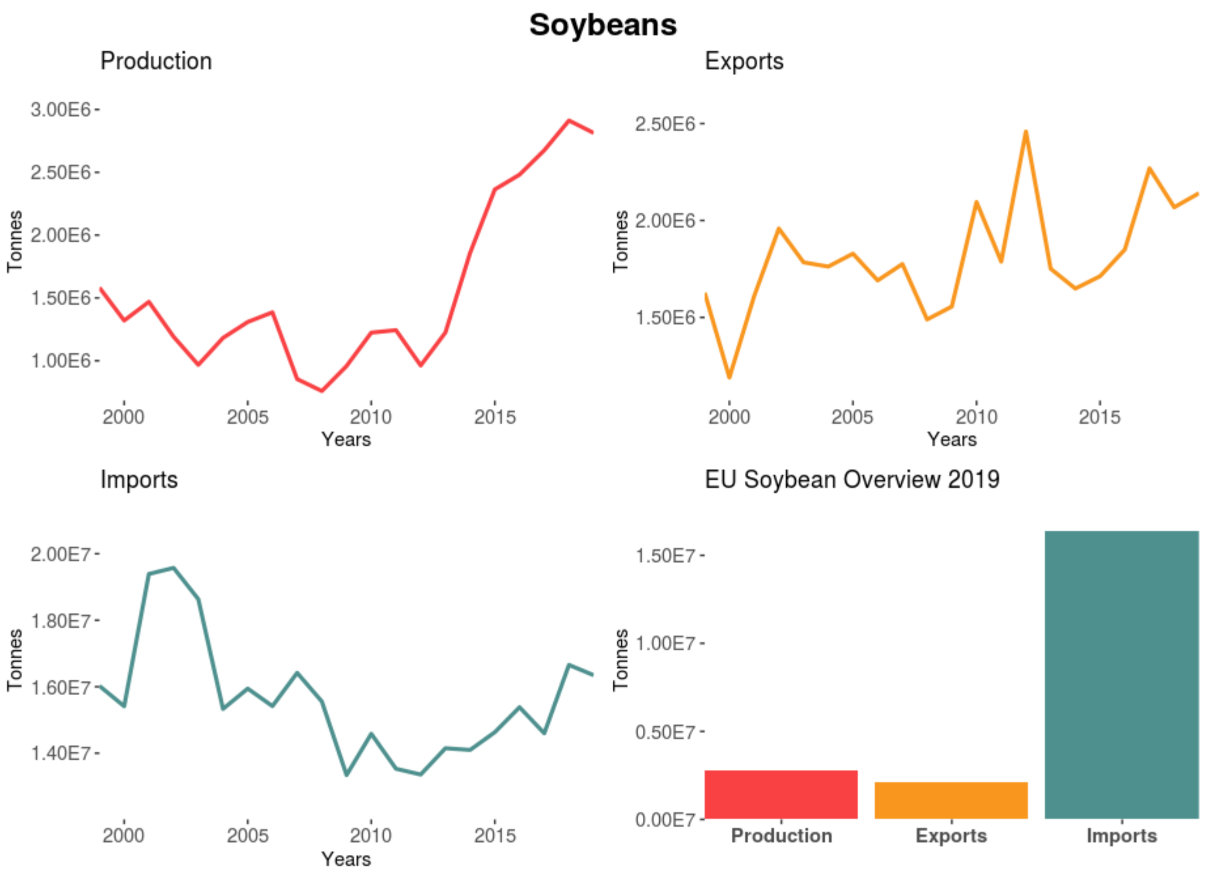

Figure 1: EU-27 soybean production, exports and imports 1999-2019. *Source: FAOSTAT* (2021)

Figure 1 shows the development of the EU's soybean production, export and imports from 1999 to 2019. Considering soybean production in the EU, the data reveals a significant rise especially after the commodity price boom prior to the 2007. Between 2013 and 2019, the EU increased its soybean production by approximately 129.79%. In the same period, the export of soybeans increased by approximately 22.26%. Finally and most importantly, the import of soybeans declined on average until 2008 and then recovered slightly. Nevertheless and despite production being on the rise, the bar chart in the lower right hand corner of the figure reveals that in 2019 imports outweigh both production and exports. In this year, the EU imported approximately 5.8 times more soybeans than it produced.

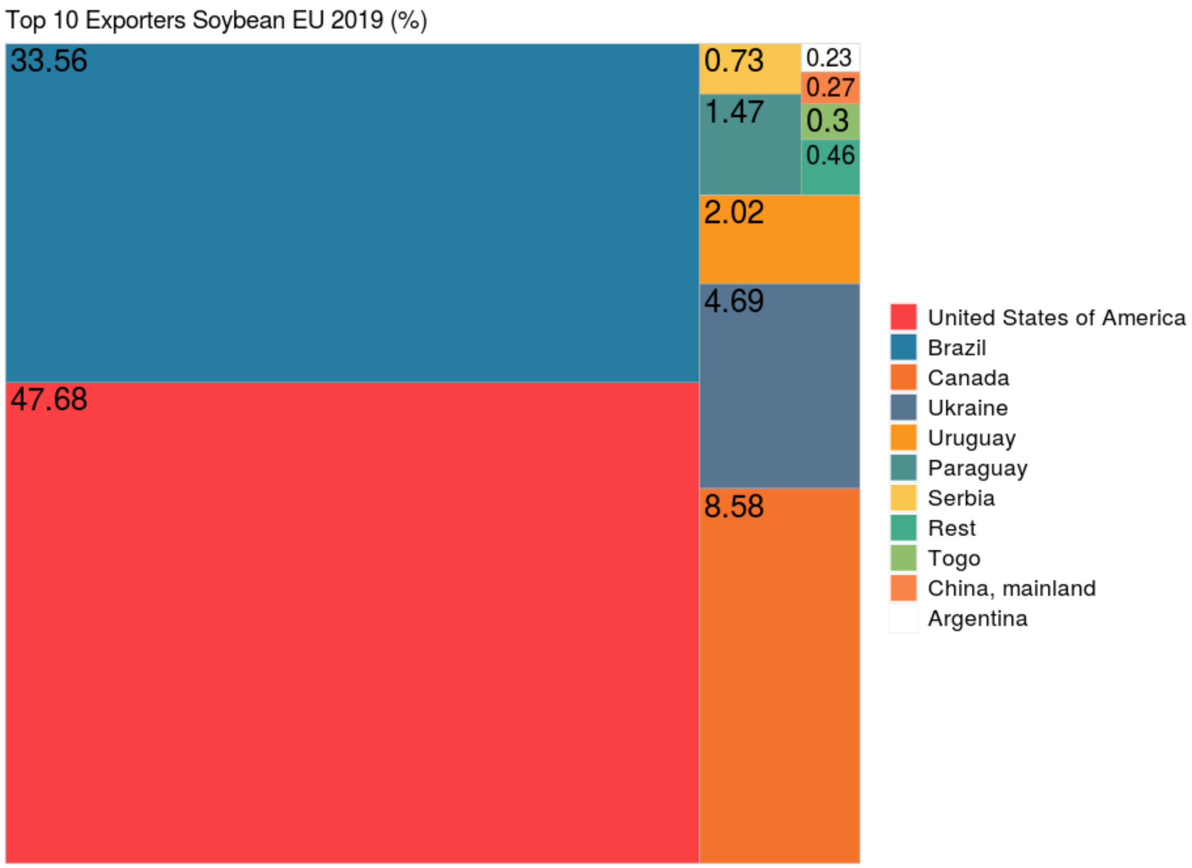

Figure 2: Top 10 soybean exporters to the EU-27. *Source: FAOSTAT* (2021)

This brings us to a decomposition of exporters of soybeans to the EU. The figure below reveals what was mentioned at the beginning of this section; the United States and Brazil represent 47.68% and 33.56% of total soybean imports in 2019 and can therefore be considered as the EU's two main trading partners. This hints that the ambitions to reduce soybean dependency and decrease the consumption of red meat will likely bear implications for the trading flows emanating from the United States and Brazil. However, a closer look at trade agreements reveals that former EU Commission President Juncker and former US president Trump agreed to enhance trade relations which implied a commitment from the EU to raise imports from the US in certain sectors, including the soybean sector (Bongardt and Torres, 2018; European Commission, 2018b, 2018a). EUROSTAT trade statistics reveal that soybean exports from the United States to the EU-27 have increased by approximately 5.24% over the period 2017-2020 (Eurostat, 2021a).

Another relevant development which potentially clashes with the EU Green Deal's ambition to reduce the EU's soybean dependency is the recently established EU-MERCOSUR trade agreement established between the EU, Brazil, Argentina, Uruguay and Paraguay. As seen in the treemap above, these Latin American countries accounted for 33.56%, 2.02%, 1.47% and 0.23%, respectively, of total European soybean imports in 2019. In an analysis of the impact of free trade and pluri-lateral treaties on the environment and agriculture, Heyl et al. (2021) highlight that previously imposed duties on soybean products used for EU feedstock will be reduced or eliminated (European Commission, 2019b).

Both the improved trade relationships between the EU and the United States as well as the EU-MERCOSUR agreement begs us to question how the EU Green Deal's aim to reduce soybean dependency is feasible. Two relatively small but emerging soybean exporters are Serbia and Togo accounting for 0.73% and 0.3%, respectively, of total EU imports in 2019. The figure below portrays the development of their exports to the EU from 1999 to 2019.

Figure 3: Soybean exports development Serbia and Togo (2000 – 2019) *Source: FAOSTAT (2021)*

Serbia is one of the largest non-EU European soy producer countries (Harper *et al.*, 2018; MLNV, 2020). Following an official 2020 news item by the Dutch Ministry of Agriculture, Nature and Food Quality, the area planted with soybeans in Serbia has increased from 131.000 hectares in 2005 to 230.000 hectares in 2019, which is said to be primarily driven by favourable demand and price developments (MLNV, 2020). Even if yields are highly dependent on weather conditions, continuous improvements in farm management are strengthening Serbia's domestic soybean sector. This weather-determined variability in yields is clearly seen in the amount of soybean exports to the EU, where the figure above indicates a significant slump in 2018 and subsequent increase in 2019. The same report indicates that the main export markets for Serbian soybean are the EU and the Russian Federation and that Serbian exports are able to secure a premium on their product for being GMO-free.

Togo is situated in the West-African region where soybeans as export goods are one the rise as a leading food crop and source of income generation (Khojely *et al.*, 2018). More specifically, soybean represents a cash crop for a significant share of subsistence farmers in Togo (Ali and Awade, 2019). In addition, the recent increase in Togolese soybean exports to the EU is said to provide agricultural farmers with an insurance against the volatility in both the yields and prices of traditional crops like coffee, cotton and cacao (ITC, 2017). While the soybeans sourced from Serbia are GMO-free, soybeans sourced from Togo are certified as organic and thereby support the EU's sustainable sourcing policy while simultaneously granting Togolese exporters a price premium (ITC, 2017, 2019). In particular, a 2020 EU Agricultural Market Brief indicates that Togo was the EU's top exporter of organic soybeans in 2019 and 2020 (37.1% share), with a percentage change of 20.4% from 2019 to 2020. The same brief indicates that the United States, Brazil, Argentina, Uruguay and Paraguay are entirely absent when it comes to the exports of organic soybeans to the EU (European Commission, 2021b).

Given that the EU's F2F Strategy highlights a reduction of dependency on *critical* feed materials, i.e. GMO soy and soy grown on deforested land, the leading question is where these reductions could come from in the face of trade-agreements, GMO-free and organic soybean providers. On the one hand, it is clear that the EU could demand the certification of soy imports from the United States and Mercosur countries which represent the largest chunk of its trade partners. However, the secondary goal of the F2F Strategy, the reduction of red meat consumption and its replacement by *home-grown (EU-based)* plant-based proteins (European Commission, 2019b, pp. 10–4), would encompass a decrease in the demand for soy independent of how it is certified. In consideration of such downward pressures on the demand for non-EU soybeans, we argue that a further exploration of the significance of EU exports for emerging trading partners, Serbia and Togo, is worthwhile.

*Table 1: S*oybean export dependency for Serbia and Togo. *Source: FAOSTAT* (2021) and *World Bank* (2021)

Year: 2019	**Serbia**	**Togo**	**Unit of measurement**
Total soybean exports	182326	52602	Tonnes
Soybean exports to EU	102936	41945	Tonnes
Export value to EU	71662	15270	1000 US$ (current)
Unit price estimate (own calculations)	696.18	364.05	US$/tonne (current)
Total export value	26277886.09	1665137.37	1000 US$ (current)
Estimate EU soybean exports weight in total soybean exports (quantity terms; own calculations)	56.46	79.74	percentage
Estimate EU soybean exports weight in total exports (value terms; own calculations)	0.27	0.92	percentage

The Table 1 exemplifies that, firstly, in 2019 the estimated unit price of Serbian soybean exports to the EU is higher than that of Togolese exports; and secondly, that the weight of EU exports in total soybean exports is relatively high for both emerging trade partners. In 2019, 56.46% of total Serbian soybean exports were destined to the EU while the Togolese estimate is as high as 79.74% hinting a high dependency on the EU's demand for soybeans. At the same time, however, an estimation of the weight of EU exports in total exports of these countries reveals that soybean exports only make up 0.27% of total export value in Serbia and 0.92% in Togo. As a result, the implications of reduced soybean exports to the EU on the balance of payments in Serbia and Togo is probably minimal.

The following section provides a similar analysis of the F2F strategy to reduce the use of fertilisers by 20% until 2030 and to develop an integrated nutrient management action plan with each of the EU Member States (European Commission, 2019a, p. 9).

Fertilisers

Historically, the deployment of fertilisers has led to massive increases in agricultural productivity levels across the globe (Erisman *et al.*, 2008; Cakmak, 2010; Savci, 2012; Valin *et al.*, 2013; Cordell and White, 2015). However, fertilisers are also responsible for reduced soil health due to the accumulation of toxic fertiliser byproducts such as arsenic, cadmium, mercury and lead (Zhang *et al.*, 2018), disrupted aquatic ecosystems ranging from lakes to oceans (McCann *et al.*, 2021) and the release of nitrogen oxides (a significant greenhouse gas) to the atmosphere (Savci, 2012). Considering phosphorus only, van Dijk et al. (2016) estimate a nutrient runoff of 1217 Gt in 2005 for the EU-27 which represented a little less than 50% of what EU-27 countries had imported in the same year. More recently, Schulte-Uebbing and de Vries (2021) identified that 85% of the thresholds of biodiversity loss, euthrophication and drinking water pollution associated with nitrogen losses had been exceeded on EU agricultural lands. The EU's strategy to reduce the use of fertilisers has to be understood.

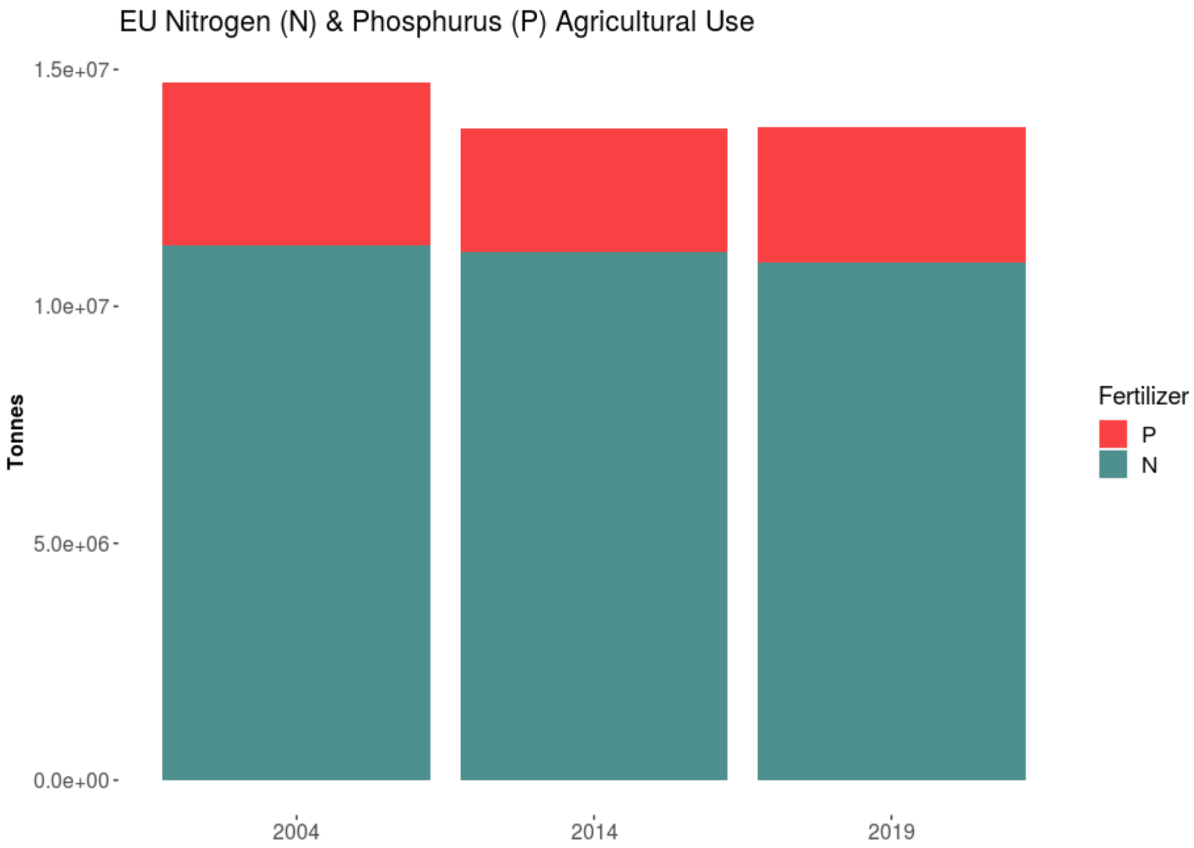

Figure 4: Agricultural use of nitrogen and phosphorous fertilizers in EU-28 in 2004, 2014 and 2009.
Source: FAOSTAT (2021)

Figure 4 illustrates the development of both nitrogen and phosphurus fertiliser use in 2004, 2014 and 2019. Compared to 2004, nitrogen fertiliser use in the EU has decreased by 3.03% while phosphorous fertiliser use decreased by 17.61% in 2019. A closer look at the development of EU fertiliser production, imports and exports reveals a more complex picture however. Figure 5 reveals that the EU is not only a significant importer but also a producer and subsequent exporter of fertilisers. According to the 2019 Agricultural Market Brief, the EU produced 9% of global nitrogen and 3% of global phosphate in 2016 (European Commission, 2019a). It is therefore equally relevant whether the reduced use of fertilisers within the EU will also be accompanied by decreases of exports which could counteract the ambitions to reduce biodiversity losses and pollution associated with nitrogen and phosphorous fertilisers.

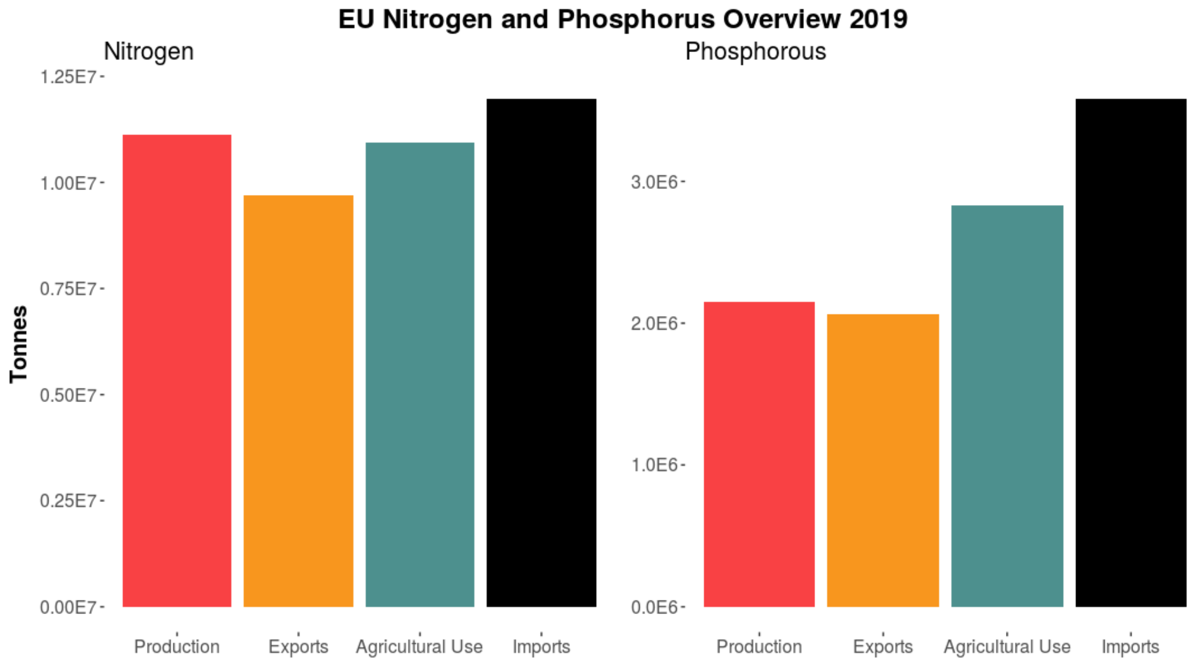

Figure 5: Production, exports, agricultural use and imports of N,P fertilisers in EU-28. *Source: FAOSTAT (2021)*

Whether most of the fertilisers produced in the EU are exported or used domestically is unclear and requires further analysis in order to assess where the proposed 20% reduction should come from. In any case, a breakdown of the EU's main nitrogen fertiliser suppliers in 2018 is presented in the Figure 6.

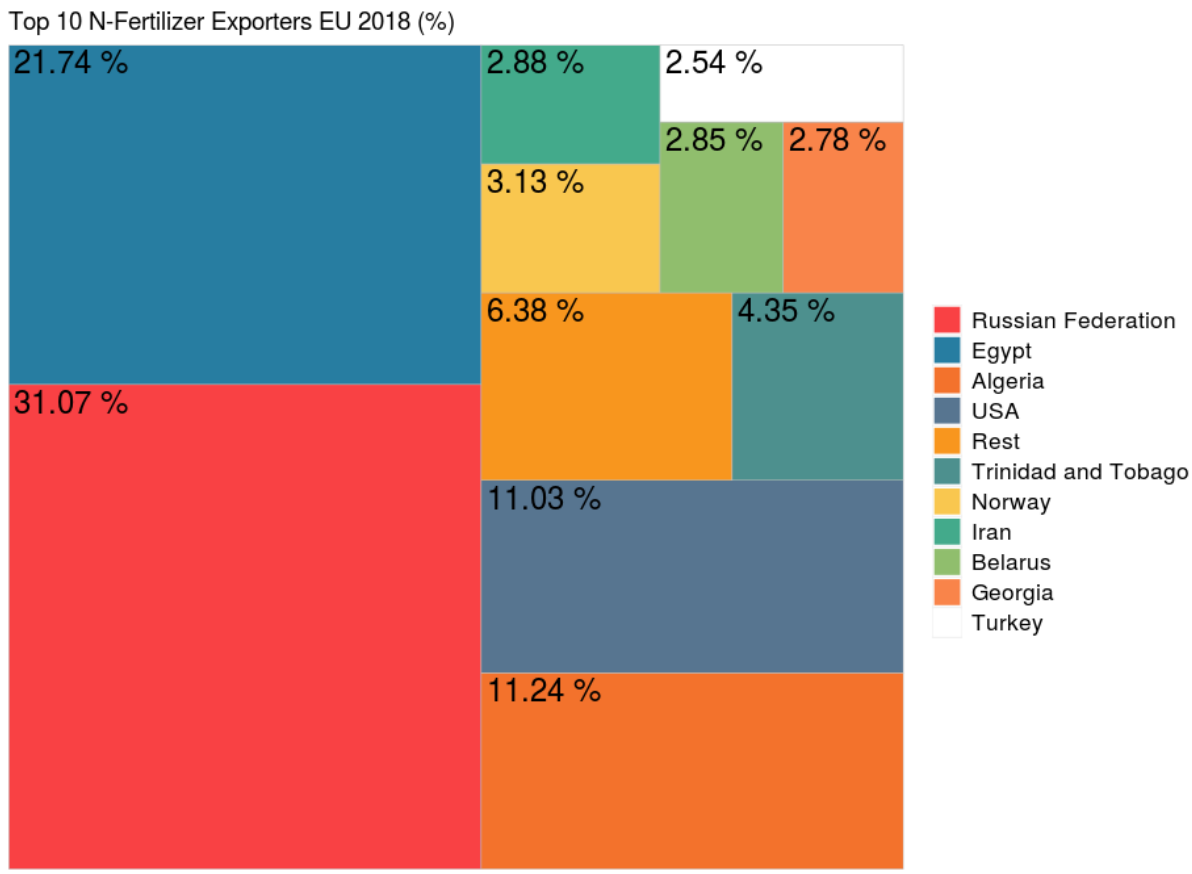

Figure 6: Top 10 nitrogen fertilizer exporters to the EU-28 in 2019. *Source: (DSA/UNSD, 2021)*

Unlike the trade partners in soybean, the EU's trade partners are much more diversified when it comes to nitrogen fertilisers. After the Russian Federation, accounting for 31.07% in 2018, Egypt and Algeria represent the EU's second and third largest supplier of nitrogen fertilisers, accounting for 21.74% and 11.24%, respectively. Because we are particularly interested in low-income countries, we consider Egypt and Algeria in detail.

Table 2 shows that the estimated unit price of exported nitrogen fertilisers to the EU is more or less equal in Egypt and Algeria in 2017. Both countries, however, heavily rely on the EU as a trading partner when it comes to their export of nitrogen. In 2017, EU imports of nitrogen fertilisers accounted for approximately 53.05% of total Egyptian nitrogen fertiliser exports and 47.58% of total Algerian nitrogen fertiliser exports. But against the backdrop of the value of total exports for each of the nations, the weight of nitrogen exports is practically nil. In Egypt, nitrogen exports accounted for 1.62% of its total value of exports and only 0.44% of Algerian exports in 2017. As a result, the implications of fertiliser use reductions as outlined in the EU F2F strategy is likely to be minimal for both Egypt and Algeria. Further research could assess whether such findings also hold for EU's trading partners with a smaller share of EU imports such as Trinidad and Tobago, Iran, Belarus and Georgia.

Table 2: Nitrogen fertilizer export dependency for Egypt and Algeria. *Source: DSA and UNSD* (2021) *and World Bank (2021)*

2017	**Egypt**	**Algeria**	**Unit of measurement**
Total nitrogen exports	4464757	1378136	tonnes
Nitrogen exports to the EU	2368579	655656	tonnes
Export value to EU	605081.83	170250.43	1000 US$ (current)
Unit price estimate (own calculations)	255.46	259.66	US$/tonne (current)
Total export value	37289402.17	38496751.46	1000 US$ (current)
Estimate EU nitrogen exports weight in total nitrogen exports (quantity terms; own calculations)	53.05	47.58	percentage
Estimate nitrogen exports weight in total exports (value terms; own calculations)	1.62	0.44	percentage

Diversity in trade partners of phosphorous fertilisers is less pronounced as represented in Figure 7. Morocco constitutes the largest share of EU's phosphorous fertiliser imports (47.59%) followed by Israel (31%) and Lebanon (9.44%).

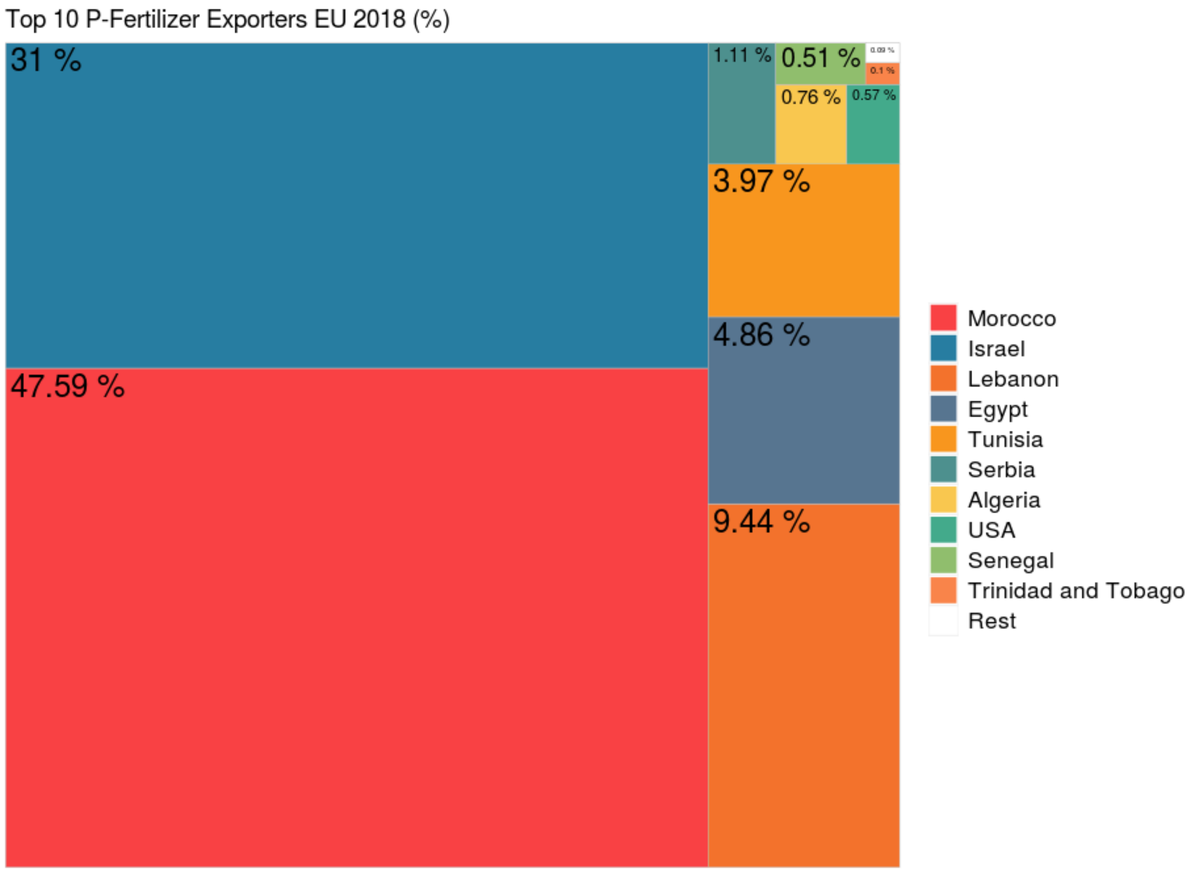

Figure 7: Top 10 phosphorous fertilizer exporters to the EU-28 in 2019. *Source: DSA and UNSD* (2021)

Table 3 summarise the relative dependency on phosphorous imports by the EU of major importers to the EU.

Table 3: Phosphorous fertilizer export dependency for top 3 exporters. For units of measurement see Tables 1 and 2. *Source: DSA and UNSD* (2021) *and World Bank (2021)*

2018	**Morocco**	**Israel**	**Lebanon**
Total phosphorous exports	1062635	798983	215477
Phosphorous exports to the EU	374677	244109	74326
Export value to EU	92647.93	78115.42	22004.76
Unit price estimate (author's own calculation)	247.27	320.00	296.05
Total export value	45794739.02	110404284.23	11389185.93
Estimate EU phosphorous exports weight in total phosphorous exports	35.26	30.56	34.49
Estimate phosphorous exports weight in total exports	0.20	0.07	0.19

In terms of the estimated unit prices for 2018, it seems like Morocco is able to provide phosphorous fertilisers to the EU at a more competitive price compared to Israel and Lebanon. Indeed, Morocco is the country with the largest phosphate reserves and a general leading exporter of phosphate, with an estimated global market share of approximately 30% in 2016 (Hakkou, Benzaazoua and Bussière, 2016). While the EU imported approximately 35.26% of Morocco's total phosphate fertiliser exports, the estimated weight of phosphorous fertilisers in total exports value is only 0.20%. A similar share in total phosphorous export quantities and total export value is seen for Lebanon however, while in 2018, Lebanon only constitutes 9.14% of total EU imports. This indicates that compared to Morocco, Lebanon is *more* dependent on its phosphorous exports to the EU. In any case, the shares in total exports for each low-income countries addressed here, is far too little to draw any final conclusions on the impact of the EU's F2F strategy on the balance of payment constraints in some of its main trading partners when it comes to fertilisers.

This section's aim was to illustrate the relevance of EU trade with low-income countries in light of the agricultural agenda embodied in the EU Green Deal, namely the Farm to Fork strategy. While one cannot draw clear-cut conclusions for the balance of payment constraints of developing countries with respect to soybean and fertiliiser commodities from the presented descriptive statistics, they at least highlighted the necessity of the F2F strategy to clarify the path to stipulated reductions. What is more, a number of questions remain open: How does a reduced dependency on *critical* soy affect the existing trade agreements between the EU and the United States and MERCOSUR? Will organic and GMO-free soy completely substitute *critical* soy? Does the promotion of EU soybean-production imply a reduction in soybean imports as a whole? These are all questions that must be answered if the EU Green Deal is indeed a policy package which aims to tackle the global problem of climate change in a globally equitable manner. Similarly, when it comes to fertilisers, the F2F strategy should specify firstly, the exact composition of current agricultural use of fertilisers (how much percent is imported, how much percent is domestically produced?) after which it must stipulate the proposed 20% reductions are aimed at domestically produced or imported fertilisers.

5. Conclusion

The first assessment of the Energy Taxation Directive and the Carbon Border Adjustment Mechanism concludes that enormous trade repercussions for exporters of fossil fuels and other carbon-intensive goods are likely. With 2026 marking the year of all EU-imports becoming mandatory for CO_2-classification, the number of affected goods and therefore trading partners' competitiveness is going to increase. With exposure to European trade policies as high as 50% as measured by the share of exports of fossil commodities to the EU in overall exports, this will significantly strain, predominantly low-incomes countries' trade balance and therefore aggravate their external constraint. Against this backdrop, the paper supports the claim that climate transition cannot be achieved without addressing the international monetary system otherwise it would deepen international asymmetries (Svartzman and Althouse, 2020). The latter is likely to increase carbon intensity as countries being faced with the double challenge of managing their balance of payments constraint and their affectedness by climate change and transitions are forced to intensify their carbon-intense exports counteracting climate goals (Carnevali *et al.*, 2019).

Less equivocal was the analysis of the Food to Fork strategy. The addressed trading partners' exposure to the policy measures implied in the policy strategy is here much less pronounced. However, the analysis hints that mechanics of effects are likely to be different from those that follow from the ETD and CBAM: whilst the latter two deteriorate the competiveness of exporters of carbon-intense goods via price increases within the EU via higher taxation as well as carbon-accounting competitive advantages, the F2F strategy is likely to increase the EU's competiveness vis-à-vis non-European producers of soy and fertilisers.

In sum, against the backdrop of both policy packages, a likely scenario is an increase in self-sufficiency of the EU with adverse effects for countries dependent on exports going to the EU. Decreases in the EU's demand of imported fossil fuels, soy and fertilisers, the increased production of the latter two by the EU, respectively, is likely to exercise pressure on international prices of these commodities. This price effect might additionally harm the current account balance of countries dependent on the export of those goods, which are mostly situated in the Global South. This might in fact increase global asymmetries in regard to the distribution of potentials to generate foreign exchange revenues – with a deepening of monetary asymmetries as consequence. These processes impede the possibility of a vast number of countries to conduct both climate mitigation and adjustment measures. It can therefore be concluded that policies – as the ones discussed here – targeting climate change without simultaneously addressing global inequalities is likely to deepen those inequalities and to counteract climate protection efforts.

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