TASK FORCE ON CLIMATE, DEVELOPMENT AND THE INTERNATIONAL MONETARY FUND

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Transition Spillover Risks and IMF Surveillance on Climate Change

IMPLICATIONS FOR DEVELOPING COUNTRIES

VULNERABLE TWENTY GROUP

INTERGOVERNMENTAL GROUP OF TWENTY FOUR G-24

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About the Task Force on Climate, Development and the International Monetary Fund

The Task Force on Climate, Development and the International Monetary Fund (IMF) is a consortium of experts from around the world utilizing rigorous, empirical research to advance a development-centered approach to climate change at the IMF. The Task Force believes it is imperative that the global community support climate resilience and transitions to a low-carbon economy in a just manner. As the only multilateral, rules-based institution charged with promoting the stability of the international financial and monetary system, the IMF has a vital role to play in supporting a globally coordinated response.

MEMBER ORGANIZATIONS

- Intergovernmental Group of Twenty-Four (G24)
- Vulnerable Group of Twenty (V20) Ministers of Finance
- African Economic Research Consortium
- Boston University Global Development Policy Center
- National School of Development, Peking University
- Centre for Social and Economic Progress
- Financial Futures Center
- United Nations Economic Commission for Latin America and the Caribbean

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EXECUTIVE SUMMARY

Climate change policies that occur in one nation can have significant macro-critical implications in other countries (Ramos et al. 2021). This policy brief discusses how carbon taxes and Carbon Border Adjustment Mechanisms (CBAMs) pose 'transition spillover risks' that affect trade patterns, balance of payments and debt sustainability in developing countries. As the only rules-based, multilateral institution charged with maintaining the financial stability of the global economy, it is paramount that the International Monetary Fund (IMF) incorporate transition spillover risk analysis in its surveillance activities. In addition to this, there must be further support for countries in identifying early policies and investments that can prevent and mitigate such risks in a manner that aligns macroeconomic, financial and climate policies.

To date, there has been very limited attention to transition spillover risks in the world economy. Two technical papers authored by members of the Task Force on Climate, Development and the IMF address these major knowledge gaps. The first paper by He *et al.* examines the welfare and macroeconomic implications of the European Union's (EU) CBAM (He, Zhai and Ma 2022). This paper estimates the macroeconomic impact on developing countries that are major trading partners of the EU, providing a crucial baseline for assessing other CBAMs that may be introduced. The authors find that a European CBAM would adversely impact exports and welfare in many developing countries. In fact, the economy of Mozambique is estimated to shrink by 2.5 percent, Russia by 0.6 percent, and the gross domestic product (GDP) of India, Egypt and Turkey by almost 0.3 percent.

A second paper by Gourdel *et al.* examines the extent to which the introduction of a carbon tax in China, aligned with the scenarios of the Network for Greening the Financial System (NGFS), would ultimately lead to a coal phase out in China that impacts Indonesia's economy (Gourdel, Monasterolo and Gallagher 2022). The authors find that this transition spillover risk introduces a trade-off: on one hand, it would be quite significant for Indonesia by adversely impacting its balance of payments, financial stability and economic growth, given that China currently imports a large share of Indonesian coal. On the other hand, however, the Chinese coal phase out would also reduce carbon dioxide emissions in Indonesia, mostly due to lower mining emissions.

Given the findings of these two papers, the Task Force outlines four policy recommendations for the IMF and its role in both assessing and mitigating transition spillover risks, particularly for developing countries:

- Enhance surveillance efforts to help member states identify, prevent and mitigate transition spillover risks.
- Retool and improve modeling approaches that can capture spillover risk transmission channels, estimate probable impacts and identify risk mitigation options.

- Assist countries in building resilience to spillover shocks by diversifying economies and working with multilateral development banks (MDBs) to mobilize resources for a structural transformation.
- Use specific instruments to help countries address spillover risks, such as the proposed Resilience and Sustainability Trust (RST) or an Equitable Decarbonization Fund (EDF). The EDF could be resourced through revenue generated from CBAMs and re-channel resources back to carbon-intensive developing countries to support green transition efforts.

INTRODUCTION

The need to identify and address spillover risks from climate change policy is recognized in the Paris Agreement. In Article 4.15, the Paris Agreement requires countries to "take into consideration…the concerns of Parties with economies most affected by the impacts of response measures, particularly developing country Parties" (UNFCCC 2015). These 'response measures' include climate policies designed to reduce the use of fossil fuels as well as trade measures on imported goods.

The IMF has incorporated non-climate-related spillover analysis in its work since the 1990s. The Fund focuses its bilateral surveillance on those policies that can significantly influence present or prospective balance of payments and domestic stability. Thus, the Fund's surveillance efforts increasingly cover the actual or potential impact of 'inward spillovers' on a member state's economic and financial stability (IMF 2021d).

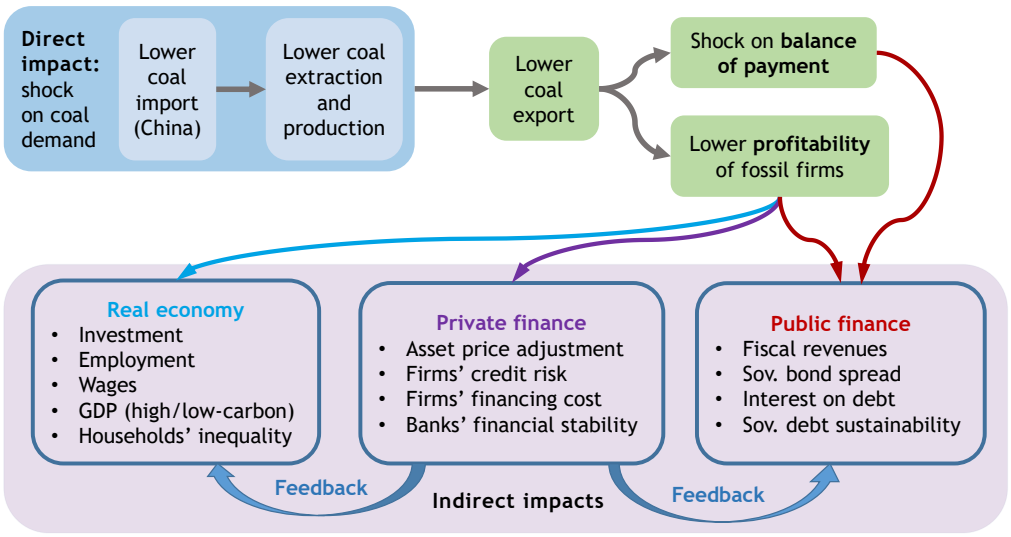
Inward spillovers refer to external shocks that have macro-critical impacts on a particular member state. These can stem from global trends, policy measures adopted in other countries and climate impacts. This policy brief specifically focuses on inward spillovers arising from shifting to a low-carbon economy. The IMF's 2021 Comprehensive Surveillance Review (CSR) identifies the importance of including 'inward spillovers' in Article IV consultations, the IMF's annual assessment of member countries' financial health (IMF 2021b). With respect to climate change, the CSR focuses on domestic policy challenges and inward spillovers in the context of climate adaptation and transition management.

The three main types of climate risks—physical risk, transition risk and transition spillover risk—have macro-critical implications through different risk transmission channels. Drawing on Gourdel *et al*. (2022), Figure 1 outlines the main macroeconomic and financial channels through which transition spillover risks can cascade from one country to another.

Figure 1 specifically illustrates the risk transmission channels of the introduction of carbon pricing in China on the real economy and private and public finance of Indonesia. A shock on coal demand from China can lead to a lower import of coal from Indonesia, negatively affecting its coal production and export. In turn, the lower export affects Indonesia's balance of payments, with negative implications on public finance, through lower fiscal revenues, which in turn affect governments' fiscal budget and debt service, with implications on bond spread and debt sustainability. Similarly, lower profitability of fossil fuel-intensive firms means lower investments, higher unemployment and lower GDP.

The risk transmission channel for a CBAM is similar. When an importing country levies a charge on imported goods in proportion to the embodied carbon emissions, the price of the imported goods, relative to domestic goods, will go up. Reduced demand for imported

FIGURE 1 Transmission channels of a shock on coal exports



Source: Gourdel et al. (2022).
Note: We distinguish between the direct impact of the shock (on the mining sector that is hit by export reduction) from its indirect impacts (reduced workforce, lower profitability, etc).

goods will lead to a deterioration in the balance of payments for trading partners and will also impact the profitability of firms producing the traded goods. Ultimately, CBAMs will also lead to indirect implications on welfare, such as GDP growth rate. Feedback between private and public financial actors, via financial exposures, can amplify the original economic shock, with potential implications for individual and systemic risk.

This policy brief summarizes two such assessments of spillover risks when carbon prices are introduced, either domestically or to country's imports. The first is a global assessment of the real economy impacts of a CBAM in Europe on economic activity outside of the EU. The second is an assessment of transition spillover risk that Indonesia may face stemming from China's introduction of policies to shift away from coal. Following a short synthesis of each of these papers, we offer policy recommendations for IMF policy and beyond.

SUMMARY: THE GLOBAL IMPACT OF A CARBON BORDER ADJUSTMENT MECHANISM

In 2021, the EU announced that it would implement a CBAM as a part of the European Green Deal. The CBAM will impose a levy on imported non-EU products that adjusts for the differences between the EU Emission Trading System (ETS) price and the carbon price paid in the producing countries. The CBAM will come into force in January 2026 after a three-year transition.[1] The goal of the CBAM is to level the playing field between EU and imported products. In other words, by applying an adjustment to products originating in countries that do not apply an equivalent carbon price, the EU aims to maintain the integrity of its climate policies while minimizing competitiveness impacts.

[1] European Commission. July 2021. Proposal for a Regulation of the European Parliament and of the Council: Establishing a Carbon Border Adjustment Mechanism.

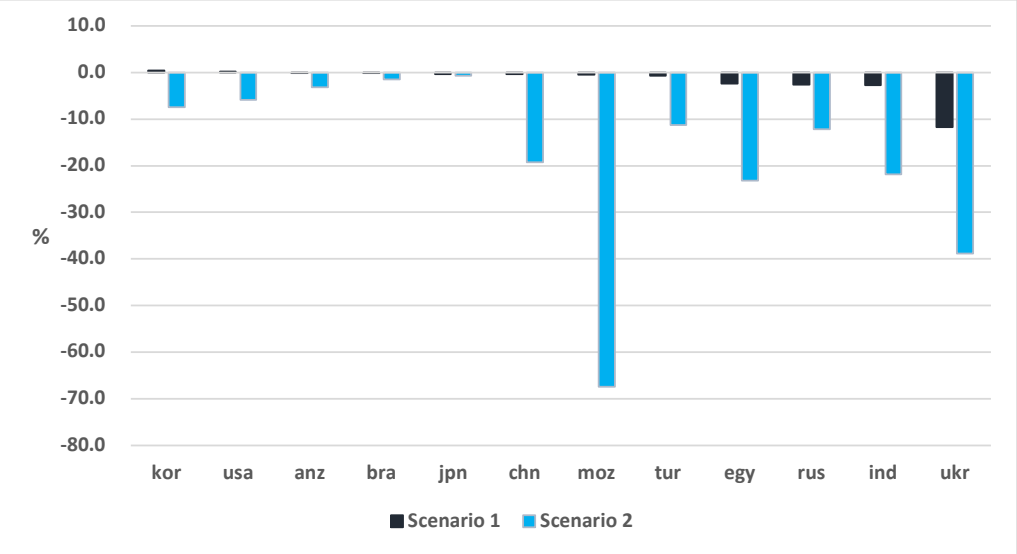
While the global distributional impacts of carbon border taxes have been a concern in academic scholarship, these exercises—and as such, the potential consequences—have largely been conceptual. With a concrete EU CBAM proposal, the authors investigate how such a border adjustment tax will impact developing countries. In particular, the paper examines how a border carbon tax leads to macroeconomic impacts in the EU's trading partners, especially those that are carbon-intensive exporters.

This paper uses a dynamic computable general equilibrium (CGE) model to assess the quantitative impact of the CBAM and identifies countries that are the most vulnerable to transition spillover risks. The paper utilizes two scenarios: the first scenario simulates the current EU CBAM proposal in the context of direct emissions from the production of goods, and the second scenario includes the broadest possible implementation of the CBAM, accounting for both direct and indirect emissions throughout the value chain. While the EU has said that it will revisit the precise scope of the CBAM in 2026, the authors utilize Scenario 2 to identify its maximal application.

In Scenario 1, the EU CBAM leads to a major increase in tariff equivalents on carbon intensive products. Countries such as India, Kazakhstan, China, Brazil and others are important exporters of chemicals, non-metallic metals, non-ferrous metal and iron. While terms of trade worsen for exporting countries, the overall macroeconomic effects are moderate. The macroeconomic impact of the CBAM on China is mild because the CBAM only accounts for 6 percent of China's exports.

In Scenario 2, where the CBAM covers all sectors, and both direct and indirect emissions are considered, the tariff equivalents increase to around 5 percent. Exports from China, India, South Africa and Kazakhstan fall. Economies such as Kazakhstan and Mozambique shrink by 1 percent and 1.5 percent, respectively. Chinese exports to the EU fall by 9 percent; however, the overall effect on China's GDP is mild. Figure 2 demonstrates how total exports to the EU would change, and Figure 3 reflects the impact of the CBAM on GDP.

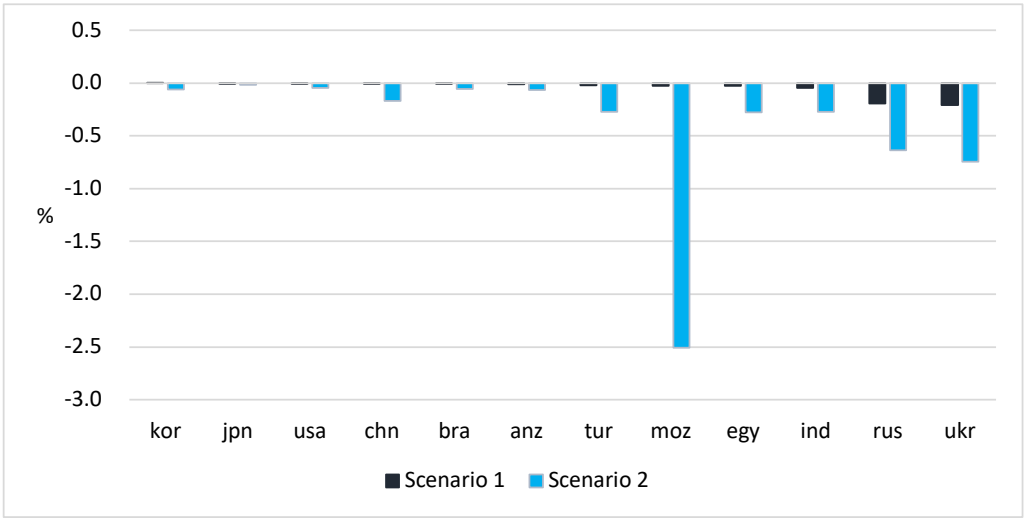
FIGURE 2 Impact of the CBAM on Total Exports to EU (% change from baseline)



Source: He et al. (2022)
Note: Kor = South Korea, USA = United States, Anz = Australia and New Zealand, Bra = Brazil, Jpn = Japan, Chn = China, Moz = Mozambique, Tur = Turkey, Egy = Egypt, Rus = Russia, Ind = India, Ukr = Ukraine

In terms of welfare, as shown in Figure 3, a European CBAM would adversely impact exports and welfare in many developing countries. In fact, the economy of Mozambique is estimated to shrink by 2.5 percent, Russia by 0.6 percent, and the GDP of India, Egypt and Turkey by almost 0.3 percent.

FIGURE 3 Impact of the CBAM on GDP (% change from baseline)



Source: He et al. (2022)
Note: Kor = South Korea, USA = United States, Anz = Australia and New Zealand, Bra = Brazil, Jpn = Japan, Chn = China, Moz = Mozambique, Tur = Turkey, Egy = Egypt, Rus = Russia, Ind = India, Ukr = Ukraine

The bottom line: Countries that rely on carbon-intensive exports to the EU will be disproportionately impacted by the CBAM. The results suggest that the CBAM would reinforce income inequality between developed and developing countries. More generally, the findings from this paper underscore the need for the IMF to identify and address transition spillover risks, particularly as CBAMs potentially become a more mainstream climate policy tool.

SUMMARY: CLIMATE TRANSITION SPILLOVERS AND SOVEREIGN RISK: EVIDENCE FROM INDONESIA

This paper examines how the introduction of a carbon price in China, aligned with scenarios devised by the NGFS, can affect Indonesia's macroeconomic and financial positions. Indonesia is highly vulnerable to transition spillovers both because of the dominance of coal among its exports and the large share of coal in Indonesia's energy mix (NGFS 2021). Therefore, Indonesia is exposed to stranded asset risk, or assets (like coal) that no longer generate returns, not only through its own policies to decarbonize the economy, but also because of the climate policies introduced by its major trading partners. Policies adopted by Indonesia's major trading partners are likely to lead to a decrease in the demand for Indonesian coal. Given China's role as the biggest importer of Indonesian coal, Indonesia is especially vulnerable to China's ambitious climate policies, and this paper seeks to understand these specific impacts and provide a modeling framework for future analyses.

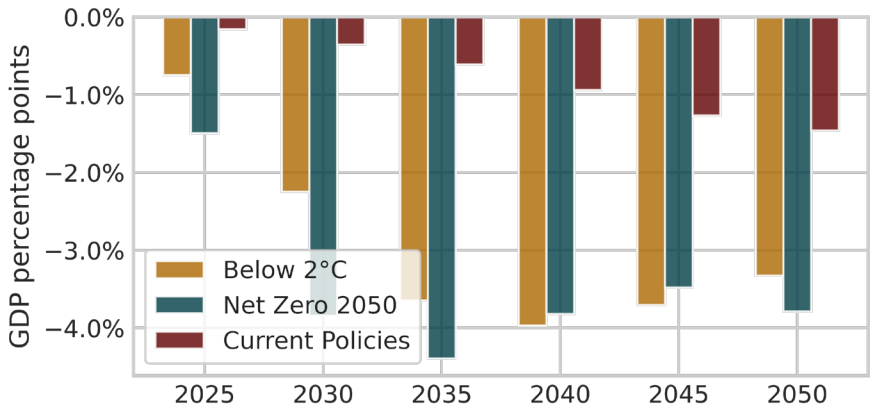
First, the paper identifies the channels through which climate transition spillover risk affects the real economy and public and private finance (see Figure 1 above). Then, it provides a

forward-looking quantitative assessment of lower Chinese demand for coal, according to NGFS scenarios, on the size of the impact of relevant macroeconomic variables such as GDP, balance of payments and debt-to-GDP ratio. For this analysis, the paper tailors the Stock-Flow Consistent behavioral model EIRIN, which has previously been used to assess climate risks (Monasterolo and Raberto 2018; 2019; Dunz et al. 2021; Rozenberg et al. 2021).

The authors show a trade-off between sovereign risk and decarbonization in Indonesia. On the one hand, a reduction in coal demand from China, both in the Below 2°C and Net Zero 2050 scenarios, leads to lower greenhouse gas (GHG) emissions in Indonesia via lower coal production and use. The decline in emissions due to spillover effects is greater in the Below 2°C and Net Zero 2050 scenarios than in the Current Policies scenario.

However, on the other hand, a sharp decline in Indonesian coal exports leads to a downturn in activity in the mining sector, and ultimately, leads to higher unemployment, lower GDP, lower public revenue and a higher debt-to-GDP ratio in Indonesia.

FIGURE 4 Impact of reduced coal exports on Indonesia's GDP in Current Policies, Net Zero 2050 and Below 2°C scenarios



Source: Gourdel et al. (2022)

In terms of public finances, the authors focus on balance of payments, the budget balance to GDP ratio and the debt-to-GDP ratio. The decrease in coal demand from China translates into a 6 percent drop in GDP by 2050. Under Below 2°C and Net Zero 2050 scenarios, the budget balance to GDP is almost 2 percent lower when including spillover risks as shown in Figure 4. The deterioration in the budget balance arises from direct and indirect impacts, the former being the loss of revenue from the mining sector, which generates indirect negative impacts on the macroeconomic dynamics. These, in turn, lead to cascading effects on public finance. While public debt increases substantially, the authors find that it remains manageable.

Table 1 captures the main results. The authors highlight the importance of accounting for transition spillover risks in modeling exercises, in order to provide a comprehensive picture of the climate, financial and distributive effects of climate policies, either introduced in the country of interest, or by its trading partners. Furthermore, the authors identify the need to adopt fiscal measures or pursue external financing options from the IMF and other venues to ensure the sustainability of public finance and public debt in the transition to a low-carbon economy.

TABLE 1 Summary of main macroeconomic and environmental results

Variable	Spillover Risk	Low-Carbon Transition Policies
GDP	↓	↑
Balance of payments	↓	~
Public debt	↑	↑
Unemployment	↑	↓
GHG emission	↓	↓

Source: Gourdel et al. (2022)
Note: The *spillover risk* column refers to the effect of adding effects from a shock on fossil fuel exports to a scenario. The *low carbon transition policies* column refers to the effect of moving from one scenario to the other, in the direction of more stringent climate change mitigation. A *downward arrow* denotes negative impacts, an *upward arrow* denotes positive impacts, and a *tilde* means there is no significant impact, or that it varies depending on other conditions.

The bottom line: The reduction in coal exports to China would impact Indonesia's balance of payments, budget and public debt. While the coal demand shock reduces Indonesia's carbon emissions, it doesn't fall enough to meet Indonesia's climate target. The impact on public debt is non-negligible; however, the low base prevents it from being unmanageable. The deterioration in Indonesia's debt profile needs to be mitigated through other fiscal measures and/or with the support of external finance.

IMPLICATIONS FOR IMF POLICY AND BEYOND

The findings from these papers clearly underscore the macro-critical nature of transition spillover risks. These results also underscore the special vulnerability of developing countries to spillover risks, which is amplified by limited fiscal space and difficulty in accessing external financing. The IMF has, indeed, identified the need to monitor spillovers in general and transition risks in particular in its policy documents, including the CSR and its climate strategy (IMF 2021d; 2021c; 2021a). The CSR, in its background paper on integrating climate change into Article IV reports, identifies the importance of including 'inward spillovers' in Article IV consultations (IMF 2021b; 2021c). In the same document, the IMF has emphasized the need to identify 'options to further strengthen policies to minimize outward spillovers while promoting the country's own [balance of payments] and domestic stability' (*ibid.*)

It is imperative that the IMF calibrates its surveillance tools such as global surveillance efforts in the World Economic Outlook and Global Financial Stability Reports to recognize early transition spillover risks. 'Outward spillovers' of policies implemented in major economies will have macro-critical ramifications for trading partners and other economies, which means they are systemically important as well. The analysis of 'outward spillovers' cannot be left to Article IV consultations alone, especially if its inclusion is voluntary and limited to the largest 20 emitters. Moreover, transition spillover risks should be assessed in bilateral surveillance activities such as in Article IV reporting, Financial Stability Assessment Programs and Debt Sustainability Analyses. Equally important is the need for early identification to be matched with early action recommendations in policy and investment, from official sources and private sector participation.

Modeling approaches will also have to be retooled and improved to accurately capture spillover risk transmission channels. This policy brief offers two modeling approaches that could be incorporated into the IMF toolkit to perform surveillance on the impact of transition spillover risk on the real economy, financial stability and fiscal sustainability. They also document that climate change is macro-critical not just because of 'insufficient mitigation policies,' as the CSR anticipates, but also because of stringent climate policies that have cross-border ramifications.

In collaboration with MDBs, the outcomes of such analyses should be used help countries diversify their economies away from carbon intensive sectors in a manner that maintains fiscal and financial stability. Identifying spillover risks will also be important to ascertain the external resources that countries will need to mitigate spillover transition shocks and to invest in the structural transformation necessary to reach net zero globally by 2050.

As the Task Force has argued in its initial Strategy Report, the IMF will need to provide both short-term finance to help address balance of payments and liquidity challenges from transition spillover risks as well as long-term finance for countries to make the necessary policy changes and investments needed to safeguard against spillover risks (Task Force 2021a). A well-designed, regularly replenished RST could serve this function, as could an 'Equitable Decarbonization Fund' financed from CBAMs and domestic carbon taxes in source countries (Task Force 2021a; 2022).

As this is the most important decade to substantively address climate change, the IMF faces a crucial moment to step into its role as a global coordinator in climate policy for both lasting stability and growth of the global economy, and human well-being worldwide.

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