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Climate Change and Green Finance in Emerging Market Economies: The Open Economy Dimension

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Abstract

The paper reviews the alternatives available to Emerging Market Economies (EMEs) to finance investment required to mitigate and adapt to climate change. It also takes into account the financial needs to achieve the Sustainable Development Goals (SDGs). Since the requirements dwarf the financial capabilities of the public sector in EMEs, the paper explores possible funding channels focusing on international financial markets. The paper identifies potential obstacles to a smooth and sustainable finance provision, including the influence of the global financial cycle on credit supply, risks related to currency mismatch and creditworthiness assessment, and mispricing of risks. The review also identifies the challenges to the exporting profile and therefore the sustainability of the balance of payments of EMEs. Finally, the paper provides some reflections on the limits of domestic private capital markets to bridge the “environmental financial gap”, and calls for the deeper involvement of specialized and official financial institutions.

Keywords: Climate Change, Sustainable Development Goals, Financial requirements, international capital markets, green bonds, sustainable finance

JEL Classification: E44, F64, G23, O13, Q58

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I. INTRODUCTION

Climate Change (CC) has been defined as an existential threat to human life. Though it is difficult to make forecasts, there is consensus that the effects of CC will have substantial impact on standards of living and productive capacity. The IPCC (2018: 264) states that “The mean net present value of the costs of damages from warming in 2100 for 1.5°C and 2°C (including costs associated with climate change-induced market and non-market impacts, impacts due to sea level rise, and impacts associated with large-scale discontinuities) are \$54 and \$69 trillion, respectively, relative to 1961–1990”. Fighting, mitigating and adapting to these challenges require substantial amounts of investment. Emerging Market Economies (EMEs) face a double task in this regard. The economic impact of CC will be stronger in warmer countries, of which the majority is either an EME or a low-income country (IMF 2017). Furthermore, on top of (and to some extent, overlapping with) climate-change related investment (CCRI), EMEs face the task of achieving the Sustainable Development Goals (SDGs), which also requires important investment. This has risen questions about the capabilities to mobilize resources and funding, given the limited domestic capital and financial market that characterizes EMEs (with some notable exceptions).

The question comes about alternative and new funding channels for these challenges, and the dangers these channels may imply. International multilateral organizations such as the International Monetary Fund, the World Bank and the Organisation for Economic Cooperation and Development (OECD) are encouraging the recourse to international capital markets by EMEs as a way to overcome the financing constraints in these economies. New developments in sustainable finance are an encouraging sign, but integration into international financial markets is not devoid of challenges and dangers. The influence of the Global Financial Cycle (GFC) may impede the flow of capital in reasonable terms as required by EMEs.

Furthermore, CC can also have an impact on the productive and trading profile of EMEs, via both physical and transition risks. The specialization in carbon-intensive production such as energy and fossil fuels, risks on agricultural production (such as more frequent draughts, floods and temperature change) and disruption of Global Production Networks (GPNs) rise warnings about the sustainability of the Balance of Payments (BP) of developing countries, in addition to the challenges originated in the

integration to international financial markets as a mean to finance CC-related investment.

Though much has been written about the opportunities and developments in the sustainable finance field for EMEs, there is scant literature on the open economy dimension of the challenges and difficulties faces by EMEs. On a theoretical perspective, the paper closer to our subject is Carnevali et al (2019). We broaden their analysis by examining how current financing alternatives enhance but at the same time endanger the financial capabilities of EMEs to achieve the investment levels and composition required to cope with climate change and the SDGs. The paper is structured as follows. Section II will revise the financial needs for CC and SDGs as estimated by different international bodies. It will also review the literature on the development of new alternatives in the field of sustainable finance with a particular focus on EMEs. Section III puts the focus on international funding channels and the dangers of international financial integration dedicated to CC-related investment. Section IV reflects on the risks and opportunities CC poses for the trade profiles of EMEs. Section V looks at the repercussion on EMEs domestic financial systems.

II. INVESTMENT NEEDS, DISBURSEMENTS AND INSTRUMENTS

Given the uncertain bases on which to estimate the investment required to fight, mitigate and adapt to the different scenarios envisioned by climate change, there are multiple estimations on how much is needed, depending on the projected increase in temperature and the investment gaps that keep accumulating. In 2013, the World Economic Forum estimated USD 5.7 trillion investment per year until 2030 to secure future growth in a 2°C degrees higher scenario. The New Climate Economy Report (GCEC 2014) estimated USD 90 trillion in fifteen years, or around USD 6 trillion per year. The OECD (2017: 28) increased those estimation to USD 6.9 trillion until 2030 to provide for a climate-resilient, low-carbon economy consistent with a 2°C degrees higher scenario (with 66% of probability). In its 2018 1.5° Report, the Intergovernmental Panel on Climate Change stats that “1.5°C-consistent climate policies would require a marked upscaling of *energy system supply-side investments* (resource extraction, power generation, fuel conversion, pipelines/transmission, and energy storage) between now and mid-century, reaching levels of between USD 1.6–3.8

trillion globally on average over the 2016–2050 time frame” (IPCC 2018: 154, italics our own). It should be noted that *actual* investment trends, only considering energy supply-side investment, fall short of the requirements by an estimated USD 0.9 trillion per year.

Investment for climate-change mitigation and adaptation is not delinked, however, from the commitments required to achieve the Sustainable Development Goals (SDGs), within the United Nations 2030 Agenda for Sustainable Development. In fact, the SDG 13 refers explicitly to the urgency to address climate change. IPCC (2018) states that climate change has non-neutral effects on poverty and income distribution. The UN estimated USD 5-7 trillion globally per year to achieve the SDGs (UN 2015, UNEP 2016, 2018). Estimated needs for developing Asia reach USD 200 billion per year (Sachs et al 2019), while Latin America needs to invest USD 175 billion considering only mitigation and adaptation expenditures related to climate change (Abramskkiehn et al 2017: 2).

The OECD, the World Bank and other multilateral institutions (OECD 2019, WB 2018) claim that the magnitude of funding required is far superior to the financial capabilities of the public sector, and it also dwarfs the resources of development banks. In addition, the introduction of Basel III regulations discourages the lending by banks to enterprises and activities with little to no prior record on which to assess riskiness. Also financial stability concerns are raised against prioritizing bank credit as a finance channel. Therefore, these institutions encourage the tapping of private financial markets as a mean to fund climate-change related, “green” investment. And ever since the European Investment Bank (EIB) issued the first labelled “green bond” in 2007 there have been developments in the field of “green finance”, not devoid of fluctuations and volatility.

Gross green bond issuance in 2018 barely increased over 2017 figures, reaching USD 167.6 billion compared to USD 162.1 billion the year before (CBI 2019a). The US and China are the market dominants in terms of amounts issued, and Asia-Pacific is the region that experienced the greater growth rate in terms of issuances, dominating developing countries’ green bond markets. Issuance by Latin American countries stagnated, as well as by African economies. As for the currency of denomination (a major topic to be developed below), the euro, the US dollar and the Chinese RMB concentrate 84% of gross issuance. However, there have been deals in 30 currencies.

When looking at climate finance flows for *new projects*, in 2018 figures fell short of 2017 levels (CPI 2019), falling from USD 612 billion to USD 564 billion. Data by CPI is not necessarily compatible with green bond issuance data, because the proceeds of the latter are not always devoted to *new primary investment (repeated issuers captured 63% of the volume green bonds issued)*, while the quality of reporting needs improvement (CPI 2019, p. 15). With those caveats, the average of climate flows for the years 2017 and 2018 shows that private financing sources indeed represent 56% of the funding, and market-rate debt comprising 54% of the instruments. Public finance is also mainly conducted through Development Financial Institutions (DFIs). Most of the funding indeed is directed towards the domestic economy (75%, according to CPI 2019). In terms of destinations, developing countries received 61% of the financing for new investment projects, with East Asia taking 41% of all climate finance flows (CPI 2019, p. 24). Latin America, Sub-Saharan Africa, the MENA countries and South Asia received each less than 5% of the flows, in the average of 2017/2018. Of international flows, on average between 2017 and 2018 77% of the flows went from OECD to non-OECD countries, increasing 60% in absolute terms versus the average of the two previous years.

Issuance of green bonds recovered substantially in 2019 (CBI2019b). The volatility of the green bond market, when taken into consideration as well the stagnation in 2018, reveals one of the vulnerabilities of climate-related investment: its exposure to global financial conditions, independently of the awareness about the urgency of such type of investment. The tightening of financial markets in 2018 provides a warning about the reliance in private funding for such purposes. The restrictions are not limited to bond markets: supranational entities and DFIs also funded substantial shares of their long-term investment in the bond market, and are therefore affected by spillovers. Green bonds yields suffer from greater volatility than conventional bonds, though rates of return are somewhat below the average of the market (Ehlers and Packer 2017). Furthermore, evidence on green loans on China show that non-performing loan (NPL) ratios are below the average (NGFS 2019). The demand for financing conditions seems to be resilient and does not compare unfavorably to conventional credit demand. Developments in credit supply lag behind in terms of stability, access and risk.

III. INTERNATIONAL FINANCE AND CLIMATE CHANGE

As mentioned before, 75% of the funds for *new projects* is directed towards the domestic economy (CPI 2019). However, the gap with the investment needs surveyed in the previous section called for an engagement with external sources of funding. This call is compounded by the relatively smaller size of financial markets in most EMEs. An additional constraint is the global turn towards market-based funding rather than bank-based. EMEs financial systems are generally oriented precisely towards bank-based finance. Basel III rules discriminate against loans considered “risky”, and the field of renewable energy fits that criteria. This does not imply that there have been no advances in the sphere of “green loans” in EMEs. Standards for green loans were established in Asian and Latin American countries, a useful step for the development of that market. But the orientation fostered by multilateral organizations is towards the integration of international capital markets in the provision of funds for climate-change related investment.

However, this integration is not devoid of risks and costs. Some of these are not exclusively related to “green finance”. The rhythm and pace of financial flows responds to the monetary and financial conditions in advanced markets (notably, the US) more than the state of “fundamentals” recipient countries. In this sense, the supply of finance for climate-related projects is tied to the evolution of the Global Financial Cycle (Rey 2013). The gaps in funding cumulate at an exponential rate. The damage is larger because of specific characteristics of renewable energy projects (Ghisetti et al 2017, NRDC 2016).

The fact that the green bond market is mainly denominated in “hard” currencies is also a well-known factor of risk for EMEs as it creates a currency-mismatch problem, particularly is the benefited projects do not lead to an improvement in the current account balance. This danger is not merely restricted to fully market-based finance. The involvement of National Development Banks (NDBs) and other types of public finance under the strategy of blended finance, as sponsored by the OECD for instance (OECD 2019), also relies on the NDBs and the public sector to take over risks that the private sector refuses to take, thus carrying in its balance-sheet a possible currency mismatch, among other burdens. Public-Private Partnerships (PPPs) also present a potential currency and fiscal burden for the public sector (Gabor 2020). However, the

involvement of NDBs, Multilateral Development Banks (MDBs) and other financial institutions has advantages that will be mentioned further below.

Mispricing of risk and credit rationing or misallocation is further compounded by the identification of environmentally-sustainable projects, the eventual destination of the funding. One of the most disseminated criteria for assessing investment is the Environmental, Social and Governance (ESG) classification. It is estimated that by 2021 ESGs assets will represent around two-thirds of the portfolio of global funds (Nelson 2018, Gabor et al 2019). The certification of green bonds is carried by an increasing number of rating agencies, public and private (Ehlers and Packer 2017). The rating of these bonds and generally ESGs assets is not highly correlated across different agencies for the same projects. In this sense, ESG-label has turned into a speculative valuation practice (Leins 2020), creating risks for “greenwashing”. This creates another channel for mispricing of climate-related risks and misallocation of investment. Capital market lending for EMEs projects is not excluded from this risk.

This feature is a particular manifestation of a more general theme: the type of investor matters for the type of project to be financed, and the general direction of innovation, for instance in renewable energy (Mazzucato and Semieniuk 2018). Environmental innovation has additional risks compared to traditional innovation, like longer maturity, capital intensity, lock-in effects and path dependency (Aghion et al 2014), so that financial restrictions and misallocations can have a lasting impact (Ghisetti et al 2017). Different actors have different portfolios in terms of technologies and risk. The involvement of MDBs also helps to improve the access to credit for riskier debtors and provide a signaling function (Gurara et al 2020). Public investment seems to favor riskier technologies and a larger share of investment (Mazzucato and Semieniuk 2018). Private actors tend to fund low-risk technologies. Different investments and innovations will affect the productive and trading pattern of EMEs.

IV. TRADE AND CLIMATE CHANGE

Climate change may affect the balance-of-payments of EMEs also through the balance of trade, not merely through the financial account. Dellink et al (2017) use a DSGE model developed by the OECD to provide a qualitative and regional assessment of the direct and indirect effects of climate change on trade.

Because of its reliance in sectors with a high level of greenhouse gas (GHG) emission such as transport, trade may be detrimental to achieving the 1.5°C goal. However, the global trade-to-GDP ratio has stagnated in the 2010s, and it is not certain that this relation would rise in the near future. On this account alone, one could say that greenhouse gases (GHG) emission would follow GDP growth trend. However, changes in the composition of global growth may affect the relation between global activity and GHG emissions. While advanced economies seek to decouple economic activity from GHG emission, growth may pick up in countries with less environmental efficiency.

These arguments are related to the impact of trade on GHG emissions. This section deals, however, with the opposite influence. In this regard, Dellink et al (2017) distinguish between direct effects of climate change in terms of physical destruction and transformation, and indirect effects in terms of changes in policies, prices and factors. Direct effects include more recurrent storms, sea level rise (expected from 3 to 6 ft by the end of the century, with great variety by region)¹, deterioration of infrastructure such as roads due to more solar radiation and extreme temperatures, and other factors. These impacts will affect air, land, river and sea-based transport. The impact on inland river-based transport system (either through lower depth levels, or through floods and rising water levels in delta and port areas) will increase transportation costs, production networks and grain transport, among other effects (Curtis 2009). The melting of the Arctic Sea, however, would reduce time and transport costs by opening new routes and redirecting existing ones. On the other side, this may lead to a further concentration of trade between advanced Northern economies at the disadvantage of developing countries, but also Southern and Eastern European countries. An obvious remark goes to the severe impact of increased trade in the Arctic ecosystem.

On the indirect effects front, global warming will have an asymmetric impact in different regions. In tropical countries, temperature will increase leading to lower productivity. Heat, drought and floods will have an impact on agricultural production affecting mainly developing countries. Oil-producing countries will experience a fall in price and demand, if the transition to renewable energy sources is more widespread. Regulatory policies like banning fossil-fueled cars and discouraging short-flights (and favouring train transportation) will also drive down oil demand. On the other hand, temperate and cold regions such as Canada and Northern Europe will increase their land

¹ Lemonick 2010, Kopp et al 2014.

productivity. Crops such as wheat will suffer less favourable conditions in most of the world, but will increase its productivity in Northern America and Europe. In sum, the expectation is that EMEs and Least-Developed Countries with a primary producing based and export profile will experience a deterioration in their balance-of-trade. The opposite is expected to happen to Northern, developed economies. There is of course a high degree of uncertainty in these projections. Regulatory policies and feedback effects will influence the dynamics of the adjustments. Copyright and patent issues, and lock-in effects may deter the access of EMEs (and low-income economies) to new, environmentally-efficient technology (Brown et al 2008).

To muddle through these changes EMEs will need to redefine their productive profile. As reviewed in the previous section, international finance currently falls short of the needs, and also in quality terms. The next section will give a brief outlook to the capabilities of domestic financial systems in EMEs to face this task.

V. DOMESTIC CLIMATE FINANCE IN EMEs: A BRIEF REVIEW

Domestic financial markets in EMEs are predominantly bank-based, and with a lower level of development and deepness than in advanced economies. However, in the last decade corporate indebtedness in EMEs increased substantially (Coppola et al 2020). And as we mentioned before, the largest part of climate finance for new projects (75 per cent) came from domestic sources. In sum, domestic credit increased substantially in EMEs, though two caveats apply. First, the growth in domestic finance is particularly attributed to China and a few more Asian economies. Second, this growth in credit slowed down in the second half of the 2010s, and did not reach levels of credit and developments in financial markets comparable to advanced economies.

On top of having less liquid and developed financial systems, EMEs face further obstacles in their capabilities to finance climate-change related investment. The issue of stranded assets weighs heavily in EMEs. Oil companies in oil-producing countries have a strong relation and account for a large share of bank assets. Movements to decrease the production of fossil-fuels may lead to a deterioration in their market value, lower their financial capabilities and financial demands, and reduce bank profitability. All at the same time that they need to reorient credit to new sectors, accompanying changes in

the productive structure. This effort may lead to deteriorated capitalization with an expanded asset side, increasing financial instability. The public sector has a key role to play in the mitigation of financial risks, with public banks, development banks and specialized banks.

Credit in developing countries also tend to move together with the Global Financial Cycle. Easing credit conditions in international markets translate into higher access by EMEs firms, including banks. Another channel operates through domestic affiliates/subsidiaries of foreign banks. With large requirements of imported content in energy-related investment (particularly in the energy sector), there are risks of growing currency mismatches both in the productive and in the domestic financial sector. Furthermore, domestic finance is not isolated from the GFC. Funding may dry both in the international and domestic market, via rising spreads, exchange rate depreciations and credit tightening.

Just like in the international sphere the role of multilateral bodies, official entities, and development agencies must be increased, a similar need arises in EMEs. Public institutions, specialized banks and development banks will need to step up lending facilities with relative independence of market fluctuations in order to assure a steady and reliable flow of finance to a new and growing sector, until the private banking and financial sector finds it profitable and less risky to expand credit to them.

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