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You can't have your cake and eat it too: why regulatory capital and TLAC/MREL debt instruments can't be authentically "green" (and environmentally conducive), and how to properly factor climate change (and environmental) risks within the components of credit institutions'

Loss Absorbing Capacity stack

May 2022

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You can't have your cake and eat it too: why regulatory capital and TLAC/MREL debt instruments can't be authentically "green" (and environmentally conducive), and how to properly factor climate change (and environmental) risks within the components of credit institutions' Loss Absorbing Capacity stack

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Abstract

Credit institutions' balance-sheet offers a *unique* opportunity for pursuing climate-related objectives. The classic screening and delegated monitoring functions performed by banks place such financial intermediaries in the best position for channeling funds towards carbon-neutral investment projects and correcting prevailing market failures – *i.e.*, by *internalizing* costs that climate change imposes on society. *Green bonds*, by *earmarking* proceeds for environmental-related projects, appear as a perfect means for reaching such targets.

Encouragingly, over the last years Europe has turned out to be a central market for the issuance of green bonds. Yet, as of late several banks have been issuing and classifying green bonds for *prudential soundness purposes*, in their Own Funds and MREL/TLAC capital layers. Such phenomenon gives rise to potential conflicts, as *prima facie* the widely adopted concept of “green bond” is *incompatible* with the financial stability objectives – and loss-absorbing goals – underpinning regulatory instruments' *eligibility criteria*. Bottom-line, green objectives cannot be truly upheld without *undermining* some core features of regulatory capital as well as bail-inable debentures, and vice-versa: In the field of capital definition the issuer has to choose between promoting *environmental* or *prudential* goals; “regulatory green bonds” can in fact either be “regulatory-like” or “green-like”, not both.

This Paper is thus organized as follows: **Section 2** delves into the post-financial crisis *definitions* of regulatory capital as well as MREL/TLAC Eligible Liabilities instruments. **Section 3** analyzes the core features underpinning the notion of green bonds: here utmost attention is dedicated to the recent European Commission's Proposal “for a Regulation on European Green Bonds” – in turn grounded on the EU Taxonomy Regulation – as well as to the other Green Bond framework relevant at the international level, *i.e.* that designed by the International Capital Market Association. **Section 4** explores and details the *incompatibilities* between Own Funds and bail-inable debt instruments *eligibility criteria* on the one hand, and the *notion* of green bond on the other. The investigation will be grounded on *theoretical* grounds, and completed by an evaluation of the *concrete* Terms and Conditions shown by outstanding regulatory green bonds. This Section will also investigate whether green bail-inable debt poses any threat to the No-Creditor-Worse-Off resolution's principle. **Section 5** sets down some proposals for *overcoming* clashes between environmental and financial stability goals in the field of regulatory capital as well as bail-inable debt definitions.

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1. Introduction.

1. From a general theory of law perspective, legal research tends to thrive, quite masochistically, when different regulatory and legislative frameworks *interact* and, possibly, *collide*. *Different* bodies of law (being soft or hard law), by pursuing *different* objectives and goals, may differ when it comes to the treatment of *similar* cases: conflicts and incompatibilities – so called *legal antinomies* – are bound to arise, and legal practitioners and lawmakers face the challenge of providing for some form of *coordination* and, where possible, *coexistence* of conflicting provisions and legal principles.

2. Over the last years, the European bond market has experienced quite massive issuances of so-called *green bonds*, *i.e.* debentures whose proceeds are *earmarked* for environmental-related projects.

In addition to this, European credit institutions have recently started to recognize and elect such bonds either in their Own Funds tier (in the form of *regulatory capital instruments*) or in their MREL/TLAC layer (as *bail-in debt*). The latter is *prima facie* a phenomenon that precisely magnifies the above-mentioned contradictions between provisions, principles and requirements (*i.e.*, eligibility criteria) underpinning different – though simultaneously applicable – legal frameworks.

3. Indeed, and more to the point, the international post-financial crisis regulatory framework is centred on the (macro-prudential) idea of a genuinely *going-concern loss absorbing capital* (*i.e.*, capital that can absorb losses *without* the bank failing) as well as *gone-concern loss absorbing capital* (*i.e.*, debt that can be either written down or converted into equity at an institutions' point-of-non-viability, or in the event of resolution). In turn, such idea is detailed in a series of key features (so-called *eligibility criteria*) that capital instruments' design shall incorporate in order to be *elected* in the relevant regulatory layer. Such features revolve around the (i) permanence; (ii) flexibility of payments and (iii) loss absorbency/subordination characteristics of the financial claims, and they all contribute to define institutions' loss absorbing capacity.

Besides, in the event of resolution, all institution's investors are safeguarded by a series of principles, the most relevant of which being the right to receive a treatment *not worse* than the one they would have received in the – counterfactual – insolvency scenario (so-called No-Creditors-Worse-Off principles, or “NCWO”), and the right to be consequently compensated should this not happen. This means that resolution authorities, when required to allocate losses in resolution, shall rely on a creditor hierarchy as much *aligned* as possible to that applicable in an insolvency proceedings: this is paramount if they want to thwart any NCWO breach from arising. Avoiding the prospect of NCWO breaches is all the more important for Resolution Authorities, as such violation could result in an *impediment to resolution*. One may wonder though if NCWO violations may *only* be brought about by differences in the relevant creditors' hierarchy respectively applicable in resolution and insolvency proceedings, or in fact certain

green-related features, when incorporated in a bail-inable debt, could entail the *same* risk.

4. Against this backdrop, though in the absence of binding legislative texts on green bonds features and design, a number of soft-law instruments (and more recently, at the EU level, the Commission's Proposal "for a Regulation on European Green Bonds") have, over the years, provided for a set of criteria that underpin the *definition* of green bond. A key element in such definition is the notion of green bonds as notes the proceeds of which are *meant to be invested in green assets* – and possibly, *segregated* from the other assets of the institution –. Crucially, as we will appreciate, such characteristic does *collide* with several criteria for including debentures in the regulatory capital as well as the MREL/TLAC layers – namely, concerns may be raised in relation to *permanence* and *loss absorption* prudential eligibility criteria. Equally, *significant* issuances of (genuine) green bonds may give rise to NCWO breaches (and consequently, impediments to resolution), an outcome that, as per above, is due to an *inherent conflict* between a *properly design* green bond (*i.e.*, a note capable of truly promoting green objectives) and *effective* bail-in able debts (*i.e.*, instruments capable of smoothly promoting resolution objectives). In conclusion, the *link* between the bonds and the green assets appears to be, from a regulatory and prudential policy perspective, a *critical point* in the green features of such instruments, so that one may wonder whether Own Funds and MREL/TLAC tiers are *not* the most suitable layers for issuing green bonds and for factoring green commitments, being that green objectives cannot be truly upheld without *undermining* some core features of regulatory capital as well as bail-inable debentures, and vice versa. Put it differently, one may wonder whether regulatory green bonds issuances are properly and effectively "green" or if, in fact, in order to be elected and recognized for prudential soundness purposes, they have to forgo (*i.e.*, "green-wash") some of the characteristics underpinning the definition of green bonds – and, in doing so, *failing* to promote their green objectives.

5. This paper is thus organized as follows: Section 2 sets down the main elements and objectives underpinning the Basel III as well as CRR definition of (regulatory) capital. Attention will be drawn to the criteria underlying capital instruments' election at the AT1 as well as Tier 2 level, being these the regulatory capital tiers favoured by institutions so far for the issuances of green/regulatory bonds, as we will examine in Section 4. Section 2 then analyses the main criteria shaping the definition of Eligible Liabilities instruments for MREL/TLAC objectives (enshrined within the FSB TLAC Standard and the CRR framework, as recently overhauled by the CRR II): as per above, such analysis finds its importance in the recent issuances by EU institutions of green debentures for MREL objectives, so that it will pave the way for the enquiry undertaken in Section 4. Section 3, after having explored the economic – and financial stability – rationale for supporting the promotion of *climate change-related goals* via financial institutions' balance-sheet, delves into those standards and principles, enshrined in different pieces of legislation, that provide for a *specific design and definition of green bond*. As we will see "*the cornerstone of a green bond is the utilisation of the proceeds of the bond for green projects*". Section 4

then addresses the *inherent contradictions* stemming from a *coherent* and *combined* application of the prudential eligibility criteria on the one hand, and the green standards for green bonds on the other. The capability of Own Funds and MREL/TLAC legislation to accommodate authentic *climate change* and, more generally, *environmental commitments* – in the form of green bond recognition in the relevant prudential capital layers – is here challenged not only on *theoretical grounds* (*i.e.*, showing the inconsistencies running between several prudential eligibility criteria and the definition of “green bond”), but it is also *tested* on more *pragmatic basis*, by investigating whether the concrete design of some recent green bonds issued by EU institutions for prudential purposes is really *environmentally conducive* or, in fact, in order to accommodate such regulatory objectives, it had to forgo some *authentic* and *crucial* green features.

Finally, while the previous Sections represent the *pars destruens* of the paper, the last Section aims at proposing possible solutions for overcoming the drawbacks brought about by the election of green claims within the prudential tiers. As it will be scoped out, on the one hand, solutions capable of *aligning* capital instruments eligibility requirements with green features seem to exist, despite narrow headroom. On the other hand, and more generally, if truly promoting green goals via Own Funds and bail-inable instruments proves to be out of reach, we will try to propose possible *remedies* for getting institutions capital structures more sensible to, and “aware of”, climate change (and environmental) concerns.

Optimistically, the analysis and conclusions drawn in this Paper, by clarifying *when* (and *when not*) bonds issued for prudential purposes could also serve green objectives, shall *guide* credit institutions in building a capital structure capable to fulfil macro-prudential (*i.e.*, loss-absorbing) aims, without undermining environmental concerns (and vice-versa).

2. *The post global financial crisis definition of capital: the emphasis on the going-concern loss absorbency capacity of regulatory capital.*

It is often stated¹ that one of the main lessons to draw from the 2008 Global Financial Crisis is centred on the overall *inadequacy of credit institutions’ capital base*. Since several of the ailing banking and financial groups that were rescued via public spending reported, ahead of being bailed-out, capital requirements *well above* the Basel II 4% Tier 1 requirement, the argument goes, *then* the *quantity* and level of minimum capital necessary to prevent – or to orderly manage – financial institutions’ insolvency and absorb unexpected losses were not sufficient. In fact, the issue is quite more *complex*, and it requires

¹ See Cahn and Kenadjian (2014), p. 21. See also Baltali and Tanega (2011), p. 15, where it is reported how Lehman Brothers, fifteen days ahead it filed for insolvency, disclosed to the market a Tier 1 *ratio* amounting to 11% of its risk-weighted assets.

to take into account both the *quality* and the *composition* (i.e., the *definition*) of the regulatory capital tiers².

Understanding *what counts* as regulatory capital³ is actually crucial for assessing the prudential (in)adequacy of the capital base, as it is understanding what do we talk about when we talk about firms' *loss absorption capacity*: indeed, under a *first interpretation*, institutions' loss absorption capacity refers to the capacity of the capital resources – either instruments or non-instruments capital items – to absorb losses on a *going-concern basis*, i.e., as soon as they arise, thereby reducing the *likelihood* of insolvency. Quite differently, under a *second interpretation*, the loss absorbing capacity entails protecting *certain* classes of bank's creditors (typically, depositors) against losses only once the bank is in *insolvency*, but without offering a cushion to withstand losses outside and before insolvency (*gone-concern* loss absorbing capacity).

One can grasp how the going/gone concern *dichotomy* is so paramount, influencing the prudential *composition* – and *definition* – of the capital base, since there is only a very *restricted class of items* (and capital instruments) capable to protect banks against sizeable and unexpected losses *without* the need to file for an insolvency proceedings, namely *shareholders' funds/equity* as well as *equity-like capital instruments*⁴.

The pre-financial crisis prudential framework (a) did not really focus on such crucial dichotomy when it had to define the *mandatory level* and *quality* of the capital base and, (ii) it excessively relied on subordinated debt – and similar gone-concern claims – in drawing the boundary of the regulatory capital stack. It thus disregarded the macro-prudential concern⁵ whereby, in the event of a systemic crisis, the overarching objective underpinning the regulatory framework should be keeping the *overall* financial system *functioning* – mainly via the build-up of *enough going-concern loss absorption capacity* in the system –, rather than ensuring an *orderly liquidation* of the individual ailing banks and protecting certain senior creditors– via the write-off and conversion of gone-concern, subordinated claims –. And, since governments during the financial crisis proved *unwilling* to allow financial institutions to undergo

² In this respect, see Baltali and Tanega (2011), § 2 and footnote 37; Richardon and Stephenson (2000), pp. 27 ff.; Cahn and Kenadjian (2014), p. 2 and Armour et al. (2016), pp. 305 ff. Such ideas were already enshrined in the banking literature of the -mid twenty century, see Short, (1978), p. 530.

³ Regulatory capital is a *broader concept* than “capital”, as defined by company laws (i.e., share capital), or “equity”, as defined by accounting standards. Regulatory capital can indeed include certain liabilities instruments (Tier 2 subordinated debt), while *additional criteria* are applied to share capital and other capital instruments in order to qualify as such. Besides, despite being *accounting equity* in most cases the *main component* of regulatory capital, the aims of prudential regulation, characterized by a forward-looking, *safe* and *sound* approach, differs from accounting goals – whose main objective is to give investors a *true & fair view* of the state of the firm as a going-concern. Therefore, accounting equity is usually *adjusted* (via filters and deductions) for regulatory capital purposes. Regulatory adjustments mainly aim at (i) reducing *contagion risk* or *double-counting* of capital within the system; (ii) getting rid of assets that are likely to *not* provide any loss absorbing capacity (i.e., they are worthless) in stress and (iii) remedy for any accounting anomalies.

⁴ See Joosen (2015).

⁵ The idea that Basel II did not fully consider macro-prudential objectives in setting down its prudential framework is widespread. See Drumond (2009); Repullo and Suarez (2013) and Financial Stability Board (2009). For a partial defence of the Basel II architecture, arguing that it should not be blamed for failing to tackle the Global Financial Crisis, simply because at that time it wasn't fully in place, see Cannata and Quagliariello (2009).

insolvency procedures, the gone-concern capital cushion offered *no* loss absorbing capacity *at all*: accusing financial institutions to have entered the crisis *thinly capitalized* – as per the claims reported in the opening of the Section –, is only *half true*, as such charge should be accompanied by an analysis of the *quality* of the *resources* used to count against the minimum capital requirements.

Building on these weaknesses, and with the aim to support financial institutions as going-concern entities in the face of shocks, the post-financial crisis regulatory framework (*i.e.*, Basel III⁶ and its European transposition, the CRR-CRDIV Package⁷, the latter being our main legislative reference in the following pages) has responded by: *(i)* increasing the *minimum* capital requirements and *altering* the *composition* of the regulatory minima⁸ and, more importantly, *(ii)* taking a *stricter approach* in *defining* the “quality” that capital resources have to provide for their *prudential recognition*. Within the new prudential framework(s) high capital is meant to be delivered via *truly* and *effective loss absorbing capital instruments and resources* – so called Own Funds –, and the design of such regime now clearly takes into account the “going/gone-concern” dichotomy.

The second point above is of utmost importance for the objectives of this work, and it thus requires further scrutiny. The Basel III/CRR minimum capital requirement is made up of *three components* (already mentioned above, under note 8), the Common Equity Tier 1 (“CET1”) and Additional Tier 1 (“AT1”) layers (which comprise the regulatory Capital Tier 1) and the Tier 2 layer. For each of these three categories⁹, the prudential legislation has established a set of *criteria* that capital/debt instruments

⁶ See BCBS (2011).

⁷ Respectively *(i)* Regulation (EU) No 575/2013 and *(ii)* Directive 2013/36/EU.

⁸ The regulatory capital stack is now structured as follows:

(a) A Pillar I minimum capital requirement, at least equal to the 8% of the Risk-Weighted Assets of the institution – CRR, Article 92 – of which: *at least* 4.5% shall be composed of CET1 items (against the 2% required under Basel II), with the remainder that could be made up of Tier 2/subordinated debt items – though for an amount not higher than the 2% – and Additional Tier 1 instruments. The *mandatory design* required to capital instruments for being classified under such tiers will be further detailed in the text.

(b) A discretionary Pillar II capital add-on – CRDIV, Articles 97-98 –, designed to cover those risks not, or not entirely, covered under the Pillar I framework. Such Pillar is predominantly composed of CET1 items.

(c) Several *additional capital buffers*, to be met *only* via CET1 resources, designed to be built up outside period of stress, and to be released as soon as losses are incurred (so called “buffer usability principle”) in order to guarantee the *continued operation* of the institutions – though drawing down the buffers would trigger *distribution constraints*. These buffers aim to capture system-wide risks and are thus essentially *macro-prudential in nature*. Basel III and the European framework introduced *three* specific buffers, and namely: *(i)* the Capital Conservation Buffer – CRDIV, Article 129 –, a static buffer that applies to *all* banks *all* the times. It requires firms to hold CET1 equal to 2.5% of their RWAs, and it is designed to be dipped into in the *downside* of the economic cycle, *preserving bank’s regulatory minima* from absorbing losses in period of stress, and thus dampening the consequences of the downturn on bank’s lending activity; *(ii)* the Countercyclical Capital Buffer– CRDIV, Articles 130, 135 and ff. –, that could be applied to *some* or *all* institutions in *specific* time; namely during an *economic upswing*. The buffer is intended to curb *pro-cyclicality*, *i.e.* the *reinforcing feedback loop* between the financial cycle and the risk-weighted prudential requirement during the *boom-phase* of the cycle by constraining lending, thus alleviating the consequences on the bank’s balance sheet and on the real economy of the *bust-phase* of the cycle; *(iii)* the Global Systemically Important Bank buffer– CRDIV, Article 131 –, that targets the firms *systemic footprint* and aims to reduce the probability of systemic banks defaulting or entering distress, in line with the increased impact this would have on the global economy. In addition, the European framework has added one more buffer – CRDIV, Article 133 –, the Systemic Risk Buffer, to address risks related to Domestically Systemic Important Banks, which can be used to mitigate long term non-cyclical macro-prudential risks not covered by other tools in the CRR-CRDIV.

⁹ It is worth reminding here that the whole regulatory minimum could be met via CET1 resources *alone* – *i.e.*, firms are not required to structure their funding profile through funds acquired via AT1 and Tier 2 issuances.

are required to meet before *inclusion* in the relevant prudential class. Each of these criteria touches different *features* of the instruments, by focusing on those features that most contribute in delivering the *loss absorption objectives* underscoring the capital regime. As we will appreciate, it is exactly at the level of these *eligibility criteria* that the *peculiar features* of green bonds give rise to conflicts and contradictions, so that a general overview of such prudential criteria is necessary¹⁰. In a nutshell, the current prudential framework expects from Own Funds instruments¹¹ *specific characteristics* in term of (a) permanence; (b) flexibility of payments and (c) loss absorbency (*i.e.*, subordination and exposure to losses features, and rights in liquidation).

CET1 instruments, mainly *ordinary shares* and other *equity-like capital instruments*¹², are considered the regulatory capital's *highest quality component*, and are expected to: (a) be *perpetual*, and lacking any contractual *put* or *redemption option*¹³; (b) not give rise to any *dividends/distribution rights* (*i.e.*, such payments should be *fully discretionary*)¹⁴ and (c) absorb *operating losses first*; be the most deeply subordinated form of capital and have the same entitlement to any residual assets in the company's liquidation¹⁵.

While in the current regulatory framework the CET1 layer and ratio are by far the most relevant indicator for assessing bank's capitalization, being CET1 resources necessary for meeting the regulatory minima, the following Sections will mainly deal with *debt-like green claims*, so that an analysis of the two prudential tiers that enable the recognition of *debentures*, the AT1 and Tier 2 layers, is needed. In this respect, AT1 instruments (mainly *contingent convertible instruments*) are expected to: (a) not have any *maturity date* and contain any *indication/expectation* that the instrument will be redeemed at a specified time¹⁶ (except for call options); (b) provide firms with a *full discretion* to cancel coupons/dividend payments; and such cancellation shall impose no obligation on the firm¹⁷ and (c) be written down/converted in full and *permanently*¹⁸ at a specified *trigger* – which should be at least equal to the

¹⁰ A more detailed analysis of such criteria – *rectius*, of those of interest for the purpose of this work – will be carried out under Section 4, as we will delve with greater scrutiny into the clashes between Own Funds and green bonds respective key features.

¹¹ *Rectius*, the Terms and Conditions of the Prospectus – and where relevant, the company's article of association – shall regulate the claims of the instruments' holder over the firm *in line with* the characteristics immediately detailed in the text.

¹² The CET1 comprises, in its non-capital instruments component, (i) retained earnings; (ii) other comprehensive income and (iii) other reserves, but only, “*where they are available to the institution for unrestricted and immediate use to cover risks or losses as soon as these occur*”. See CRR, Article 26(1).

¹³ CRR, Article 28(1)(e) and (g). *Discretionary* reductions in CET1 capital may be pursued, at the sole discretion of the issuer, conditioned on the approval of the Competent Authority, under the CRR *redemption approval regime*.

¹⁴ CRR, Article 28(1)(h)(vi).

¹⁵ CRR, Article 28(1)(i) and (j).

¹⁶ CRR, Article 52(1)(g). Besides, any *discretionary* reduction in AT1 capital must be triggered at the sole discretion of the firm, subject to a prior Competent Authority permission – CRR, Articles 77-78 –, and the instruments should not contain any *incentive to redeem clause or mechanism* – such as interest rate step-ups, see CRR, Article 52(1)(g).

¹⁷ CRR, Article 52(1)(l)(iii) and (iv).

¹⁸ *Temporary* cancellation/conversion is admitted, under the conditions specified by the Commission Delegated Regulation 241/2014, Article 21(2).

5.125% CET1 *ratio* of the firm¹⁹–, and finally, rank below Tier 2 instruments²⁰. In turn, Tier 2 instruments (mainly *vanilla debt instruments* and, to a less extent, *preference shares*) are expected to: (a) have an original *maturity date* of at least five years²¹; (b) *not necessarily* provide the issuer with some form of flexibility over coupon payments – *i.e.*, interests not paid may constitute an event of default – and (c) be subordinated to all *eligible liabilities instruments*²² (a prudential class over which we will come back in a while).

As already pointed out, one can appreciate how essentially *every feature* that contribute to define each prudential layer is *teleologically oriented* in strengthening the *loss absorption objectives* underpinning the regulatory capital’s concept: *permanence* and *full flexibility of payment* criteria complement the *loss absorption* criteria, by *limiting* to the much extent possible any *outflows of financial resources* from the firm towards external as well as internal stakeholders – this is crystal clear as per the full discretion granted to the firm over dividends payment: retained earnings are indeed positive CET1 items and thus support the building up of capital.

Despite such clear-cut objectives, the increase in the quality and quantity of capital is *not* tantamount to a *zero-failure outcome*, so that over the years special mechanisms and procedures for dealing with banks failures – and their, at times, devastating consequences over financial stability - have been established. This is in a nutshell the core rationale lying at the basis of the recently introduced resolution frameworks²³, whose main aim is to replace any too-big-to-fail subsidies and public support expectations with a system of private penalties, by entrusting Resolution Authorities with “*a credible set of tools to intervene sufficiently quickly in an unsound or failing institution*”²⁴.

An analysis of the components, functioning and *principles* underscoring such regimes is not possible here²⁵. Still, there are *two* of those principles that are worth investigating for the purpose of this work: the *first* is the so-called *burden-sharing principle*, *i.e.*, the idea that losses stemming from bank failures should be born *first* and *primarily* by banks’ *equity-holders* and (certain) *creditors*²⁶. The resolution tool which mostly brings about such overarching principle is the *bail-in tool*²⁷, by entrusting resolution

¹⁹ CRR, Article 54(1)(a)(i). Pursuant to Article 54, issuers may decide to establish (i) trigger higher than 5.125% and/or (ii) additional triggers, next to the mandatory 5.125% minimum. As we will appreciate further under Section 5, the possibility to design *green/climate-related trigger events* falls under this Article.

²⁰ CRR, Article 52(1)(d).

²¹ CRR, Article 63(1)(g). Any discretionary reduction in Tier 2 capital must be at the *sole discretion* of the firm and subject to a prior Competent Authority permission – CRR, Article 77-78 –, and the instruments should not contain any incentive to redeem clause or mechanism, as per CRR, Article 63(1)(h).

²² CRR, Article 63(1)(d).

²³ The key attributes of effective resolution regimes for financial institutions have been laid down, at the international level, by the Financial Stability Board in the 2011, then revised in the 2014; see Financial Stability Board (2014).

At the European level, an analogous framework has been established by the Directive 2014/59/EU (so-called “BRRD”) and, for systemic institutions operating in the Eurozone, by the Regulation (EU) No 806/2014 (so-called “SRMR”).

²⁴ BRRD, recital 5.

²⁵ Academic literature covering resolution regimes is wide. *Inter alia*, see Binder (2015) and (2019); Thole (2014) and Cihak and Nier (2009).

²⁶ BRRD, Article 34(1)(a) and (b).

²⁷ BRRD, Articles 43, 44 and 46 to 58. The bail-in tool has been widely analyzed in the academic literature. See *inter alia*,

authority with the power to *write-down* capital instruments and liabilities as well as *convert* contingent capital and debt instruments into equity, to an extent sufficient for restoring the minimum regulatory capital level of the institution (recapitalization actions are pursued only whereby the goal of the resolution procedure is to allow the institution to keep operating on a going-concern basis, as its systemic footprint would not permit an orderly liquidation). But, for authorities and market to have *confidence* that banks are resolvable via this balance-sheet and purely accounting operation, “*they must have confidence that these firms have sufficient capacity to absorb losses, both before and during resolution*”²⁸. This in turn has fed into a new *requirement* for institutions to have a *sufficient amount* of instruments and liabilities *readily* available for bail-in in resolution: the so-called TLAC and the – *substantially equivalent* – MREL requirement²⁹.

While the calibration of the *minimum* quantity of TLAC/MREL capacity may coincide with the regulatory capital minima (and this is usually the case for banks whose preferred resolution strategy is *liquidation*), banks may be required to build up *extra* TLAC/MREL capacity, over and above the regulatory minima (and this is usually the case when banks are meant to be *recapitalized post-resolution*). Resolution frameworks allow firms to meet such extra capacity via instruments that not necessarily fall within the Own Funds categories and criteria analyzed above, but whose mandatory characteristics – *i.e., eligibility criteria* – resemble those of *Tier 2 instruments*, being similar the goals they are supposed to achieve (*i.e., providing for loss-absorbency on a gone-concern basis*): the so-called “Eligible Liabilities instruments”. Though eligibility criteria for the two differ in some respect (but differences are more subtle when it comes to the European transposition of the concept, under the new CRR, article 72*b*), for the purposes of this work we only need to point out that the main rationale underlying this new prudential layer is to *absorb losses during a resolution proceeding*³⁰, so that each eligibility criterion aims at promoting such objectives – alike criteria for including notes into the Own Funds components.

More to the point, and similarly to the rationale underpinning the qualifying criteria of regulatory capital instruments, eligible liabilities’ definition revolves around (*a*) minimum maturity requirement, to ensure that the resources obtained are still available when needed, namely in a stress scenario³¹ and (*b*)

Joosen (2014); Gleeson (2012) and Zhou et al. (2014).

²⁸ Financial Stability Board (2015), p. 3.

²⁹ The TLAC framework has been introduced at the international level by the Financial Stability Board, see Financial Stability Board (2015). A substantially equivalent framework – the MREL standard – was first introduced in the European legislation by the BRRD. Such framework has been recently widely revised by the BRRDII (Directive 2019/879) and the CRRII (Regulation 2019/876), which have introduced a TLAC requirement for systemic banks (CRR, Art. 92*a*), while the MREL standard keeps applying to all the other non-systemic institutions. For the purpose of this work, we will only focus on the notion of “Eligible Liabilities instruments” set down by the CRR, Articles 72*a* and ff., which may be issued by institutions for meeting both their MREL or TLAC requirements, with *negligible* differences on the configuration of such instruments according to the requirement applicable.

³⁰ Exception being *internal* MREL instruments, which by definition are required to absorb losses before a resolution proceedings has been initiated, though they are not of any relevance here.

³¹ Under the new CRR, art. 72*b*, eligible liabilities instruments shall have an original maturity of at least one year (few

subordination requirement – which will be discussed in a while³². Similarly to Tier 2 instruments, and thus reflecting the legal status of “debentures” of such instruments, *no flexibility and discretion* is required in terms of coupon payments, meaning that non-payment could amount to an event of default. But subordination requirements need to be further detailed here, as they would bridge us towards the *second* relevant principle underpinning modern resolution frameworks, the NCWO principle. Eligible liabilities instruments are indeed required to be subordinated, within the relevant insolvency hierarchy applicable to the firm, to a group of so-called *excluded liabilities* - which for the most part coincide with those *operational liabilities* statutorily exempted from the application of the bail-in tool³³. The need to have Eligible Liabilities instruments absorbing losses in insolvency *prior to* excluded liabilities stems from the fact that the “bail-in sequence” (the order in which different instruments shall be written down or converted in a resolution scenario) should *not depart* too much from the one established by the *ordinary insolvency hierarchy* applicable to the failing bank, being the former an *alternative* to the latter³⁴. The necessity to respect in a resolution procedure to the greatest extent possible the ordinary insolvency ranking is so paramount that resolution framework provides creditors with a *right to compensation* whereas they have to bear in resolution an amount of losses higher than those they’d have been subject to in a liquidation of the firm, under the applicable insolvency regime.

One could see now why eligible liabilities are mandated to be *junior* to excluded liabilities: absent such requirement, risks of successful legal challenges and compensation costs due to NCWO breaches with respect to eligible liabilities (ranking *pare passu*, if not senior, to excluded liabilities within the ordinary insolvency hierarchy) would be *material*, as eligible liabilities may be called to absorb a share of losses in resolution *higher* than in *liquidation*, as in the *latter scenario* losses would also be allocated on excluded liabilities, contrary to the resolution one. In conclusion, this leads us to understand why, should NCWO breaches be *likely* in a resolution procedure, Resolution Authorities may identify in such risk an *impediment to resolution*. Could *green-Eligible Liabilities instruments* be posing material threats of NCWO breaches, and thus prompting Resolution Authorities to take such a penetrating decision? This is one of the questions the Paper will try to address in the coming Sections.

limitations are imposed to the presence of put and call options in the Terms and Conditions of the instruments, despite buy-backs and redemptions are subject to the approval regime regulated under CRR, Articles 77-78).

³² Under the new CRR, art. 72b eligible liabilities instruments shall be *subordinated* to a class of well-defined liabilities excluded from the bail-in measure (so-called excluded liabilities, defined under CRR, Art. 72b(2)), for which see immediately in the text.

³³ CRR, Art. 72b(2).

³⁴ The argument lies on the observation of how disruptive could it be on market confidence the application of different rankings and priorities, depending on the procedure opened (ordinary bankruptcy *vis-à-vis* resolution proceedings). See Lamandini and Munoz, (2016), p. 3.

3. *Treating climate change (and, more broadly, environmental risks) as financial risks: the case for “green” bonds and their recognition at the European and international level.*

As an adamant Enlightened environmentalist recently put it, a *scientific* approach to environmental concerns should “offer a constructive alternative to the radicalism [these concerns] encourage”, grounded on “the key idea that environmental problems, like other problems, are solvable, given the right knowledge”³⁵. A core insight of this Section is that credit institutions, by performing their *projects selection* and *monitoring functions*, and given appropriate incentives (necessary for *aligning* private and social costs), may provide the “right knowledge” for dealing with a particular kind of environmental risk, *i.e. climate change-related risks*. More to the point, such outcome may be reached via the issuance of so-called *green bonds*. But first things first.

There seems to be by now a worldwide consensus in considering *alarming* the effect of greenhouse gases on the Earth’s climate³⁶: every time coal, wood, oil or gas is burnt, the carbon in the fuel is oxidized to form carbon dioxide [CO₂], which in turns floats into the atmosphere: 38 billions of CO₂ are dumped annually in the atmosphere, as the concentration of CO₂ in the atmosphere has risen from roughly 270 parts per million in the pre-industrial revolution period to more than 400 parts today. The higher the CO₂ blocked in the atmosphere, the more the heat radiating from the Earth’s surface is trapped, contributing in turn to the *upsurge* in global average temperatures (which are now 8° Celsius higher than pre-industrial level). It has been estimated that, unchanged the current trend, Earth’s average temperature will rise to at least 1.5° Celsius above pre-industrial level by the end of the 21st century. Now, as one might guess, a rise in temperature could translate into “*more frequent and more severe heat waves, more floods in wet regions, more droughts in dry regions, heavier storms, more severe hurricanes, lower crop yields in warm regions, the extinction of more species, the loss of coral reefs (because the oceans will be both warmer and more acidic), and average rise in sea level of between 0.7 and 1.2 meters*”³⁷. Bottom-line, being a rise in 2 C° considered the limit the world could adapt to by the end of the 21st century, greenhouse gas emission *reduction* and *decarbonization* should be pursued: namely, greenhouse gas emission should be halved by the middle of the 21st century and eliminated altogether before the beginning of the 22nd³⁸. Against this backdrop, the 2015 Paris Agreement aims at limiting the rise in global average temperatures at 1.5 C° above pre-industrial level. Also (and accordingly), the Paris climate goals include, as one of its three main objectives, the need to make “*finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development*”³⁹.

³⁵ Pinker (2018), p. 121.

³⁶ The data that will follow in the Section as well as the narrative adopted is mainly taken from Pinker (2018), pp. 136 ff.

³⁷ Pinker (2018), p. 137.

³⁸ See Intergovernmental Panel on Climate Change (2014); Nordhaus (2013) and World Bank (2012).

³⁹ United Nations (2015), article 2.1.

How such scenarios could affect *financial sector activities and business models* – and via these channels, the overall financial stability – is all the more straightforward: climate change may have significant impact on the economy (and the effect of the above-mentioned climate-related disasters are easy to gauge for sectors like tourism; energy and construction). Such climate change-related risks may in turn amount to as many potential *climate-sensitive exposures* of the financial sectors, *i.e.*, *transmission channels* of climate change-related risks to the overall financial stability⁴⁰. On the other hand though, financial sector actors – and particularly, banks –, due to their *intrinsic* functions and characteristics, are well placed for *paving the way towards a carbon-neutral economy* (provided that they are also given right incentives for a correct pricing and representation of climate risks in their balance-sheets).

Financial intermediaries are indeed considered to perform a crucial function in the *channeling* of funds to the real economy, by *selecting* and *monitoring* on behalf of the lenders (*i.e.*, their clients, usually depositors and bondholders) those (entrepreneurial) projects that most deserved credit – so called *delegated monitoring function*⁴¹. Still, this may not yet be enough for ensuring the channeling of funds towards *carbon-neutral* business projects or, put it differently, banks' investors may not be in a position to *track* and *trace effectively* whether their funds are mobilized for funding sustainable investments, and this is due to another well-known phenomenon characterizing financial intermediation, that is the *opacity* afflicting banks' balance-sheet composition⁴².

The issuance of green bonds may offer a solution to such drawback and, in doing so, improving financial intermediaries' *ecological performance*⁴³. Indeed, the *major idea* underlying green bonds is the *obligation*, placed upon the issuer, to *match* the *proceeds* of the bond with *green assets* on the bank's balance-sheet. As it could be argued, such sort of “segregation tool” may empower investors to effectively *monitor* and *track* whether the funds raised and pledged towards sustainable projects are paired with a *green portfolio* on the asset side of the bank's balance-sheet. In principle, this should promote *transparency* and stifle *opacity* practices.

A *binding definition* as to what constitutes a green bond issuance (*i.e.*, when and under what conditions a project could be considered as “green”) is *still lacking*. Nonetheless, common and *widely adopted bases* for the green label are to be found (*a*) in the 2018 International Capital Market Association “Green Bond Principles” (hereinafter “ICMA GBPs”), and (*b*) at the EU level, in the 2019 and 2020 TEG Report

⁴⁰ In the economic literature, climate risks posing a threat to financial stability are usually divided into (*i*) *physical risks*, that relate to the possible economic costs stemming from the *erosion* in value of financial/material collaterals, and/or the increase in liabilities, due to the magnitude/frequency of climate change-related events; and (*ii*) *transition risks*, that relate to the possible *reassessments* of the value of financial sector's assets and liabilities due to the process of *migration* towards a low-carbon economy as well as material changes in environmental regulation. See Schnabel (2020); Giuzio et al. (2019) and Caldecott et al. (2014).

⁴¹ See Armour et al. (2016), pp. 284 ff.

⁴² See Morgan (2002) and Iannotta (2006).

⁴³ This statement should be taken *cum grano salis*: for an analysis showing that green bond labels are not necessarily associated “*with falling or even comparatively low carbon emission at the firm level*”, also considering that “*green labels apply to standalone projects rather than to the firm's overall activities*”, see Ehlers et al. (2020).

Proposal and Usability Guide for an EU Green Bond Standard and finally in the 2021 European Commission Proposal for a Regulation on European Green Bonds (hereinafter “EuGBs”), the latter two explicitly drawing on the EU Taxonomy Regulation. Namely:

(a) The ICMA GBPs are so-called “voluntary process guidelines”, thus belonging to the *soft-law realm*. Put up by private financial institutions under the aegis of the ICMA, they rest on *four key pillars* as per what the *essential components* of a green bond issuance are: (i) the *use* of proceeds; (ii) the *process* for projects evaluation and selection; (iii) the *management* of proceeds and (iv) *reporting*. Of these core components, only (i) and (iii) are of relevance for the purposes of this Paper⁴⁴: Principle (i) sets down the cornerstone over which the green bond definition is grounded, *i.e.*, the *need* to utilize the funds raised via the bond for *financing* – or re-financing – *green projects* (whose environmental benefits shall be clearly listed and, where feasible, quantified). The eligibility categories in which green bonds may fall are quite broad, and, among those categories contributing to environmental objectives, the GBPs detail *climate change mitigation and adaptation*. Principle (iii) strengthens Principle (i), by requiring the issuer to put in place processes for *tracking* – and, possibly, *segregating*, though such wording is never adopted in the GBPs – the net proceeds of the green bonds. Besides, such proceeds are to be managed in a way that “*the balance of the tracked net proceeds should be periodically adjusted to match allocations to Eligible Green Projects made during that period. The issuer should make known to investors the intended types of temporary placement for the balance of unallocated net proceeds*”⁴⁵. Introducing a jargon that will be detailed in the next Paragraph, the overall idea emerging from the ICMA principles is that proceeds raised from green bonds should not be considered “*fungible*” with other firm’s assets.

(b) While still lacking an uniform Green Bond Standard at the EU level, such Standard has repeatedly surfaced on the EU Agenda over the last years: (i) recommended in the 2018 Final Report of the Commission’s High-Level Expert Group on sustainable finance⁴⁶; (ii) set out as an “action” to take in the 2018 Commission Action Plan on Financing Sustainable Growth⁴⁷ and finally (iii) detailed, as a proposal, by the Commission’s Technical Expert Group (TEG) on Sustainable Finance both in its 2019 recommendation for an EU Green Bond Standard⁴⁸ and in its 2020 Green Bond Standard Usability Guidance⁴⁹. As of very recently, and building on the TEG’s work, the Commission has finally published

⁴⁴ While Principle (ii) requires the issuer of the green bond to put in place processes for *communicating* investors (a) the environmental objectives underlying the issuances; (b) the procedure adopted for determining how projects fit within Green Projects categories and (c) the green eligibility criteria, Principle (iv) mandates the issuer to report annually on the use of the proceeds as well as provide an annual list of projects to which proceeds are allocated. Both principles help strengthening *transparency* and *accountability* goals.

⁴⁵ International Capital Market Association (2018) § 3.

⁴⁶ European Commission (2018a), pp. 30 ff.

⁴⁷ European Commission (2018b), see “Action 2”.

⁴⁸ European Commission (2019).

⁴⁹ European Commission (2020).

its Proposal for a Regulation on EuGBs⁵⁰ – over which the following lines will be based on.

The difference between the 2019 and 2020 TEG’s recommendation as well as the Commission’s Proposal for an EuGBs lies in the fact that the latter two are grounded on the new EU classification system to determine whether an economic activity is *environmentally sustainable* – the so-called “EU Taxonomy”⁵¹ –, and it thus specifically aligns the use-of-proceeds (and the “green bond” notion) with such Taxonomy for clarifying and identifying when a project could be considered a “green project”⁵². In the words of the Commission, setting a Standard for “high-quality green bonds”, should promote both transparency practices and issuers’ accountability, thus overcoming the phenomenon of “balance-sheet opacity” underlined above⁵³.

The building pillars over which the Commission’s Proposal is built do not differ in substance from that embraced by the ICMA GBPs, in the sense that the Proposal adopts an “use-of-proceeds” approach too in depicting the core component of the standard, around which all the others revolve. Namely, the four components needed for defining an EuGB as such⁵⁴ are: (i) the use of proceeds – aligned with the EU taxonomy –⁵⁵; (ii) the publication of a Green Bond Factsheet⁵⁶ (“GBF”); (iii) a mandatory reporting on the use of proceeds⁵⁷ and (iv) a mandatory verification of the GBF and the final allocation of proceeds carried out by an external reviewer⁵⁸.

Following the narrative deployed above in describing the ICMA GBPs, only the principles expressed under (i) and (ii) are relevant for this work⁵⁹: specifically, the core component (i) expresses the need that proceeds raised from the issuance of EuGBs shall be “*exclusively and fully*”⁶⁰ allocated for the finance or refinance of Green Projects – among which, as per the EU Taxonomy⁶¹, climate change

⁵⁰ European Commission (2021).

⁵¹ See Regulation (EU) 2020/852 (“EU Taxonomy Regulation”).

⁵² Under the EU Taxonomy Regulation, a project may be labelled as “green” if it: (i) contributes *substantially* to at least one of the six environmental objectives set out in Article 9 of the Regulation (these are (a) climate change mitigation; (b) climate change adaptation; (c) the sustainable use and protection of water; (d) the transition to a circular economy; (e) pollution prevention and control and (f) the protection and restoration of biodiversity and eco-systems); (ii) does not significantly harm any of these objectives, as per Article 17; (iii) complies with minimum safeguards set out in Article 18 and (iv) complies with Technical Screening Criteria established by the Commission.

⁵³ Indeed, according to the Commission, a standard for “high-quality green bonds” would (i) improve investors’ ability to identify such bonds; (ii) facilitate the issuance of these bonds by clarifying definitions of green economic activities (and reducing potential reputational risks for issuers in transitional sectors); and (iii) standardise the practice of external review and improve trust in external reviewers by introducing a voluntary registration and supervision regime. See European Commission (2021), p. 2.

⁵⁴ The same approach was taken by the TEG. See European Commission (2020), pp. 35 ff.

⁵⁵ European Commission (2021), Articles 3 and 6.

⁵⁶ European Commission (2021), Article 8 and Annex I (where the contents of the GBF are detailed).

⁵⁷ European Commission (2021), Articles 9 and 10.

⁵⁸ European Commission (2021), Article 9.

⁵⁹ Principle (iii) mandates the issuer to produce two different set of reporting: (a) an allocation report, which shall include breakdown of allocated bonds proceeds amounts to Green Projects and (b) an impact report, which shall cover, among others, a description of the Green Projects; the Environmental Objective(s) pursued and information – and where possible, metrics – about the Projects’ environmental impacts. Principle (iv) requires the issuer to appoint an External Verifier in charge of confirming the alignment of the issuer’s GBF with the EuGB as well as that the allocation of proceeds to Green Projects is in line with the Allocation Reporting.

⁶⁰ European Commission (2021), Article 4.

⁶¹ EU Taxonomy Regulation, Art. 9, paragraph (a) and (b).

mitigation and adaptation is considered an EU environmental objective. Similarly to what seen above with the ICMA FBPs, component (ii) strengthens component (i) by promoting transparency and clarity in the issuer's management of the proceeds. Indeed, EuGBs issuers are required to produce a GBF that (a) confirms the voluntary alignment of their green issuances with the EuGBs⁶² and (b) details key aspects of the proposed use-of-proceeds, such as the green strategy and the monitoring processes.

Though *prima facie* less direct and more nuanced in prescribing a sheer segregation of proceeds than the ICMA GBPs, it seems that also the EuGBs proposed by the Commission leans towards approaches – and legal structures – capable of implementing effective ring-fencing of proceeds. Somehow, this is implicitly reinforced by the requirement, placed upon the issuer, to produce a yearly allocation report “*until the full allocation of the proceeds of the European green bond concerned*”⁶³. Admittedly, as detailed above, it could not be otherwise: the promotion of an effective monitoring of intermediaries' ecological performance is best achieved via requiring the issuer to earmark proceeds for green projects. Yet, the European Commission takes an explicit stance on this issue, by making clear two points that are of absolute relevance for the possible issues raised by the election of Green Bonds within the relevant prudential capital layers: first, it notes how “*the use of the designation ‘European green bond’ is without prejudice to the requirements of*” the CRR as well as the BRRD, and secondly, it underlines how no provision in the proposed Regulation “*should be interpreted as restricting the issuer's ability to use the bonds to cover losses resulting from other activities, assets or parts of the entity. Neither should any provision in this Regulation be interpreted as restricting the power to write down or convert relevant capital instruments or liabilities of an institution pursuant to Directive 2014/59/EU, or upon the occurrence of a trigger event in accordance with Regulation (EU) No 575/2013*”⁶⁴.

In conclusion, proceeds *allocation, tracking, and segregation* in favor of, among others, climate change-related projects, are arrangements *supportive* of a transition towards a carbon-neutral economy, capable to alleviate those *externalities* that would stem from the financing of carbon-intensive projects. Put it differently, by encouraging the issuance of green bonds, governmental and non-governmental authorities would create the conditions for *aligning* private and social costs of pollution, by correcting the mis-pricing of financial risks.

In this respect, European capital markets have lately assisted to the issuance of *prima facie* green bonds within the Own Funds and Eligible Liabilities capital layers – which have been accordingly approved to count for regulatory purposes by the competent prudential authority. Still, as we found out in the previous Section, the Regulatory Capital and MREL/TLAC concepts are grounded on the paramount necessity to secure institutions a *truly loss-absorbing layer* (by ensuring proceeds permanence and

⁶² European Commission (2021), Annex I, Paragraph 2.

⁶³ European Commission (2021), Article 9.

⁶⁴ European Commission (2021), pp. 11-12.

fungibility in absorbing losses). Is this objective *compatible* with the *foundation stone* over which the notion and rationale of green bonds are built up – the *earmarking* of net proceeds for environmentally-related projects?

4. *Green bonds recognized as Own Funds and Eligible Liabilities instruments. When financial stability and environmental goals collide.*

As hinted in the closure of the last Section, European capital markets have been recently object of a *massive volume* of green bonds issuances⁶⁵. While in principle this is something worth supporting, representing a market-based solution to climate change and environmental risks, an even more recent market trend requires further scrutiny: the issuance of green bonds within the *prudentially relevant* capital layers detailed under Section 2 – what we could then rename as “*regulatory green bonds*”.

As we have seen, regulatory capital instruments are designed to function as *loss absorbing capital*, regardless of how the proceeds are used. They must meet the eligibility criteria set out in CRR in order to be counted as Tier 1 or Tier 2 capital, and they should not contain features that would *undermine* their *going/gone-concern loss absorbency*. A similar argument applies to TLAC/MREL Eligible Liabilities instruments as well; where consideration is on how the green bail-inable debt incorporating green features might jeopardize eligibility for *resolution purposes*, namely by raising NCWO concerns when the instrument is written down/converted.

More and more EU banks have started issuing green bonds within their (i) AT1 layer⁶⁶; (ii) Tier 2 layer⁶⁷ and (iii) MREL/TLAC layer – as Senior Non-Preferred Eligible Liabilities instruments⁶⁸ –, in order to meet their *mandatory* regulatory capital and bail-inable debt capacity requirements. Such green issuances have all received the necessary clearance for being elected in the relevant prudential tier by

⁶⁵ During the period 2013-2019, total net euro-denominated green bond issuances accounted for nearly half of global issuances, and the European green-bond market seems to be growing. For such observations, and for more data, see Schnabel (2019).

⁶⁶ On 7 July 2020, the Spanish lender BBVA issued € 1bn of green *hybrid* bond (“non-step-up Non-cumulative Contingent Convertible Perpetual Preferred Tier 1 Green Securities”), consequently elected in its AT1 layer. The prospectus can be found here: <https://shareholdersandinvestors.bbva.com/wp-content/uploads/2020/07/2020-07-15-BBVA-Folleto-AT1-VERSIÓN-FINAL.pdf> (hereinafter, the “BBVA Green AT1 Prospectus”).

⁶⁷ In this respect: (i) on 15 June 2020, de Volksbank N.V. issued € 500 million of *subordinated Tier 2 green* bonds. The Base Prospectus can be found here: <https://www.dev Volksbank.nl/assets/files/Investor-Relations/Debt-informatie/Unsecured-funding/Euro-MTN/Documentation/Base-Prospectus-17-October-2019.pdf> (hereinafter, the “De Volksbank Green Tier 2 Prospectus”), and it is accompanied by a Green Bond Framework (hereinafter, the “De Volksbank green bond framework”); and (ii) on 23 September 2020, Allied Irish Bank Group raised € 1bn through the issuance of a *subordinated green bond*, elected in its Tier 2 regulatory capital layer. The practices adopted by the firm for managing its green commitments are disclosed in the September 2020 “AIB green bond framework”, available on <https://aib.ie/content/dam/frontdoor/investorrelations/docs/debt-investors/green-bonds/aib-green-bond-framework.pdf>.

⁶⁸ On 13 April 2018, BNP Paribas issued € 500 million of green-*Senior Non preferred Notes*, as such admissible for counting for MREL/TLAC purposes. The final terms of the notes can be found here: https://invest.bnpparibas.com/sites/default/files/documents/bnpp_-_green_bond_april_2018_-_final_terms_fully_signed.pdf (“hereinafter, the “BNPP Green SNP Notes Final Terms”).

the respective National Competent Authority⁶⁹, so that we can assume that such debentures are perfectly compliant with the relevant CRR eligibility criteria. Do they still *maintain* and *safeguard* their green features, or in fact they had to *forgo* to such features once they have been deemed capable of *promoting financial stability*? Put it differently, it remains to be proved whether such issuances succeed in “killing two birds with one stone”, *i.e.*, achieving both *macro/micro prudential objectives and environmental targets* or in fact, the *link* between the bonds and the green assets – *essential* for pursuing environmental goals, as explained under Section 3 – has to be somehow sacrifice “in the name of the greater good financial stability”.

The following sub-Sections are organized as follows: each sub-Section will first delve, from a theoretical standpoint, into the *determinants* of the conflict between financial stability objectives (enshrined in the eligibility criteria for electing the instruments in the relevant prudential layer) and environmental goals (reflected in the “green bond” concept). Then, the analysis will move towards more *empirical and factual* topics, shedding lights on whether the various “regulatory green bonds” issued so far by EU institutions *effectively and truly* promote *environmental goals*. Each sub-Section will be focused on a particular capital layer.

4.1. *Non-feasibility of a green regulatory capital concept: green bonds as AT1 instruments.*

Regulatory capital instruments are designed to function as loss absorbing capital, CRR eligibility criteria are meant to provide for such loss absorbing function, and they remain *indifferent* on how the proceeds are used (*i.e.*, they mandate for a *full fungibility* of proceeds raised as per their exposure to losses). In fact, as alluded in the previous pages, green features, by *tying up* the use of the proceeds, may *impair* the functioning of regulatory capital. Let’s see how these constrains could arise with reference to AT1 eligibility requirements:

(a) *loss absorbency features*: AT1 instruments are intended to act as going-concern loss absorbing capital, by writing-down/converting to CET1 at the point that a bank’s CET1 ratio falls below the trigger level (under the CRR, such trigger shall at least be equal to 5.125%). Now, questions would arise over the *fungibility* of green and non-green AT1 notes’ proceeds incorporating *similar* loss-absorbing features (*i.e.*, the *same* trigger mechanism, thus subject to loss allocation on a *pari passu basis*, as per Commission Delegated Regulation 241/2014, Article 21(1)) in absorbing losses in a stress scenario, especially if: (i) the green investments are still *performing* and (ii) in line with the “green bond” notion,

⁶⁹ With regards to the Own Funds permission regime, and namely CET1 instruments, see CRR, Art. 26 (3). For AT1, Tier 2 and Eligible Liabilities instruments, the CRR does not mandate a *prior* approval by the Competent Authority, so that in these areas each Competent Authorities may decide to regulate the matter as they prefer (*i.e.*, via simple prior notification of the issuance; ex-post scrutiny or reliance on firms’ compliance with the applicable regulations).

the green proceeds have been legally *segregated* and *ring-fenced* from the *rest* of the assets. Indeed, if we accept what under (i) and (ii), this would imply that “green loss-absorbency” is meant (or could be *perceived*) to be *only* available for covering losses on green assets – in turn *undermining* the “overall” loss absorbency capacity of the issuer. And, while the EU Commission, as seen above, explicitly holds that its EuGB Proposal is not to be interpreted as “*restricting the issuer’s ability to use the bonds to cover losses resulting from other activities, assets or parts of the entity*”, one may wonder whether in fact an *effective* commitment to fully and exclusively use green proceeds for green-related projects *also implies* that green bonds should *not* be considered *fungible* with non-green bonds.

Effectively, while in a *going-concern* scenario ring-fencing is supportive of, and provides reliability over, the firm’s green commitment, in a *stress* scenario “*it would also weaken banks’ capital resilience because ring-fencing limits the ability of stronger parts of a banking group to support weaker parts*”⁷⁰.

(b) *permanence features*: AT1 instruments are meant to be *perpetual*, though they are permitted to include a *call option* exercisable at the sole discretion of the issuer after the fifth year since issuance). Besides, in order to ensure capital permanence to the greater extent possible, no step-ups or other incentives to redeem are permitted. Against this background, the *link* between the green assets and the green bonds may create some *market expectations* on (i) whether a possible *disqualification* of the assets as green assets, or the failure of the green project, should *impose* to the institution an obligation to *redeem* the instruments; and (ii) whether an incentive to redeem may be *integrated* by green assets maturing *without* the issuer finding suitable replacement.

As the reader may guess, the issues raised under points (a) and (b) above cast serious doubts on the *feasibility* and possibility to *factor* green elements into regulatory capital instruments and CRR eligibility criteria. The opposite holds true as well: given the current definition of “green bonds”, this seems *unsuitable* to accommodate *fully*, and without any frictions, loss absorbing and financial stability objectives.

Moving the analysis to the concrete features of the outstanding AT1 green securities, and in order to assess whether any of the above-raised issues is potentially emerging in the market too, we have found outstanding “green-regulatory issuances” to be *much more* “regulatory-like” than “green-like”. The contractual terms of such issuances indeed: (i) make clear that there is *no* legally binding commitment upon the issuer to “*apply the net proceeds of the Preferred Securities for any green projects*”⁷¹ and, accordingly, a failure to do so does not “*lead to an obligation of the Bank to redeem the Preferred Securities*”⁷² and, more importantly, it does not “*jeopardize the qualification of the Preferred Securities as Additional Tier 1 Capital of the Bank*”⁷³; (ii) do not include wordings implying that green capital

⁷⁰ Fitch (2020).

⁷¹ BBVA Green AT1 Prospectus, p. 41.

⁷² BBVA Green AT1 Prospectus, p. 41.

⁷³ BBVA Green AT1 Prospectus, p. 41.

transactions are directly exposed to losses or returns on green assets and (iii) make clear that the proceeds raised from the issuance of the bonds will be separately identified and applied in financing “*on a portfolio basis Green Projects*”⁷⁴.

4.2. *Non-feasibility of a green regulatory capital concept: green bonds as Tier 2 instruments.*

The majority of the observations made above could be *transposed* with regards to green Tier 2 instruments, as CRR eligibility criteria defining such asset class are primarily meant to provide for *loss absorbing functions*, and green features may *curb* such objectives.

(a) *loss absorbency features*: Tier 2 instruments are meant to act as *gone-concern loss absorbing capital*, by absorbing losses in a *liquidation scenario* with *priority to non-subordinated* creditors or, anyway, once the firm has been deemed failing or likely to fail – *i.e.*, a gone-concern or *quasi gone-concern* scenario. Thus, the very same *clashes* arising between AT1 loss absorbing features and green terms are bound to come up here as well. Namely, the (i) *subordination ranking* of Tier 2 notes, as well as (ii) the *fungibility* between green and non-green Tier 2 notes may be *questioned* by investors, especially if (i) the green investments are still *performing* (this is something that could very well happen also in an insolvency/resolution scenario) and (ii) in line with the green bond notion, the “green” proceeds have been legally *segregated* from the rest of the assets.

(b) *permanence features*: Unlike *perpetual* AT1 instruments, Tier 2 notes are meant to have an original maturity of at least five years, a requirement reflecting their nature of *pure plain-vanilla debentures*. Similar to AT1 notes, they may include a call option in favor of the issuer after the fifth year since the issuance. A prohibition of mechanisms giving rise to any incentive to redeem for the issuer is in place here as well. Still, despite some differences, the Tier 2 prudential framework will nonetheless pose the *same* issues underlined with reference to AT1 notes, mainly pertaining to market’s expectations about the existence upon the issuer of an *obligation* to redeem the notes.

So, unsurprisingly, the same conclusions we reached in the previous Sub-Section hold here as well: *factoring* green elements within the current prudential design of Tier 2 instruments seems *impossible* without creating conflicts with the *functioning* of this very design.

And the legal terms defining the current outstanding green Tier 2 notes do portray instruments that are in fact less environmentally than financial stability conducive, whereas they stress how: (i) “*the net proceeds from each issue of notes will be applied by the issuer for its general corporate purposes*”⁷⁵ and (ii) “*the issuer will strive to, and expects there to be sufficient eligible green loans available for,*

⁷⁴ BBVA Green AT1 Prospectus, p. 45.

⁷⁵ De Volksbank Green Tier 2 Prospectus, p. 77.

*the full allocation of the proceeds of the Green Bonds to an eligible Green Loan Portfolio*⁷⁶. Indeed, those very features required for having a *truly* green bond (above all, a legally binding green commitment) are here *rejected* – so that, conversely, the above mentioned issues are in fact not meant to arise.

4.3. *Non-feasibility of a green bail-inable capital layer: green bonds as TLAC/MREL Eligible liabilities instruments.*

The conceptual technique adopted by the CRR II for defining the MREL/TLAC relevant eligible liabilities/bail-inable debt category is *not different* from that employed by the Level 1 text for defining the Own Funds layers (see above, Section 2). Accordingly, we should expect to arise the *same clashes* between the green bond notion and the prudential eligibility requirements underlined above. And indeed, the *same issues* singled-out in Sub-Sections 4.1 and 4.2 are recognized by the European Banking Authority, in its “*monitoring of TLAC/MREL-eligible liabilities instruments of European Union Institutions*” report, as “*areas of attention*”⁷⁷ for the election of green bonds as MREL/TLAC Eligible Liabilities instruments. Thus, no further inspection is needed here.

Additionally, green bonds tailored to function as bail-inable debt may turn out to raise NCWO concerns: “*a possible perception by investors that green assets and green capital could be segregated from the rest of the assets and capital of the institution*” may result into “*possible challenges around the ‘no creditor worse off’ principle if the resolution authority decides to bail in the instrument while the green assets are still performing*”⁷⁸. As per other concerns raised in the previous Sub-Sections, such NCWO risks stem from the *expectations* hovering around the *ranking* of the green bonds in the *relevant insolvency waterfall*, and it could only be avoided whereby Resolution Authorities have been guaranteed that “*the issued capital is available to absorb losses incurred on not only green and social assets but all types of assets if needed*”⁷⁹. The violation of the NCWO safeguards may become a concrete *barrier to resolvability* of distressed banks and, in turn, activate Resolution Authority’s prerogatives to remove impediments to resolvability under BRRD, Art. 17.

The issues identified so far *always* originate from the green bond concept, *i.e.*, the *link* between the green assets and the notes and the *segregation* of the proceeds raised from the issuance.

⁷⁶ De Volksbank Green Tier 2 Prospectus, p. 77. Coherently, the De Volksbank green bond framework pinpoints how the implementation of the ICMA Green Bond Principles is made (p. 18) “*on a best effort basis*”.

A similar wording is adopted by the AIB green bond framework, whereby it is stressed how (p. 5) “*AIB, at its discretion but in accordance with the Green Bond Principles, will allocate an amount equal to the net proceeds of the Green Bonds to an eligible loan portfolio of new and existing green loans*”.

⁷⁷ European Banking Authority (2020), § 168.

⁷⁸ European Banking Authority (2020), § 167.

⁷⁹ European Banking Authority (2020), § 167.

Despite such *theoretical* obstacles, and *similarly* to the concrete Terms and Conditions of the *outstanding* green bonds elected as AT1 and Tier 2 instruments, *outstanding* green-bail-inable notes *do not* contain a green commitment that is “*legal and binding, and not allocating (sufficient) funding to green assets does not constitute an event of default*”⁸⁰. Put it differently, “*it seems that the proceeds of the issuance are not segregated*”⁸¹.

Once again, in the *balancing* between *environmental* and *financial stability objectives*, the scale is tipped in favor of the latter: those features that would contribute the most in pursuing green objectives are in fact *discarded* by the relevant notes’ Terms and Conditions.

5. *A pars construens: the (narrow) room for factoring green and climate-related commitments into regulatory capital and bail-inable debt and the case for (i) green coupons and (ii) green/climate-related loss absorption triggers*

The analyses undertaken in the previous pages offer a quite grim outcome: Own Funds as well as Eligible Liabilities instruments, in their *current definitions*, do not offer any room for factoring green commitments (*intended* as green proceeds’ *separation* from the rest of the other assets, due to the *link* between the green bonds and the green investments) *jointly with* financial stability – *i.e.*, loss absorbing – objectives. In the field of capital definition and eligibility, the issuer has to *choose* between promoting environmental *or* prudential goals, he “cannot have its cake and eat it too”.

In conclusion, it seems that if institutions are committed enough in *greening* their balance-sheet via the issuance of green bonds, they *shall not* rely on regulatory *subordinated* capital instruments for meeting such target: a *serious* green commitment may only be achieved by issuing *senior bonds*, a case in which segregation of proceeds could legitimately be pursued without incurring in any *prudential obstacle*. As we have tried to demonstrate, any environmental objective pursued in the form of *genuine* Own Funds or MREL/TLAC Eligible Liabilities instruments is at risk of being considered nothing more than a “green-washing” endeavor.

This is not to say that regulatory capital cannot be greened at all: a feasible way for greening the capital base, for instance, is offered by working on the capital ratio’s *denominator*, *i.e.*, on the concept of RWAs. Namely, by establishing and defining “*green risk-weights*”, capable of *reflecting* the macro-

⁸⁰ European Banking Authority (2020), § 163.

⁸¹ See European Banking Authority (2020), § 166. To be honest, the wording adopted by the BNPP Green SNP Notes Final Terms is quite nuance, *i.e.* not so clear-cut in denying legal *recognition* to the green commitment. Still, the issuer reserves himself some discretion over crucial choices linked to the green commitment, whereby (emphasis added) “*Pending the allocation or reallocation, as the case may be, of the net proceeds of the Notes to Eligible Green Assets, the Issuer will invest the balance of the net proceeds, at its own discretion, in cash and/or cash equivalent and/or other liquid marketable instruments. The Issuer will use its best efforts to substitute any redeemed loans, any other form of financing that is no longer financed or refinanced by the net proceeds, and/or any such loans or any other form of financing which cease to be Eligible Green Assets, as soon as practicable once an appropriate substitution option has been identified*”.

prudential benefits of financing sustainable investment projects, such as climate change-related projects. But were institutions really keen to factor green commitment into regulatory capital and bail-inable debt, there may exist ways for achieving this without putting in place, concurrently, any segregation of the green proceeds (as the current notion of “green bond” mandates). We will only mention two of these ways, cautioning the reader that far more thinking is needed on what follows:

(a) *Green coupons*: while payments on AT1 instruments need to be *fully discretionary*, Tier 2 debt and Eligible Liabilities instruments may incorporate an *obligation* upon the issuer to make regular interest-payments to the noteholders. In both cases, it seems compatible with the CRR requirements a *condition* in the instrument’s terms to subordinate such payments to the condition of green assets being performing. This would be a typical example of *project finance*, whereby claims incorporated into project-green bonds are “attached” and dependent on the cash flows of the financed green project itself. It goes without saying that while such transactions would be *legitimate*, they may nonetheless be *impracticable*, as green-debt holders would not only bear the risks of holding an inherently risky (Own Funds/bail-inable) instrument, but they would also see their remuneration conditioned to requirements *extra – i.e.*, the positive performance of green projects – than those that “ordinary” regulatory capital and MREL/TLAC instruments holders are subject to.

(b) *Green/climate-related conversion/writing-down triggers*: while AT1 instruments shall mandatorily contained a conversion/write-down trigger mechanism, Tier 2 notes and Eligible Liabilities instruments *may* incorporate such triggers.

In both cases, but especially for AT1 instruments, there seems to be theoretical room for introducing a trigger mechanism based on green/climate-related indicators and metrics. Here, the legal basis would be CRR, Art. 54 (1)(b), that enables firms to design AT1 instruments with *additional* and *alternative* triggers beside the minimum 5.125% CET1 ratio.

What remains to be seen though, is whether lawmakers and prudential regulators would in future decide to enable institutions to issue AT1 instruments *solely* anchored to green/climate-related triggers, as this would signal a *remarkable* shift towards green goals. This seems unlikely, as the main consequence stemming from “sole” green triggers would be the allocation of losses on green-AT1 holders *only* to the extent that losses do arise from green assets – and not from *all* the assets of the firms –, so that such resources would be *unavailable* in absorbing losses not stemming from non-green assets. Admittedly, this is not a welcoming outcome from a financial stability standpoint, especially on the verge of systemic stress, where such “cherry-picking” in distributing losses shall not be accepted.

Consequently, while a trigger mechanism based *solely* on green indicator(s) would most likely favor – and signal – the green commitment of the issuer, it is unlikely that regulators would permit firms to “compose” their, for instance, AT1 layers, *only* via issuances of such instruments – *i.e.*, a mandatory portion of the layer shall be composed of “traditional” AT1 notes.

Another issue raised by green/climate-related trigger pertains to the environmental indicators and metrics that could be *reliably* used for gauging firms' environmental performances. Ideally, such indicator should amount to a simple, "fast and frugal" figure, as it is today for the CET1 ratio. Things though appear to be more complicated. Indeed, the original debate around the optimal design of an AT1 mandatory trigger was basically centered on whether *forward-looking* or *back-ward looking* figures are preferable from a prudential perspective⁸²: the former, such as firms' market capitalization, while ideally capable to incorporate *future* financial information about the issuer, may be more prone to *manipulation* while the latter, such as book-figures, are by definition incapable to discount information not contained on historical data and time-series. Environmental metrics may pose the same *trade-off*, requiring regulators to strike a balance between the *meaningfulness*, *usefulness*, and *reliability* of different indicators.

⁸² See Avdjiev et al. (2013); Biljanovska (2016); Coffee Jr (2010) and Cahn and Kenadjian (2014).

BIBLIOGRAPHY

- Armour, J.; Awrey, D.; Davies, P.; Enriques, L.; Gordon, J.; Mayer, C.; Payne, J. (2016):** *Principles of Financial Regulation*, Oxford University Press, United Kingdom.
- Avdjiev, S.; Kartasheva, A.; Bogdanova, B. (2013):** CoCos: a primer, *BIS Quarterly review*.
- Baltali, C.; Tanega, J. (2011):** Basel III: Dehybridization of capital, *NYU Journal of Law & Business*.
- BCBS (2011):** *Basel III: A global regulatory framework for more resilient banks and banking systems*, available on www.bis.org.
- Biljanovska B. (2016):** Aligning market discipline and financial stability: a more gradual shift from contingent convertible capital to bail-in measures, *European Business Organization Law Review*.
- Binder, J. (2015):** *Resolution: Concepts, Requirements and Tools*, Bank Resolution: The European Regime, Oxford University Press, available on www.ssrn.com.
- Binder, J. (2019):** Resolution Regimes in the Financial Sector: In Need of Cross-Sectoral Regulation?, *European Banking Institute Working Paper Series 2019 – no. 33*, available on www.ssrn.com.
- Cahn, A.; Kenadjian, P. (2014):** Contingent convertible securities: from theory to CRD IV, *Institute for Law and Finance Working Paper Series No. 143*, available at <https://www.ilf-frankfurt.de>.
- Caldecott, B.; Tilbury, J.; Carey, C. (2014):** Stranded assets and scenario, Smith School of Enterprise and the Environment, *Discussion Paper*.
- Cannata, F.; Quagliariello M. (2009):** The role of Basel II in the subprime financial crisis: guilty or not guilty?, *Carefin Working Papers*.
- Cihak, M.; Nier, E. (2009):** The Need for Special Resolution Regimes for Financial Institutions—The Case of the European Union, *IMF Working Paper No. 09/200*.
- Coffee Jr, J. (2010):** Bail-ins versus bail-outs: using contingent capital to mitigate systemic risk, *Columbia Law & Economics Working Paper No. 380*.
- Drumond, I. (2009):** Bank capital requirements, business cycle fluctuations and the Basel accords: a synthesis, *Journal of Economic Surveys*.
- Ehlers, T.; Mojon, B.; Packer, F. (2020):** Green bonds and carbon emissions: exploring the case for a rating system at the firm level, *BIS Quarterly Review*.
- European Commission (2018a):** High-Level Expert Group on Sustainable Finance. Financing a Sustainable European Economy, available on www.ec.europa.eu.
- European Commission (2018b):** Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank, the European Economic and Social Committee and the Committee of the Regions. Action Plan: Financing Sustainable Growth, available on www.ec.europa.eu.
- European Commission (2019):** Technical Expert Group on Sustainable Finance. Report on EU Green Bond, available on www.ec.europa.eu.

European Commission (2020): Technical Expert Group on Sustainable Finance. Report on EU Green Bond – Usability Guide, available on www.ec.europa.eu.

European Commission (2021): Proposal for a Regulation of the European Parliament and of the Council on European green bonds.

European Banking Authority (2020): Report on the monitoring of TLAC/MREL-eligible liabilities instruments of European Union Institutions, available on www.eba.europa.eu.

Financial Stability Board (2009): *Report of the Financial Stability Forum on addressing procyclicality in the financial system*, available on www.fsb.org.

Financial Stability Board (2014): *Key attributes of effective resolution regimes for financial institutions*, available on www.fsb.org.

Financial Stability Board (2015): Principles on Loss-absorbing and Recapitalisation Capacity of G-SIBs in Resolution, available on www.ssrn.com.

Fitch (2020): Sustainable Bank Sub-debt May Not Stay Green During Crises, available on <https://www.fitchratings.com/research/banks/sustainable-bank-sub-debt-may-not-stay-green-during-crises-22-07-2020>.

Giuzio, M.; Krusec, D.; Levels, A.; Melo, A.; Mikkonen, K.; Radulova, P. (2019): Climate change and financial stability, *ECB Financial Stability Review*, available on www.ecb.europa.eu.

Gleeson, L. (2012): Legal aspects of bank bail-ins, available on www.lse.ac.uk.

Iannotta, G. (2006): Testing for opaqueness in the European banking industry: evidence from bond credit ratings, *Journal of Financial Services Research*.

Intergovernmental Panel on Climate Change (2014): *Climate change 2014: synthesis report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Geneva.

International Capital Market Association (2018): *Green Bond Principles. Voluntary Process Guidelines for Issuing Green Bonds*, available on <https://www.icmagroup.org>.

Joosen, B. (2015): Regulatory capital requirements and bail in mechanisms, available on www.ssrn.com.

Joosen, B. (2014): Bail-in mechanisms in the bank recovery and resolution directive, available on www.ssrn.com.

Lamandini, M.; Munoz, M. (2016): Minimum requirement for own capital and eligible liabilities (MREL), available on www.lamandini.org.

Morgan, D. (2002): Rating Banks: Risk and Uncertainty in an Opaque Industry, *The American Economic Review*.

Nordhaus; W. (2014): *The Climate Casino: Risk, Uncertainty, and Economics for a Warming World*, Yale University Press.

- Pinker, S. (2018):** *Enlightenment Now: The Case for Reason, Science, Humanism, and Progress*, Viking Pr.
- Repullo, R.; Suarez J. (2013):** The procyclical effects of bank capital regulation, available on www.cemfi.es.
- Richardson, J.; Stephenson, M. (2000):** Some aspects of regulatory capital, *FSA Occasional Paper Series*, 2000.
- Schnabel, I. (2020):** *When markets fail – the need for collective action in tackling climate change*, speech at the European Sustainable Finance Summit, Frankfurt, available on www.ecb.europa.eu.
- Short, B. (1978),** Capital requirements for commercial banks: a survey of the issues, *Staff paper – International Monetary Fund*.
- Thole, C. (2014):** Bank crisis management and resolution, available on www.ssrn.com.
- United Nations (2015):** Paris Agreement, available on <https://unfccc.int>.
- World Bank (2012):** *Turn down the heat: Why a 4°C warmer world must be avoided*. Washington.
- Zhou; J.; Rutledge; V.; Bossu; W.; Dobler, M.; Jassaud; N.; Moore; M. (2014):** From Bail-out to Bail-in: Mandatory Debt Restructuring of Systemic Financial Institutions, *IMF Staff Discussion Note*.

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