Green Bonds for Natural Capital – some issues

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1. Green bonds have been proposed as a way to increase funding for improvements in the natural environment in general, and in natural capital in particular. This note identifies some of the core issues in thinking through how they would work in practice.
2. Green bonds raise two separate questions: what is the role of debt (as opposed to equity) finance in relation to natural capital investments? and what is special about "green" bonds as opposed to other debt? These are typically conflated together, but they are distinct and separate questions.

The role of debt and equity

3. There are three forms of finance for investments: debt; equity and current revenues from retained earning (i.e. shareholders' funds); and revenues from current customers and taxpayer receipts. Green bonds are a form of debt finance, alongside Treasury and corporate bonds.
4. In every investment there is always *equity* risk, and it is the efficient and clear allocation of equity risk, which defines the role and context of debt.
5. Equity risk never goes away. In the context of a green investment, equity risk relates to the various ways in which projects can go wrong - through the development itself, through changes in the rules, regulation and the commitment for payments. It can be poor management and cost overruns, change in government and regulatory behaviour, and price and contract risk.
6. Equity risk should be allocated to those best able to manage it. It should not be assigned to debt holders. Broadly, in the case of project development, it should be assigned to the management; in the case of

regulatory risk, to the government; and in the case of price and contract risk, between the customers and the developer.

7. Since a general objective of government is to shift equity risk to the private sector, the regulatory risk is frequently misallocated, in turn adversely impacting on the role and risk associated with green bonds. Only for those aspects of the project that are within the control of management should the equity risk be transferred. The very high costs of capital arising in some PFI and PPP projects are a reflection in part of this inefficient risk allocation.
8. The fact that the government can borrow at a lower cost than companies does not change the cost of equity – but it does change the cost of debt. Many NGOs and other argue that the government should borrow to finance projects, without explaining where the equity risk goes. The result is that taxpayers bear these equity risks, and hence the implied risk premium.

Risk allocation

9. Applying the sources of finance to green businesses, there are various areas of activities: creating new assets; capital maintenance for existing assets; and current expenditure in running the businesses. For new asset creation, a mix of equity and debt finance. The equity owners bear the risks; the debt holders provide the short-term money whilst the project is undertaken. When it is completed, the construction risk goes away, and hence a different debt/equity mix may be appropriate in refinancing the business. Completed assets need to be maintained, and here the current revenues are appropriate, and shareholder funds are net of this capital maintenance. This is in effect current income (customer income and government cash) to pay for the use and damage to the asset.
10. This introduces an important distinction. Asset creation should be "pay-when-delivered" whilst asset maintenance should be "pay-as-you-go". Put simply in a couple of examples, new equity and borrowing should be used for new flood defence assets and new roads; whilst current revenues

should pay for maintaining the existing flood assets and for mending the potholes in existing roads. Some of the equity can be paid out at refinancing when the project is completed, leaving a higher level of gearing.

Environmental and private benefits

11. Across the natural environment, there are host of projects that are likely to have positive net public benefits. Some will also have net private benefits. The market can do the latter: there is no need for intervention, and no need for specific "green" bonds.
12. The focus is therefore on projects where the public benefits tip the project toward a positive net present value. These include a host of new assets relevant to the 25-year natural capital plan. Some examples are: new woods and forests; new parks and investments in the Green Belt; urban green spaces; restoration projects; coastal wetland creation and so on.
13. In all these cases, the inescapable fact is that the public environmental benefits are not captured in existing revenues. So any investor in equity or debt is going to want an answer to the question: where is the money coming from to make the public environmental dimension into a defined revenue stream and hence make the project privately investable?
14. There are many answers to this question available. First, there are existing budgets being spent inefficiently that could be channelled into this new asset creation. For example, aspects of health budgets would probably be better spent on green solutions to stress, obesity and air quality health mitigation. Education in the outdoors is valuable, as the considerable demand to Duke of Edinburgh Awards Scheme and other training and leadership skills programmes and courses. Some of the education budget might be better spent in these ways.
15. The most relevant reallocation of existing revenues is probably in respect of the environmental components of the CAP subsidies. In the case of catchment assets, the subsidies could be auctioned to provide the greatest asset creation benefits.

Compensating and compensation funds

16. A further source of revenues to close the gap between public and private benefits is through compensation or offsetting for damages caused elsewhere. The argument is that where developers damage natural assets, they should compensate. The compensation monies should then go into a natural capital fund, which can then be invested in the creation of new offsetting assets elsewhere. A proposal for such a fund is set out in my book, *Natural Capital.*
17. This compensation principle is a core part of the natural capital approach. It requires very careful definition and the creation of a credible institutional framework. Otherwise it can easily be described as a "licence to trash". A crucial point here is that natural capital comes in systems and not individual assets or species. Simplistic application of planning regulations to single species, like newts, is an obvious example of how such crude single-species approaches fail to take account of ecosystems and hence are not credible.
18. Revenues from this sort of fund can be assigned to enhance the returns for specific natural capital investments, which can be financed through the raising of debt and equity. Note however that the green bond is not lending from the fund itself, but rather a leveraging of the revenues that the fund can provide.

Optimal debt and equity mix for green projects and refinancing

19. Once there is a revenue flow in place, the next question is the optimal mix of debt and equity. In the usual example that the green bonds advocates cite – current renewables in energy – the answer is typically a lot of equity to build the wind farm or solar installation, and then once completed, lots of debt. The reason is very simple: once completed the equity construction risk largely disappears, and the price/contract risk passes to the customers through the compulsory requirement to pay for

the Feed in Tariffs. The result is that there is little equity risk left with the companies, and hence these projects are typically refinanced by infrastructure and pension funds as debt vehicles.

20. The interventions to support renewables follow this pattern. Until recently there have been lots of equity-based tax incentives, which draw in investors. Then the projects are typically sold on to infrastructure and related funds (or proxies for them), thereby realising the value of the equity investments.
21. Some new natural capital assets are amenable to this sort of financial approach. Flood defence assets, and waste handling are examples.

Assets-in-perpetuity and Trusts

22. It is far from clear however what the role of green bonds might be in relation to say a new park. These differ from the wind, solar and waste assets in that they are typically *assets-in-perpetuity*, and indeed much of the core natural capital is of this form. We want renewable natural capital to go on renewing itself in perpetuity.
23. A new asset, like a park or a woodland, would have some marketable outputs and hence revenues. Timber might be sold, amenities might be rented out, and new businesses using the asset for the sale of courses, experience holidays, angling and so on might be charged a fee. Anglers for example pay a fee to the Environment Agency for their licence, and often for river and lake access too.
24. It is however not surprising that many of these sorts of assets are managed by Trusts and other not-for-profit organisations. The reason is that they have public obligations, which go beyond private profit maximisation. Canals, the National Trust, the Wildlife Trusts, are some examples.
25. Where assets are in perpetuity it makes sense to run them on the basis of pay-as-you-go, out of current revenues from members, local and national government and charitable organisations. The key feature is that their members bear the equity risk, and their liability is limited to the current

financial assets, which tend to be small relative to their budgets, since their objectives in effect require them to deploy the income to the public purpose they have.

26. When one of these sorts of Trusts wants to acquire or create new assets, they typically appeal for donations. They rarely borrow.
27. The case for doing more borrowing relies on the assumption that the debt can be repaid at some future date, or at least serviced. Thus, a University might borrow to build new student accommodation, or even a new campus. But it does this knowing that the additional assets will generate a revenue stream from future students and government, which exceeds the expected interest costs and depreciation. The Trusts referred to above do not have depreciation (they have capital maintenance for assets-in-perpetuity) and they may not have additional revenues, unless they can attract new members and users, and raise membership fees.

A natural capital balance sheet

28. Governments have typically played the role of using current pay-as-you-go taxpayers' funds to invest in the natural environment alongside the Trusts, taking up the further gap between the social benefits and the private benefits (including the membership fees). In many cases, the argument for green bonds comes down to a form of off-balance sheet finance, so as to invest in new assets but keep them off the government's current accounts.
29. This has two separate rationales. The first is that the creation of a new asset is for the benefit of future generations, and borrowing is a way of making them – rather than the current generation – pay. The second is that the government lacks a proper balance sheet to set the new asset against the debt liability.
30. The optimal solution to this problem is to create a natural capital balance sheet, and then for investments to be made and liabilities (green bonds and equity) to be set against these. Whether it is then better to have government equity (public ownership) or private equity is a matter of

risk assignment. The role of debt then comes in respect of the completed assets.

The RAB-based utility model

31. This approach has worked in the case of privatised utilities, and notably water. The staring point is the risk allocation. Independent regulators guarantee that the utilities can finance their functions, and hence that customers will pay. The equity risk is thereby largely transferred to customers. The risk that governments might renege on this contract is further reduced by the role of the regulator. The utilities then distinguish out operating costs (payed by current customers), capital expenditures (financed through a mix of retained earnings, equity and debt). Crucially the assets then go into a Regulated Asset Base, which is protected by the regulator, and has no (or virtually no) equity risk. This is financed by debt, and at rates of interest very close to those of the government.
32. A key lesson from this utility example is that the model can be carried over to a host of natural capital assets. It can be applied to flood defence, to national and other parks, to catchment assets and to urban assets. The financial efficiency and the costs depend on the clarity with which the risks and the revenues are assigned.

Special "green" aspect of debt and equity

33. All of the above is about equity and debt in the general sense. Some argue that there is something special about the label "green" applied to bonds. It is argued that some investors have motives other than pure private profit: they want their savings to go into things they value and have some "ethical" value. There are obviously such investors, and the development of green financial products reflects this. The impact is to deliver a lower cost of debt. The private financial markets have been quite good at developing these products and there is now a long history. The challenge is the application of appropriate criteria to asset selection by these funds

and financial institutions. A number of private and public bodies offer accreditation services.

Taking the idea forward

34. In taking the green bond ideas forward, the following steps are recommended:

(i) identify which investments are enhancements – adding new assets – and which are capital maintenance
(ii) distinguish between pay-when-delivered for new assets, and pay-as-you-go for existing assets
(iii) debt and equity finance is appropriate for the former, and current revenues are appropriate for the latter
(iv) assign the equity risk to those best able to manage it – to the developer of the project for the project management and delivery risk; and to government for the regulatory risk
(v) internalise the social and environmental benefits above and beyond the private benefits and provide a revenue stream to compensate
(vi) apply compensation principles provides a stream of revenue to address some of the shortfalls where social and environmental benefits are not fully internalised
(vii) use a mix of equity and debt for the project development and delivery, and refinance with debt when completed
(viii) use the RAB-based utility model as a template
(ix) encourage the development of accreditation to adjudicate on the "green" dimensions of specialist investment vehicles for environmentally altruistic investors
(x) limit charities and Trusts ability to borrow only to the creation of new assets where the future revenue streams can clearly justify the servicing and repayment of debt.