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Responding to Climate Change Through Proactive Prudential Supervision

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ABSTRACT

Climate policy faces the challenge of dealing with pervasive and massive externalities compounded by crucial market failures. The price system, left to its own devices, is incapable of adequately dealing with this challenge. It requires the support of appropriately crafted policy. However, this policy needs to be as pervasive as the climate challenge itself. Only one policy so qualifies: finance policy. For finance is everywhere.

Financial regulation is a suitable fulcrum for climate policy because it is: *efficient, effective, pertinent, appropriate, and right.* Moreover, it is administered by trusted institutions.

Some financial policy interventions *provide* finance directly, others *promote* such provision, yet others *protect* from risk, and yet others *prevent* risk. *Proactive prudential regulations (PPRs)* fall mostly into the latter three categories, since they have a targeted objective, and are designed to elicit behavior in the private sector.

Examples of *PPRs* with large scale impact can be drawn from mortgage finance, vehicle finance and agricultural finance, information infrastructure and ESG. Natural disasters represent a special case because of the compressed nature of the destruction of physical assets. *PPRs* in this case need to include pre-positioned emergency responses and pre-positioned recovery policies.

In conclusion, financial regulations are particularly suited to dealing with climate externalities because both are pervasive and have other similar characteristics. Numerous existing regulations can be made pertinent to this objective. Moreover, they lie within the administrative discretion of the financial authorities and could thus be quickly implemented.

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The Challenge Facing Climate Policy: Pervasive and Massive Externalities Compounded by Crucial Market Failures

Free markets, in which individuals endowed with private property interact based on their own interests, have been found to be extremely efficient at economizing on the number of institutional rules required, while having been effective at producing a very substantial increase in the economic wellbeing of humanity.

However, markets do have their limitations, and these come paradigmatically to the fore as we confront the challenge of climate change: almost every single identified market failure is present in one way or another now that climate change has become really important. It is worth stopping for a moment to review the problem this constitutes.

The beauty of "the" price system is that it allocates resources well, both in the present and to the future. But if the price system has important failures, the resulting allocation can be quite wrong. Moreover, since the price system is interdependent (general equilibrium), a few strong market failures can throw the whole allocation system off.

Here are some of the challenges climate change confronts the conventional market general equilibrium with:

- Production externalities are writ large, because climate affects almost everything we do, hence all production processes.
- But consumption externalities certainly play a role: imitative consumption behavior has been furthered by the communication revolution. What used to be "keeping up with the Jones" is now no longer local, but international.
- Depressed (sub-optimal) savings rates result.
- This, in turn, aggravates an existing human tendency to take far too short a view of things. Over-discounting the future results; under-saving for old age is one of the consequences.[2]
- On climate change, the implication is to do too little.
- Innovations and inventions are, almost by definition, impossible to know before they occur. So how could they be priced in correctly? Yet they are a crucial part of adjustment to climate change.
- Human responses to required adjustment are not always forthcoming nor occur with the correct speed. That occurs both in the private sector and the public sector.
- In the private sector, individuals often operate by rules of thumb and therefore maintain sub-optimal behaviors for significant periods of time. In turn, firms are composed of individuals, and thus also do not modify their response to prices in the manner in which conventional microeconomics might suggest.[3]
- In the public sector, modifications of rules and regulations are subject to political procedures and often to the building of consensus. As a consequence, such changes occur slowly. Many rules and regulations are therefore outdated: they respond to what has been, rather than to what will be. As a result, they cause further imperfections in the market signals.

2 Frisch, Ragnar, "Dynamic Utility," Econometrica, Vol. 32, No. 3 (Jul., 1964), pp. 418-424

3 Leibenstein, Harvey, Beyond Economic Man, Harvard University Press, 1976

It follows that economic policy needs to come to the rescue of a market that is now burdened with more than it can cope with. But such economic policy needs to have a characteristic of pervasiveness similar to that of the climate challenge itself. Only one so qualifies: finance policy. For finance is everywhere! Therefore, it falls to finance policy to take up the gauntlet.

Finance policy consists largely of *financial* regulation. Here is why financial regulation turns out to be a suitable fulcrum for climate policy:

- *it is efficient* - it reaches everywhere (even into the most informal parts of the economy);
- *it is effective* - it motivates behavior;
- *it is pertinent* - diffuse motivation is ideal for coping with diffuse externalities;
- *it is appropriate* - diffuse motivation is ideal for coping with the desirability for varied innovation,
- *it is right* - doing well while doing right combines the profit motive with morality (as represented by law abiding behavior).

Last, but certainly not least, is the nature and qualifications of the financial regulatory authorities. They are competent, highly regarded, especially by the business sector. Therefore, their intervention is viewed as legitimate, and they are usually incorruptible. If one is looking for a trustee of the public good, one can find no better.

A Typology of Regulatory Interventions

Policy actions can be of different kinds and do not necessarily fall into neat categories. Moreover, some of them are more suitable to be adapted to coping with climate related challenges than others. The following provides a useful typology:

- *Provide,* in which the authorities mandate the provision of finance. Examples are credit quotas, compulsory insurance, and finance provided by specialized state owned lenders. If effective, the advantages are a greater immediacy of implementation, an easier access to the designated target population and easier monitoring of compliance and implementation. The disadvantages are the need for repeated changes as conditions in the economy change, progressive denaturalization of the objectives of the measures as users learn to game them, possible deliberate misclassification of beneficiaries by the implementing agencies, difficulty in detecting fraud in qualifying for the benefits, and possibly graft in administration.
- *Promote*, in which the authorities create a framework which provides incentives for the private sector to provide financial services on a preferential basis. Examples are differential capital requirements and provisioning rules; flexibilization of collateral requirements; and simplification of KyC rules ("proportionality"). The advantages include greater reliance on the market mechanism, less need to anticipate what the economy will require, more scope for broad support of innovation. The disadvantages are a slower adoption, possible undesirable and unanticipated side effects, possible misapplication and misuse of the rules, and scope for regulatory arbitrage.
- *Protect,* in which the authorities create mechanisms for risk reduction or loss compensation which will be triggered under pre specified circumstances. These may involve public funds or private funds, insurance and reinsurance, or exceptional access to funds normally reserved for other purposes. The advantages are that when a protected event occurs, there is no need for

improvisation, the compensatory action is pre-identified, and, therefore, the damage is less and recovery is accordingly more rapid. The main disadvantage is there may be some increase in risk taking as a result of the socialization of losses.

- *Prevent,* in which authorities require the financial system to implement a voluntary or obligatory Environmental and Social Risk Management System (ESRM) such as the Equator Principals. The advantage is an extensive internalization of the externalities involved in environmental and social policy; "doing well while doing good" gets a major boost; compliance with existing environmental and social regulations is enhanced; risks are reduced. The disadvantage is an increase in operating costs of financial institutions and in operating companies. However, these costs are presumed to be more than offset by risk reduction.

Proactive prudential regulations (PPRs) fall mostly into the latter three categories, since what characterizes such interventions are two elements: (a) they have a targeted objective, and, (b) they are designed to elicit behavior in the private sector.

Examples of Potential Proactive Prudential Regulations (*PPR*s) and Their Effects

- Mortgages: constitute a major part of bank portfolios, and finance the bulk of home and commercial construction. Prudential regulation requires provisioning such loans.

  Details of climate related issues such as insulation of walls and roofs, double or triple glazing of windows, strong anchoring of roofs (against storms), inclusion of thresholds (against flooding), inclusion of solar panels for hot water or electricity, all depend on construction codes which are often local.

  Consider, now, a *proactive prudential regulation* to the effect that climate friendly construction will henceforth have one half or less of the required provisioning of conventional construction, whereas the latter´s provisioning requirement is raised. Banks and other financiers will find lending for climate friendly construction significantly more attractive, while jurisdictions controlling the construction codes will find it attractive to modify the codes in order to make mortgages in their jurisdictions less costly. The net result will be a speedy adaptation of construction to the new climatic requirements.

  Loans for retrofitting could also qualify for the lower provisioning requirement. Moreover, if, in addition, the new provisioning regulation applies to mortgages on properties that are suitably retrofitted, the impact would be even greater.

- Vehicle finance: a significant part of private can ownership is financed; an even larger fraction of the commercial vehicle fleet is purchased on credit. Again, existing prudential regulations require provisioning such loans.

  Consider, now, a *proactive prudential regulation* that differentiates the required provision in accordance with the fuel used to power the vehicle. Highest for gasoline and diesel, medium for natural gas, and lowest for electric vehicles[4]. Consider, in addition, a low provisioning requirement for conversion loans to the use of natural gas.[5] Consider also, finally, a low pro-

4 A more sophisticated version would tie fuel or power efficiency directly to the provisioning, but such a version might run into implementation difficulties.

5 The technology for converting gasoline engines of automobiles to dual use (natural gas and gasoline) is well known and inexpensive. Retail costs run below $1000 per vehicle and take a few hours to complete. Conversions from diesel are more expensive (up to $3000 per vehicle) and more time consuming. Conversion of heavier equipment is also available.

visioning for loans to expand the network of service stations capable of providing recharging facilities for natural gas and electric vehicles.

The effect on the structure of fuel use in the vehicular fleet would no doubt quickly reflect the change in financial incentives. Of particular importance would be the incentive to retrofit the engines of passenger cars (private as well as cabs) to dual use: such change can occur rapidly *and on the existing fleet*. No junking of cars needed and, therefore, no loss or write down of asset values. Indeed, where natural gas is less expensive than gasoline, the conversion costs will more than pay for themselves in fairly short order.

- Irrigation Agriculture: financing agriculture is always a challenge. It is surprising, therefore, that there may be a connection between such finance and global warming. However, growing rice in traditional paddies that are flooded is a major producer of methane, (CH_4)[6], a powerful greenhouse gas. But rice can also be grown under dripper irrigation, thus avoiding the production of methane. Obviously, the installation of drippers would need to be financed.

  Now, consider a *proactive prudential regulation* that establishes a low provisioning requirement for dripper irrigation applied to rice fields. The externality resulting from the lower greenhouse emissions would more than justify the low provision. Naturally, normal prudential loan approval requirements would still need to apply. However, the announcement effect as well as the incentive involved in the provisioning requirement would most likely move lenders, borrowers and technology providers to more vigorously pursue this opportunity.

- Information bases: credit registries, property registries, crop yield registries and meteorological data registries are all inputs needed for effective and efficient financial markets to function. Indeed, they can be thought of as part of the *social overhead capital* required to underpin the markets.

  Consider a *proactive prudential regulation* designed to set up an effective credit registry, or to ensure the existence of a reliable property registry, or to adequately record meteorology data such as winds, sunlight, or cloud cover. Such a regulation would enable credit to be provided with lower risk, insurance to be written on more reliable actuarial data, and hence, at a lower price, etc.

  One might question how the Financial Regulator could affect the creation or improvement of such data bases. However, Regulators have routinely been involved in creating credit registries, thus the precedent exists. If there is an incentive, such as lower provisioning or the authorization of insurance provided data are available, private or public bodies will find it attractive to gather the relevant data.

  Reliable information has a pervasive and positive influence on economic activity and its provision is therefore of justified concern for financial regulators.

- ESG (Environmental, Social, Governance) Regulations.

  Extended Due Diligence, of the kind practiced in application of the Equator Principles has proven to be highly effective at internalizing a variety of socio-environmental concerns in bank operations. Accordingly, countries are gradually moving to making such practices com-

6 Bowen Zhang et al, "Methane emissions from global rice fields: Magnitude, spatiotemporal patterns, and environmental controls," https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1002/2016GB005381

Yu Jiang et al, "Acclimation of methane emissions from rice paddy fields to straw addition," *Science Advances* 16 Jan 2019: Vol. 5, no. 1,

pulsory[7]. The resulting greater ex-ante awareness of socio-environmental risk, including for instance carbon footprints, and the resultant greater application of early palliatives and of grievance procedures has proven to more than pay for itself.

The Special Case of Natural Disasters[8]

A particular characteristic of natural disasters is the concentrated destruction of physical assets in a very short period of time. This contrasts with the destruction of physical assets slowly and gradually as part of long term climate change.

Abrupt physical destruction of assets produces an immediate requirement for physical shelter and for undestroyed sources of food. However, it is common for the physical destruction to have affected productive assets and, therefore, employment and income opportunities, and, of course, the tax base.

In turn, the financial system is impacted by destruction of collateral and of ability to pay, by an increase in defaults, by required insurance payouts and by a change in the fiscal balance towards deficit**.**

A well-designed set of *proactive prudential regulation* oriented towards climate change can also be made to serve when a climate disaster strikes. However, it is desirable to have two types of additional regulations in place for this contingency: (a) pre-positioned emergency response and, (b) pre-positioned recovery policy. Both can be thought of as constituting *Disaster Continuity Planning.*

a. *Pre-positioned emergency response*

   Such policies need to be in place *before* the disaster occurs, for in the middle of an emergency there is no time for fine crafting.

   i. Access to emergency cash

      This may range for substitutes for locally inoperative ATMs, such as cash made available in pharmacies or supermarkets through expansion of digital wallets.

   ii. Access to *own* funds on an emergency basis

      Here the issue is suspending waiting requirements, such as for withdrawal of term deposits, or access to a fraction of retirement funds (with or without later repayment).

   iii. Automatic advances against transfer payments from the government, be they conditional transfer payments, old age pensions or disability benefits.

   iv. Immediate partial insurance payouts, say 20-25% of the benefit, with final adjustment at a later date.

   v. Lending programs to individuals and MSMEs

      Emergency loans under preferential conditions against the pledge of any available assets.

7 Peru has been the pioneer. Cf. Schydlowsky, D.M. & Robert C.Thompson, "Reducing the Risk of Social Conflict", Americas Quarterly, spring 2014. Paraguay and Nepal are other cases in point. Honduras is currently considering compulsory regulations. The number of voluntary agreements is much larger, Cf. Frisari, GianLeo et al, "Climate Risk and Financial Systems of Latin America: Regulatory, Supervisory and Industry Practices in the Region and Beyond," Technical Note No Idb-Tn-01823, December 2019

8 For a fuller discussion, Cf. Schydlowsky, D.M., "Prudential Regulations For Greening The Financial System: Coping With Climate Disasters", Presented to CEMLA Conference, December 2019

vi. Credit line for local government

"First Response" will fall on local government. And local persons can provide much of the labor needed. However, funding will be needed. The regular budget will not be able to provide such.

b. *(b) Pre-positioned Recovery Policy*

Once a climate disaster has occurred, its effects evidently need to be remedied; that is the role of *recovery policies*. To the extent they are pre-positioned, they will be more easily and quickly implemented, and most likely, also better designed and more effective.

i. Recovery lending

As part of a package of recovery policies, such lending should have some special characteristics. These may require specific authorizing regulations:

- Terms: based on the cash flow profile of the underlying project and/or the expected recovery by the debtor of employment.
- Flexible servicing dates: especially where rural and agricultural credit is involved.
- Interest rates: ensure that the underlying project can indeed bear them. Incorporate the positive externality of everyone rebuilding at the same time.
- Built in maturity extensions: to reflect uncertainty of recovery speed, pre-establish extension terms and costs to be activated at the borrower´s option.

ii. Roll-over of emergency loans:

Once the immediate emergency is over, whatever emergency loans were extended need to be rolled over into more permanent instruments. The aforelisted considerations will be relevant here as well.

iii. Recovery Credit-Worthiness

Will be different from conventional credit worthiness, because of the special circumstances surrounding climate disasters. Could consider: (a) past history of income generation, (b) human capital, (c) reconstruction context foreseen for the affected area.

iv. Collection of Data for Future Insurance

Collection of relevant statistics usable for actuarial calculations in the future need to be part and parcel of the recovery policies, for there will be a next time.

v. Availability of Sub-regional and Municipal Finance

Reconstruction and recovery will clearly require action at the municipal level. Pre-agreed upon financing mechanisms and limits will be needed.

As can be seen, *Disaster Continuity Planning* is a matter of some complexity. It should surprise no one, therefore, that it would require a number of *Proactive prudential regulations (PPRs)* for implementation.

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Conclusion

- Financial Regs are particularly suited to dealing with climate externalities because both are pervasive and have other similar characteristics.
- There are numerous existing regulations that could be used to further the purposes of climate policy; indeed they fall into quite broad categories of options.
- These regulations lie within the administrative discretion of the regulators and thus require no external approval, e.g. parliament. Moreover, because of the standing of the Regulators, they are likely to be broadly accepted by the body politic.
- In addition, because they lie within the Regulator´s discretion, they can be applied with all deliberate speed, allowing a move forward with climate related policies, and respecting only the economy´s and society´s capacity to assimilate rapid change.