Climate Finance, Carbon pricing and linkage of mitigation efforts in a fragmented world

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Comparison and Linkage of Mitigation Efforts in a New Paris Regime

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Back to the basics

- **Lemma 1:** Put a **price** on carbon to internalize its **social cost and equalize marginal abatement costs** across countries and sectors
- **Lemma 2:** This will **trigger investments** in low carbon projects
- **without distortions** in **international industrial competition**
- **Candidate systems: carbon tax / cap and trade … and hybrids + transfers as a lubricant (ODA or generous caps)**

Wisdom or… 'tabulae rasae' utopia?

The reasons of the « fragmentation » of climate action

This 'mental map'

- reconciles environmentalist political will, national sovereignty and economic rationality

But

- confronts the heterogeneities of the real world: incomes, consumption and industrial structures, general equilibrium effects, local externalities, other markets structures (real estate, labor etc …)

- hits existing capital stock and hurts vested interests

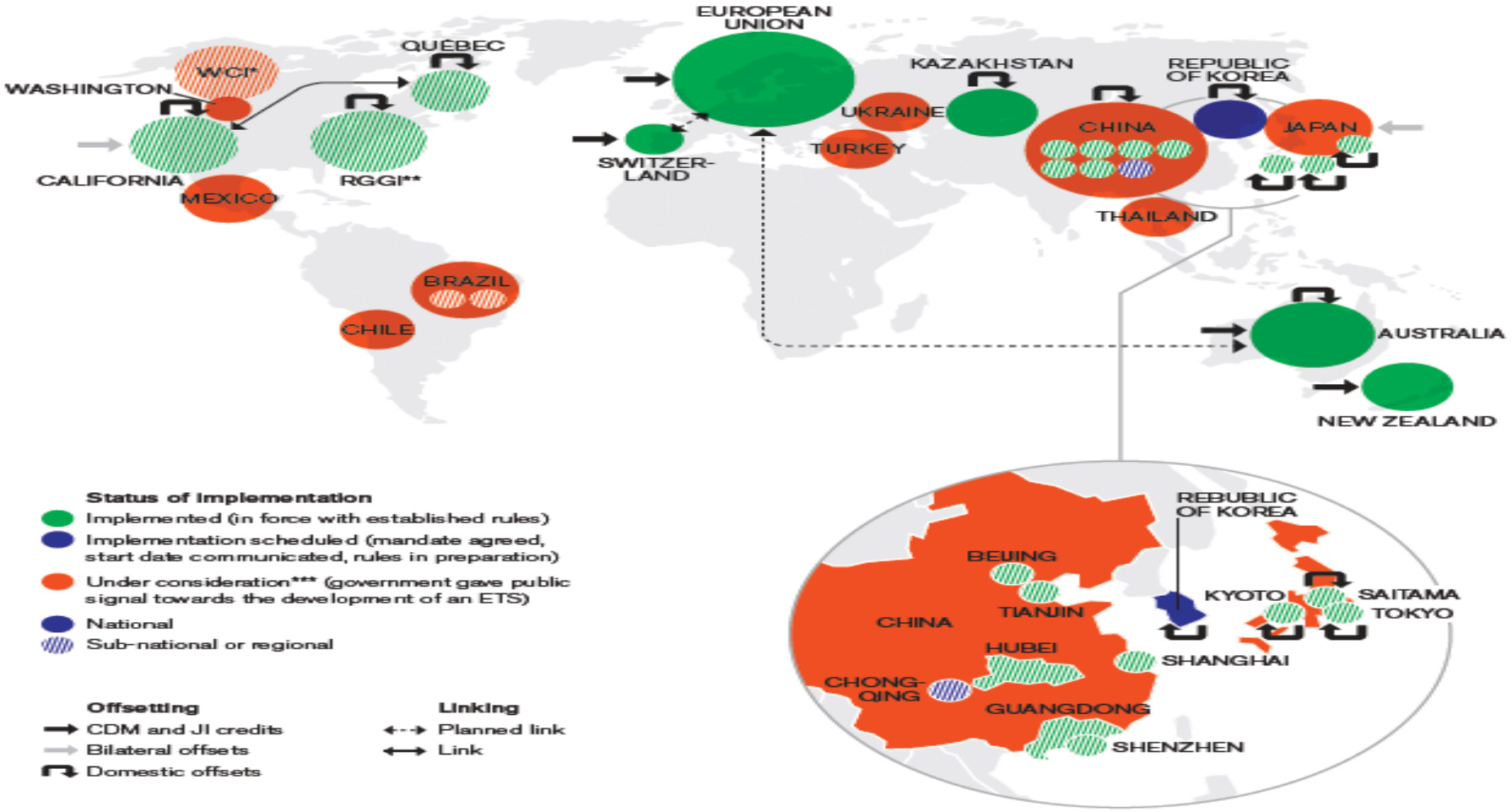
- hits the industrialisation process in emerging economies without preventing their lock- in carbon intensive growth pathways

- confronts the reluctance to large compensating transfers

« de-fragmenting » by direct market linkages?

- **Increase / reduce** economic efficiency? ecological effectiveness?
- **increase / reduce** political economy obstacles?

Figure 11 Map of existing, emerging, and potential emissions trading schemes



Source: State and Trends of Carbon Pricing 2014. World Bank

Limits to ‘forced’ interconnection of markets

- heterogeneous carbon prices reflect **deep institutional and social heterogeneities** leading to different political constructs
- **Connecting** very different types of systems **too quickly** generates **‘fault lines’** (Raghuran Rajan 2010) and **economic distortions**
- Beyond certain limits **intervention on market prices** might come to cool a fever w/o curing the infection and lead to **undesired outcomes**
- It **will not break the ‘glass ceiling’ on carbon prices** w/o degree an institution with a high political authority to block the lobbying games
- Comparing efforts to ‘guide’ the markets will be part of these games
- **Local experiences are useful but cannot be extrapollated too quickly**

EU-ETS: a good example of lobbying

Harmonized free allocation to industry and carbon leakage provisions

Share of free allocation calculated based on benchmarks per sector	2013	2014	2015	2016	2017	2018	2019	2020	From 2021
Electricity production	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industry sectors	80%	72.90%	65.70%	58.60%	51.40%	44.20%	37.10%	30%	View of 0% by 2027
Industry sectors deemed exposed to carbon leakage	100%	100%	100%	100%	100%	100%	100%	100%	Decreasing share

- Carbon leakage list
  - 2015-2019 (*adopted in 2014)*

Source: Climate Action, EU ETS Handbook, 2014

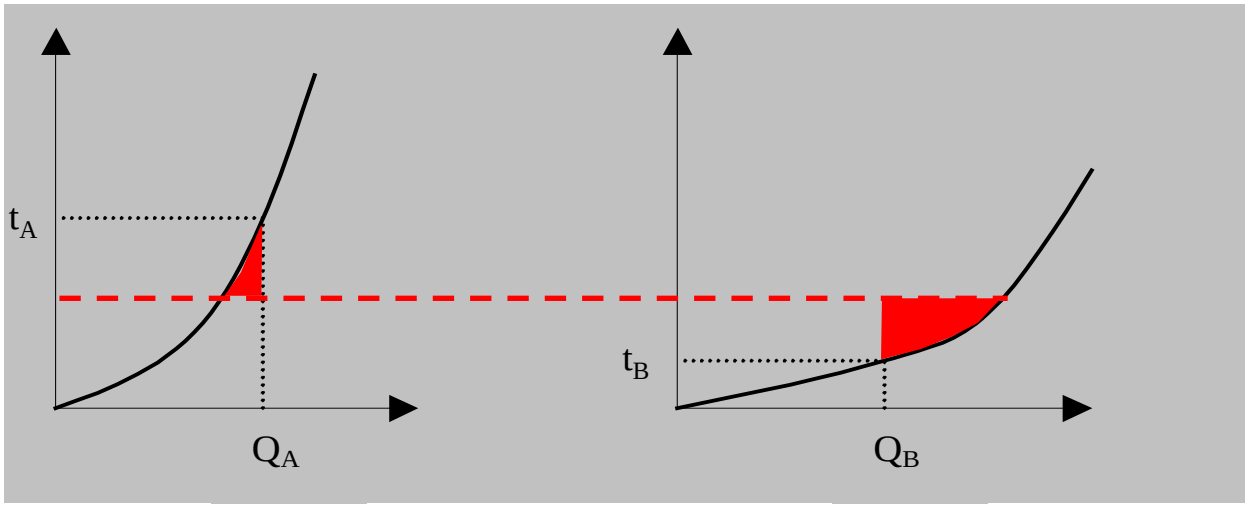
An deadlock? Back to the mental map and its lemma 2

The prices of carbon in ‘t’ indicate the consequences in ‘t’ of the previous decisions like a clock indicates the hour and it might be unwise to distort them

Question on Lemma 2: linking mitigation efforts is coordinating investment decisions but **carbon prices might not trigger LCI in due time** because of:

- **The ‘noise’ (country specific) of other price signals**
- **The ‘volatility’ of oil&gaz prices**
- **The ‘volatility’ of exchange rates**
- **The ‘shareholder value regime’**
- **The failures in capital markets and in financial intermediation**

Revisiting our mental map ….

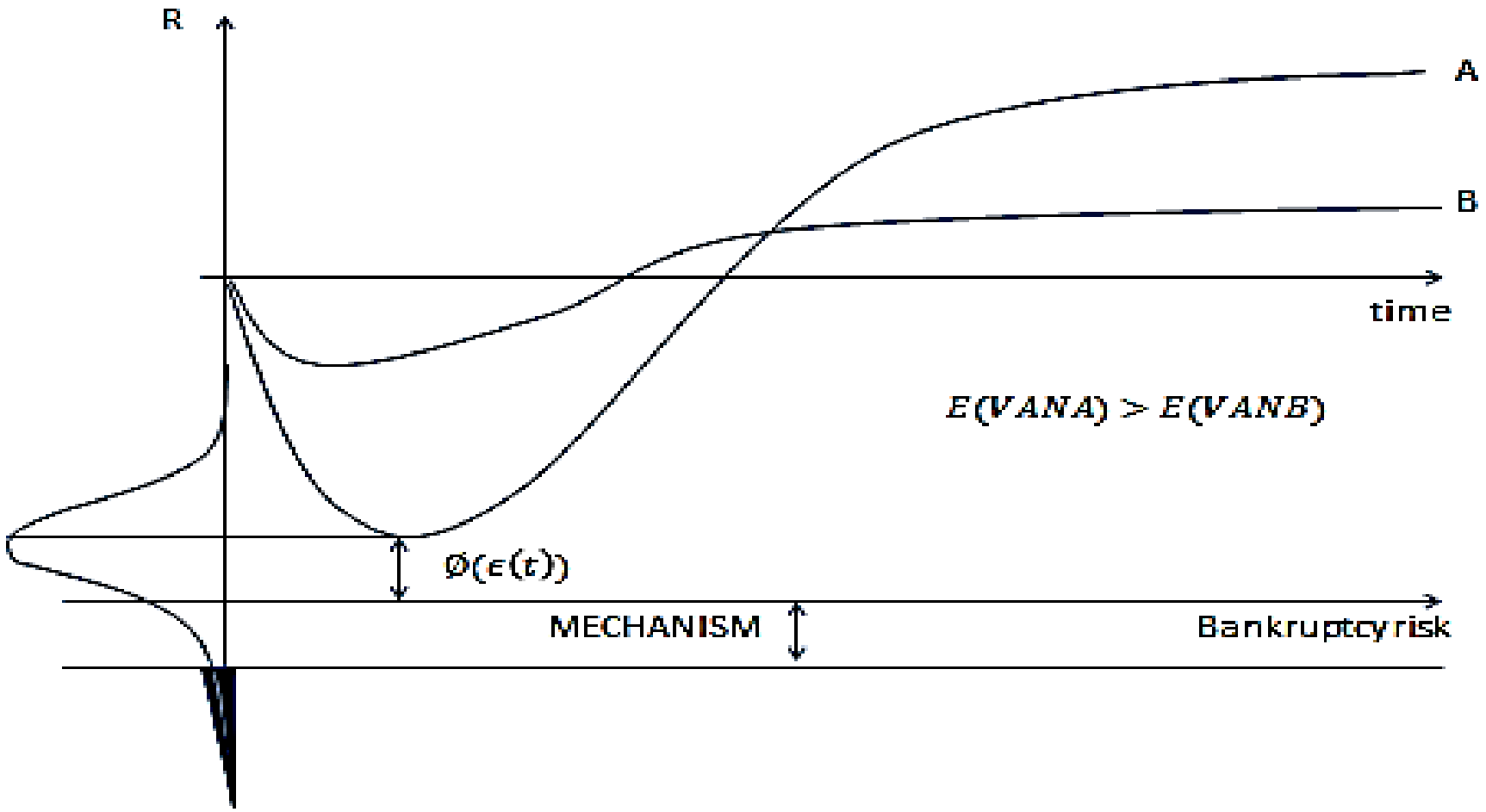


1. Cost curves: short terms costs or levelized costs?

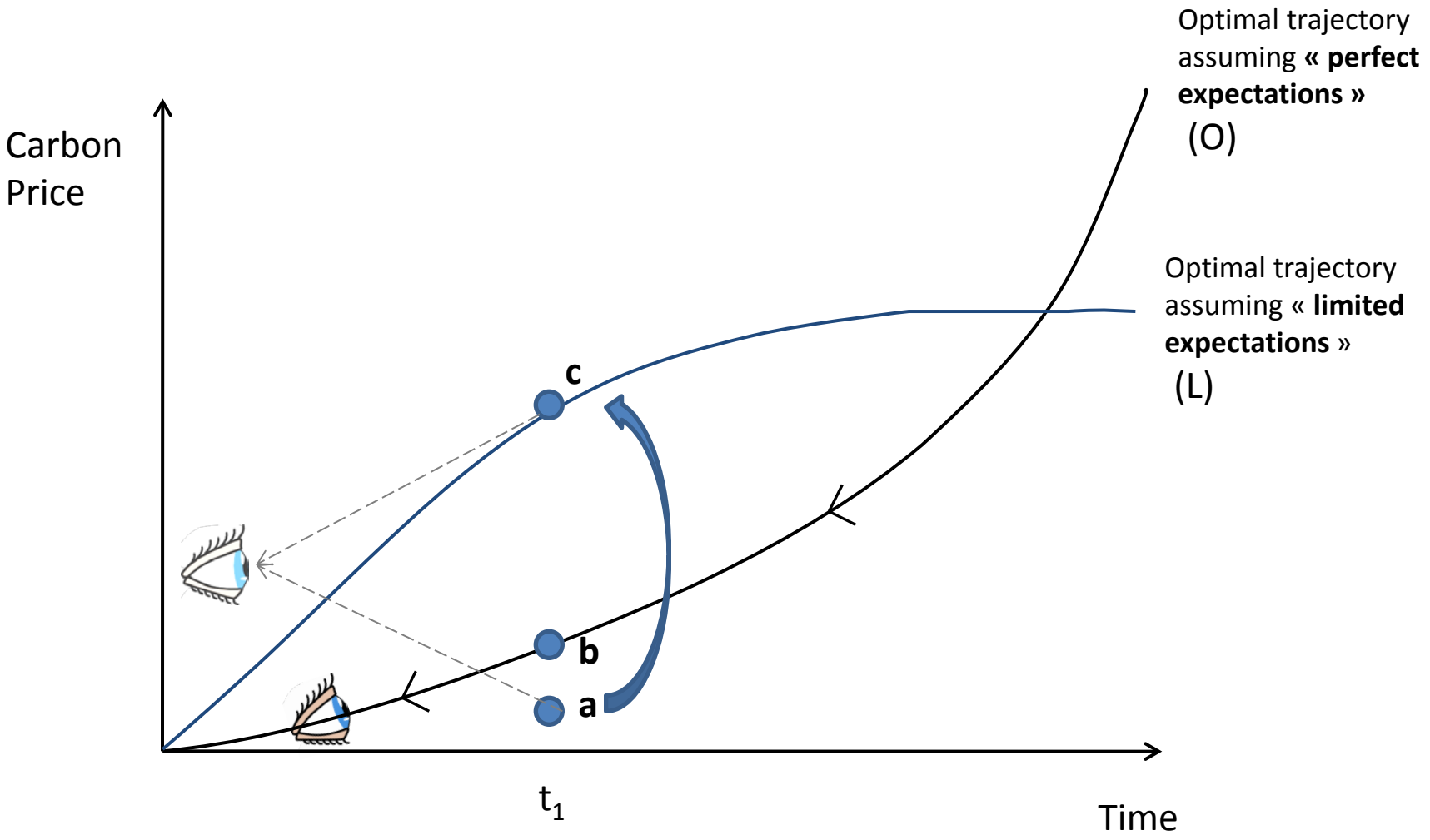
2. Are in a “shareholder business regime’ projects and technologies selected in decreasing merit order?

3. Is finance ‘neutral’ vis-à-vis technical choices? (metaphor)

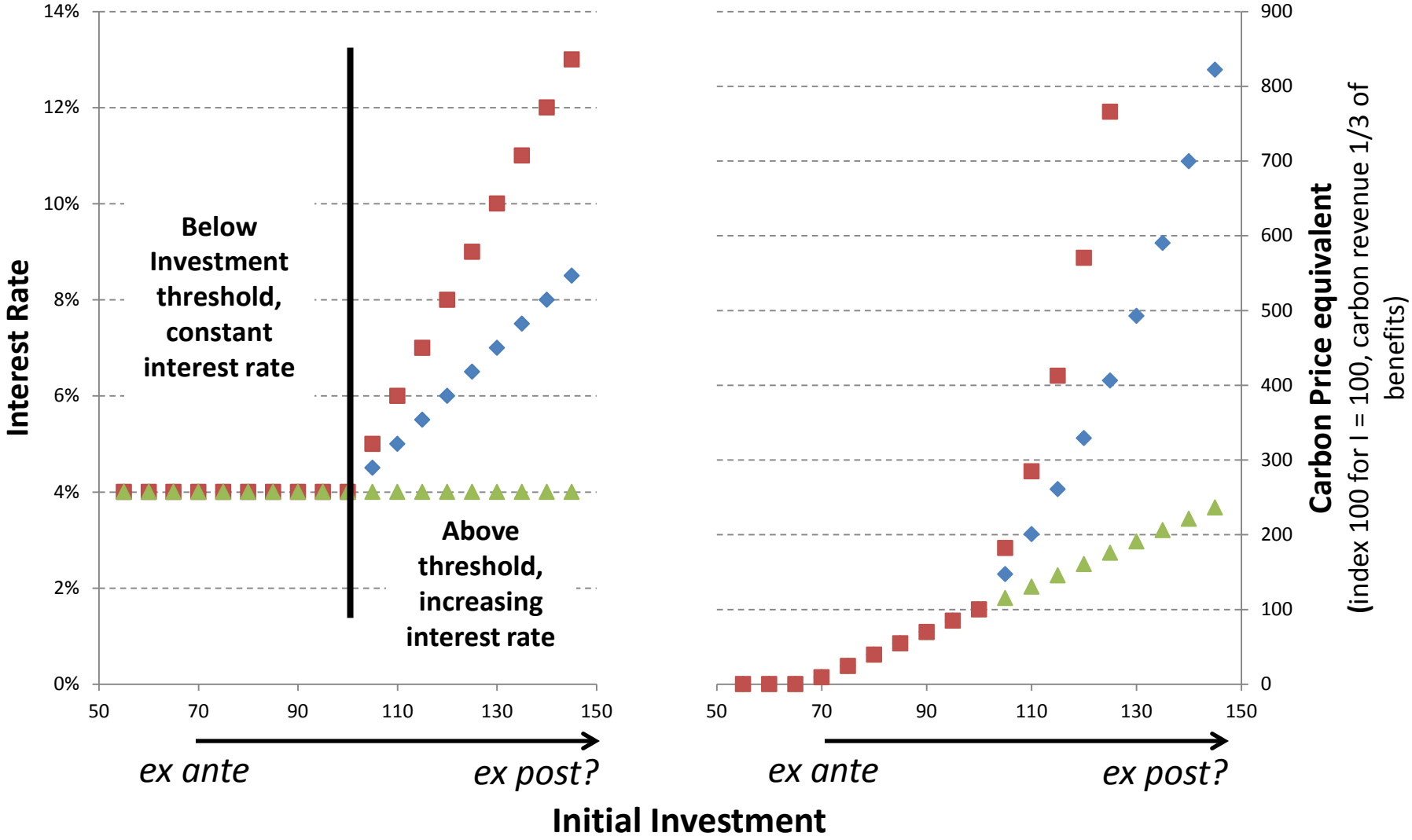
Guiding decisions in an uncertain world; two tools needed



Price trajectories under imperfect foresight



When interest rate increases, carbon price necessary to offset investment costs increases exponentially



Carbon prices and finance: securing consistency between these two signals

1. Internalizing the carbon externality through carbon prices
2. Relaxing the financial constraint on low carbon investments
3. Backing the financial devices of a world notional value of carbon which reflects the social value of avoided carbon emissions
4. Organizing the convergence between notional and real prices
5. Securing the economic consistency of 'non price policies'

Necessity of considering the current pressures on public budgets

A C.R.A. device

(Climate Remediation Assets)

Sketching a possible mechanism

1. ***Its anchor*** **:** an agreement, under UNFCCC on ***a Value of Climate Remediation*** (per ton of avoided carbon emissions***)***

2. ***Voluntary commitments, by 'clubs' of governements,*** to back a quantity of ***C.R.As*** over every five years

3. Central banks open ***credit lines*** and accept as repayment ***carbon certificates (CC)*** to fund LCIs

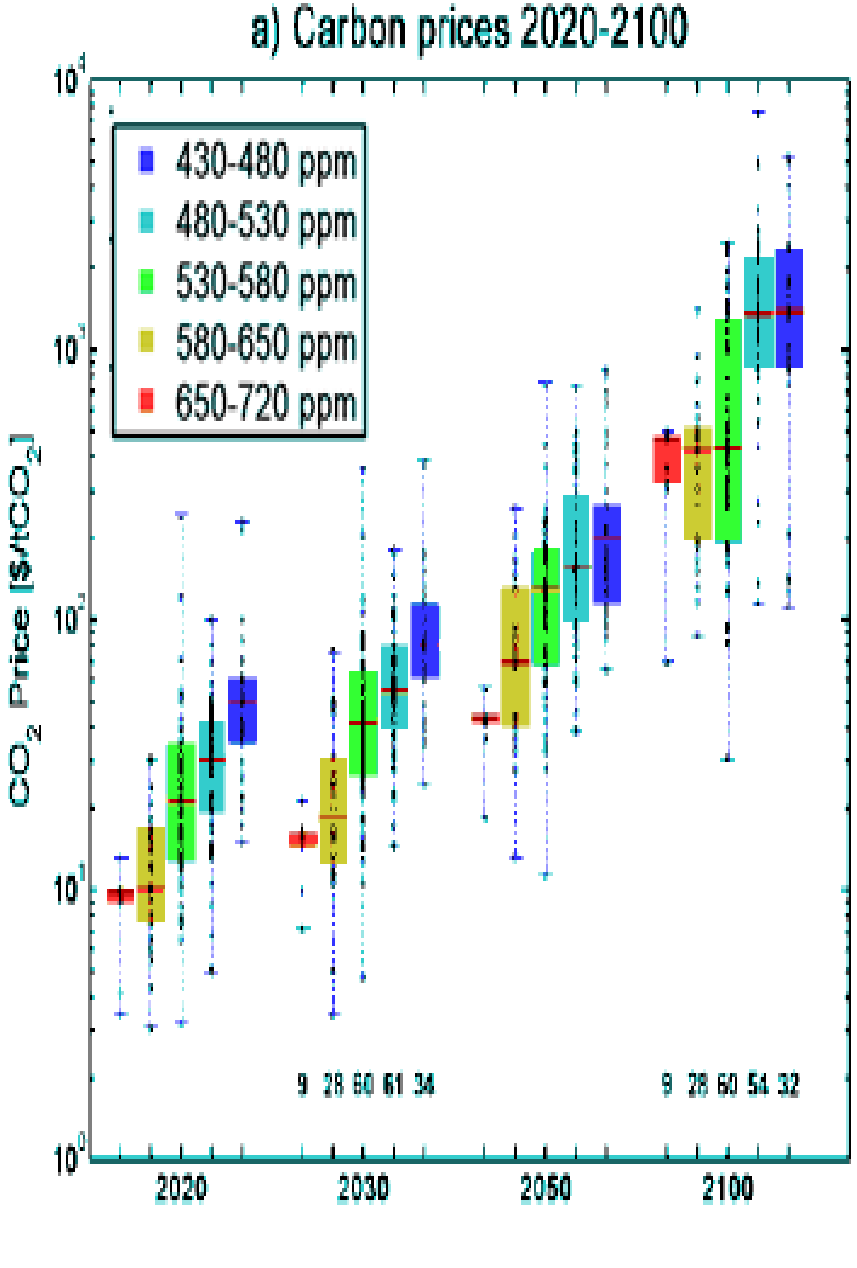
4. ***An Independent Supervisory Body*** to certify the eligibility of the projects in function of the **NAMA's** list and secure the ***statistical additionality*** of the system through the allocation rules of the CC

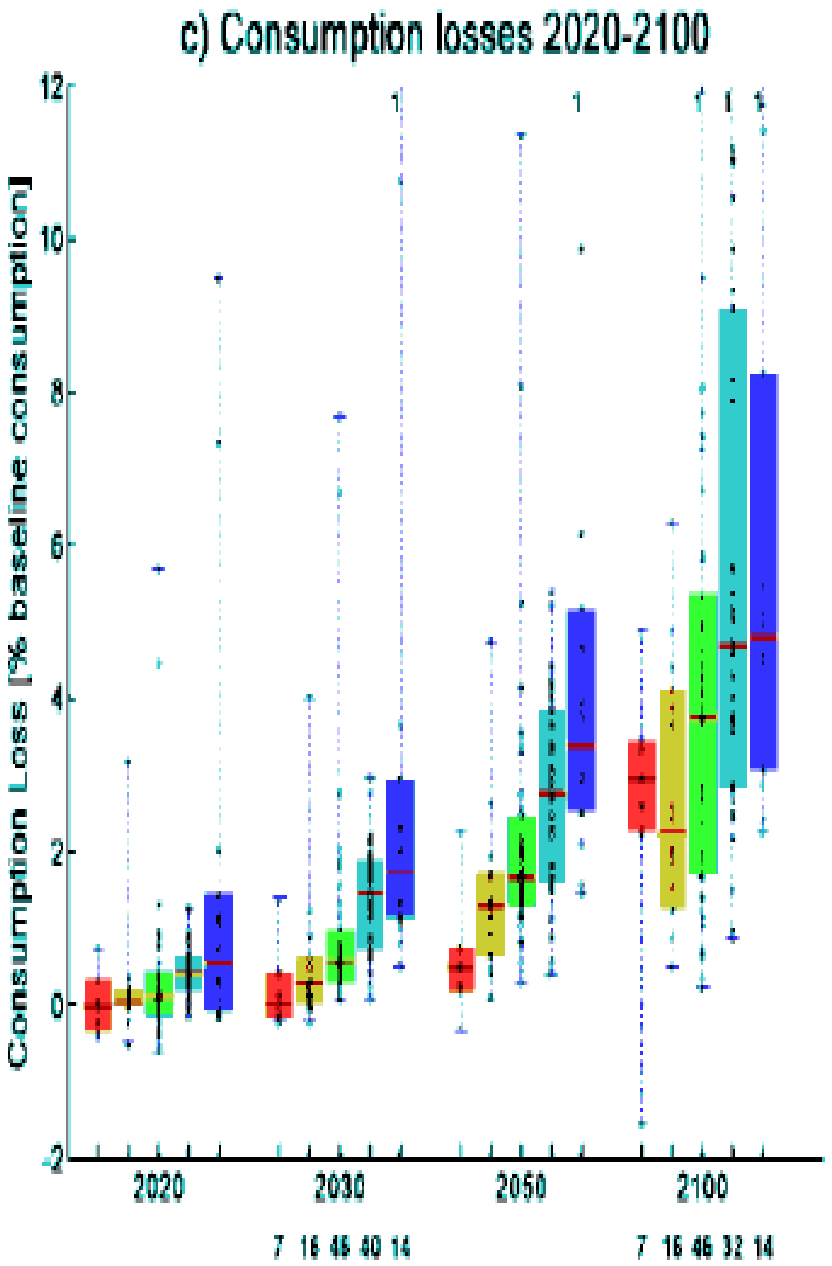
5. ***Asset swap after certification*** of project completion**: CC <-> C.R.A**
   C.R.As appear on the balance sheet of central banks (like gold)

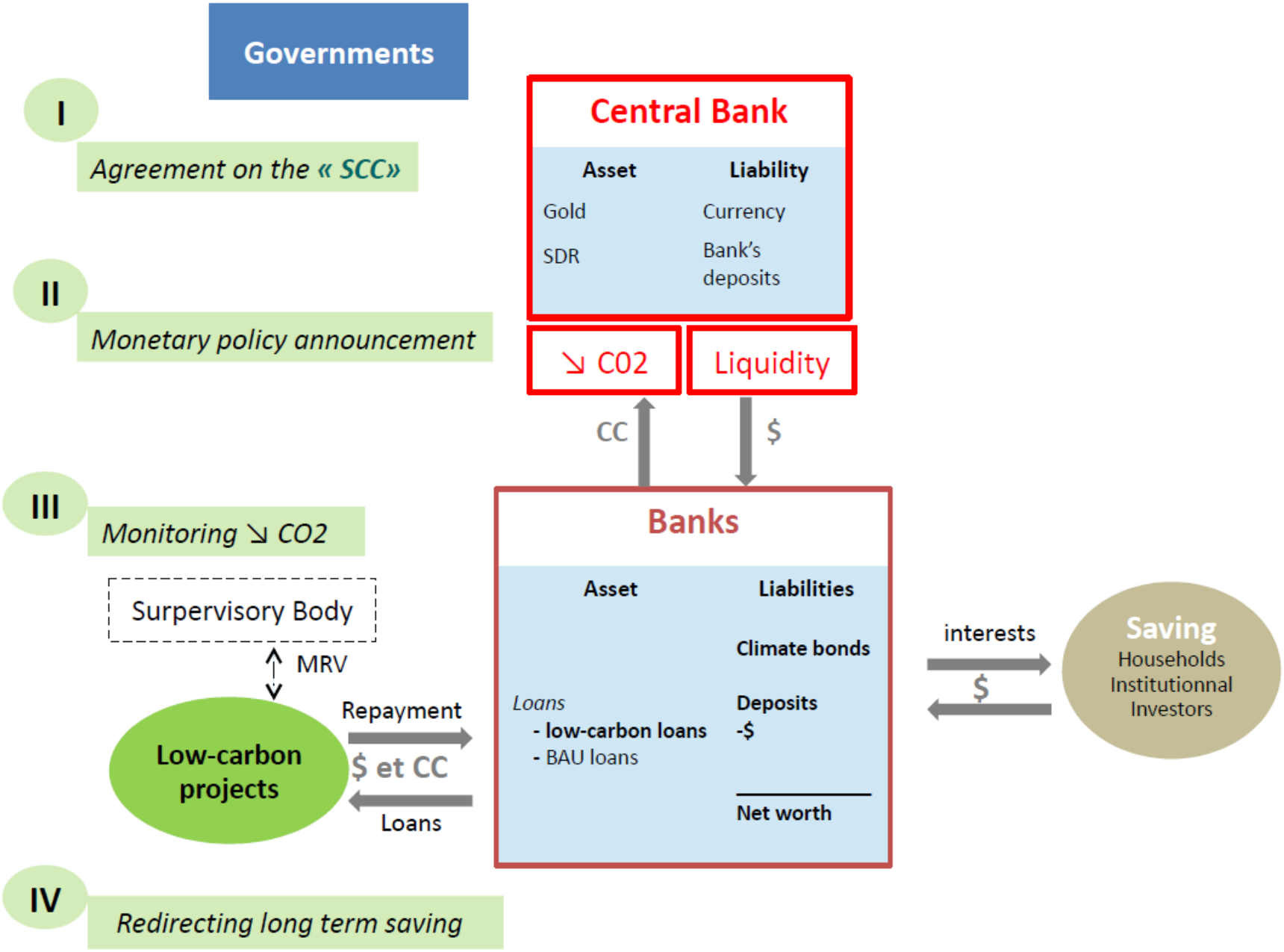
The VCRA: a notional value, not a carbon price

1. **A signal of the political will 'to do sth' against climate change**
2. **It increases over time -> counterbalance the role of discount rate against investing in long lived capital stocks**
3. **Surrogate of a « gobal price signal »:** it does not hurt existing capital stock and ***avoids the fragmentation*** of climate finance
4. **Politically negotiable** :

- The cost of cement in India will not be doubled by a 50$/t VCRA
- The VCRA differs across countries but is conditional upon the content of their development policies
- Countries may accept ***similar VCRA for different reasons,*** including various 'services' and 'side-benefits' of mitigation


a) Carbon prices 2020-2100
430-480 ppm
480-530 ppm
530-580 ppm
580-650 ppm
650-720 ppm
CO_2 Price [$/tCO$_2$]
9 28 60 61 34
9 28 60 54 32
2020
2030
2050
2100


c) Consumption losses 2020-2100
Consumption Loss [% baseline consumption]
7 16 46 40 14
7 16 46 32 14
2020
2030
2050
2100


Governments
I
Agreement on the « SCC»
II
Monetary policy announcement
III
Monitoring ↘ CO2
IV
Redirecting long term saving
Central Bank
Asset
Liability
Gold
Currency
SDR
Bank's deposits
↘ C02
Liquidity
CC
$
Banks
Asset
Liabilities
Climate bonds
Loans
- low-carbon loans
- BAU loans
Deposits
-$
Net worth
Surpervisory Body
MRV
Low-carbon projects
Repayment
$ et CC
Loans
interests
$
Saving
Households
Institutionnal
Investors

Gvt's commitments and issuance of carbon-based liquidity by Central Banks

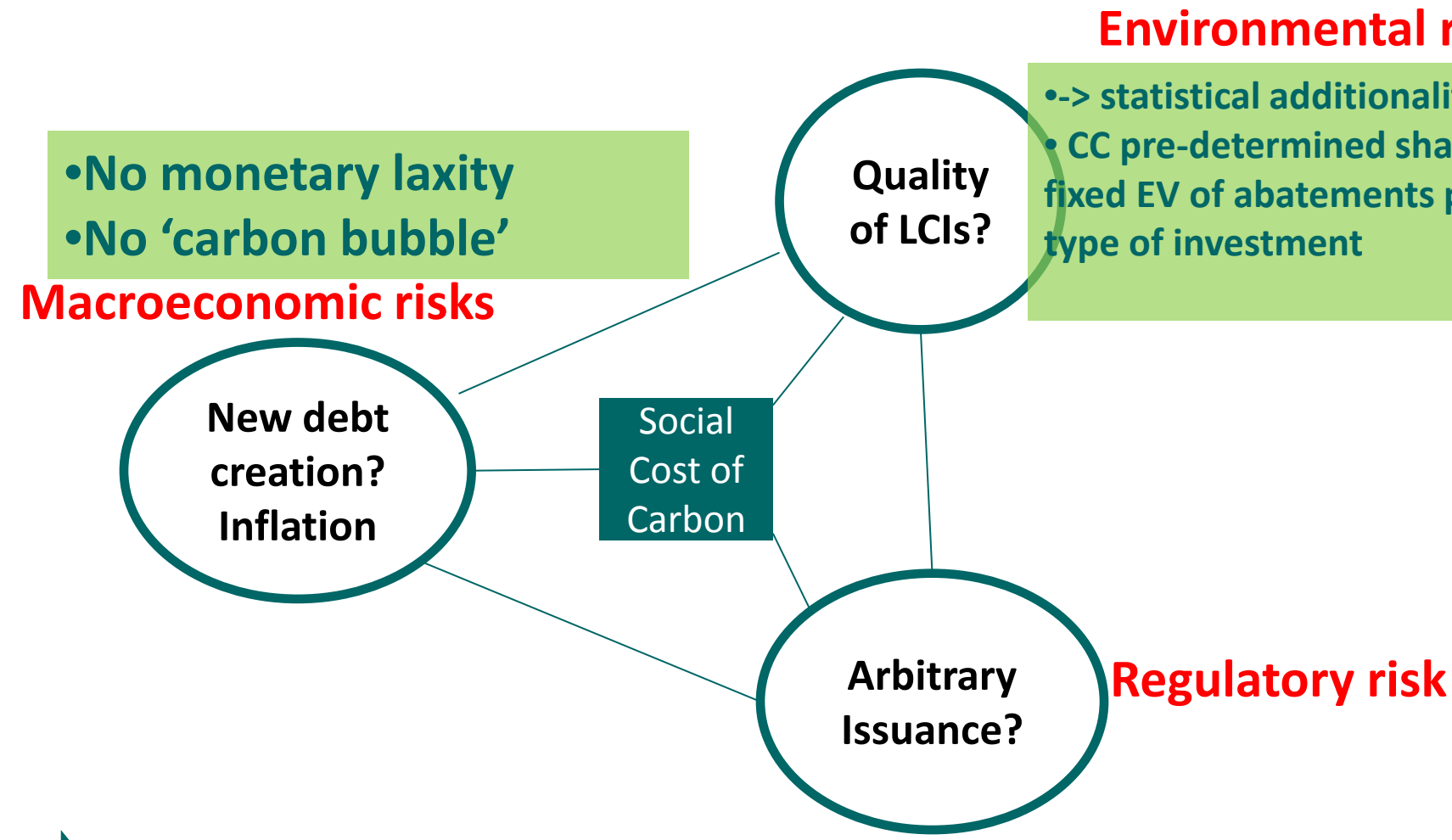
Central Bank balance sheet

Asset	Liability
Gold	Bills and coins
Sovereign bonds	Banks' deposits
% of Governments' "CO_2 commitment"	Liquidity drawing right

Out of balance sheet

New credit lines for commercial banks, refundable with ↘ of CO_2

Adressing potential risks of the system



To be weighed against the benefits of redirecting part of (misused) savings toward a « green growth » recovery

The political economy of the system

- Immediate strong signal for investors which will upgrade the volume of LCIs for a given carbon price
- Smooth the cost for public budgets: this is a public guarantee to investments backed on 'real wealth'
- Commits governments to an implicit foreward contract for higher carbon prices ; governments are interested in preserving the palatability of carbon assets through implicit or explicit carbon pricing
- It bypasses the existing vested interests and favor the emergence of new vested interests in low carbon activities
- It might interest the 'climate agnostic' policy-makers

The contribution to solving the 'linkage challenge'

- **The same value of carbon incorporated in investment choices guarantees the overall efficiency of long mitigation efforts**

- **Hedge against the risk of fragmentation of non price policies and of financial initiatives (including overseas assistance)**

- **A share of the proceeds can levied to:**
  - **Upgrade the GCF and provides a guiding principle to the GCF loans**
  - **Back an International Carbon Reserve to facilitate the progressive convergence of carbon prices**

Commonalities and differences with the ICAR approach

- Necessity of a robust MRV process to secure the **'comparability'** of carbon certificates in terms of **statistical additionality of abatements**
- **The 'exchange rate': a conventional 'alpha' to allocate CC**

$$NPV = \sum_{t_0}^{t_0+N} \frac{A(t).VAE(t)}{(1+i)^t}$$

$$\alpha \sim \frac{NPV}{VAE_{t0}}$$

- **To be calculated by type of projects and by 'regions'**
- **Only for Namas (for political reasons)**
- **No need of a central institution to launch the system**

The full study available at http://www.centre-cired.fr

See also

Venturing into uncharted financial waters: an essay on climate-friendly finance finance JC Hourcade, BP Fabert, J Rozenberg, ***International Environmental Agreements: Politics, Law and Economics*** 12 (2 ...

http://www.strategie.gouv.fr/sites/strategie.gouv.fr/files/atoms/files/bat_notes_danalyse_n24_

ANNEXES

CBDR and GCF at risks of the distrust?

- How to pass from 3G$ per year to 100G$ and 500G$ in a context of ***'depression economics', 'public debts'*** and ***rebalancing of the world economic equilibrium***:
  - exarcerbates the **'donor fatigue'** in the Annex 1 countries
  - Reinforces the **resistance** to carbon pricing (explicit or implicit)

- A problem of **orders of magnitude**
  - **Incremental Investments < 0,5% of the GDP in non O&G countries**
  - **leveraged** inv costs**< upfront** inv costs **< induced** inv costs
  - **Redirected investment = 8 to 9% of the Gross Capital Formation**

Turning the question upside down to mobilize the 'climate agnostic' policy-makers

- ***Because*** a massive redirection of investments ***concerns 40% of the economic sectors:***
  - ***Climate policies can stimulate an inclusive growth recovery***
  - ***Climate finance can't stay a marginal section of global finance***

Low carbon finance: a good candidate

- To **redirect savings towards infrastructure and industry**
- ***Revitalize the industrial fabric*** in OECD countries (and in the EU)
- ***More inward-oriented growth*** in emerging economies
- A **more resilient financial and monetary order**

Orders of magnitude

based on last ‘World Energy Outlook’ and macroeconomic simulations from Imaclim – R

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The nature of the funding challenge

1. **Cumulated Energy Related Investments in the US up to 2035**
   - BAU: between **5,5** and **6, 05** trillions US$
   - 450 ppm: between **5,83** and **6,39** trillion US$

2. **Cumulated Energy Related Investments in the EU up to 2035**
   - BAU++: between **4,94** and **5,25** trillions US$
   - 450 ppm: between **5,29** and **6,61** trillion US$

3. **Cumulated Energy Related Investments in the world up to 2035**
   - BAU: between **47, 44** and **54, 7** trillions US$
   - 450 ppm: between **39,68** and **43,17** trillion US

Orders of magnitude of the C.R.A.s issuance (in 2035)

	OECD	DC (Middle East Excl)
Total Energy INV	**988**	**1143**
Redirected INV	**494**	**571**
Need of Carbon Assets		
Leverage 5	**98**	**114**
Leverage 10	**49**	**57**

% of the total GDP **between 0.19 and 0. 30**