

# Banks and environmental sustainability: Some financial stability reflections

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HEC Montreal, Quebec, Canada

24-25 August 2017

*The views expressed here are those of the author and do not necessarily represent those of Bank of Spain or the euro system*

# Outline

- **General considerations**
- Quantifying Banks' direct exposures to transition risks
- Proposals
  - Reliable and fully harmonized statistical framework & Effective disclosure
  - Credit registers
  - Internalization of environmental aspects by PS
  - Carbon stress-test
  - New prudential regulatory requirements?
- Conclusions and policy considerations

# General considerations

The need for decisive policy action on climate change is broadly acknowledged

... since 1979

# UN Framework Convention on Climate Change December, 2015



November 2016, France's Société Générale has announced that it will stop financing coal-powered electricity plants starting from January 2017 (Goal: coal-fuelled share in power production financed by the bank to 19 % by 2020)

# General considerations

## - FSB (2015) classifies climate related risks:

### • Physical

- ✓ Direct impact of natural disasters related to climate change (e.g. Tiphones; drought; low-lying shoreline put at risk)
  - Impact on insurance liabilities and the value of financial assets that may arise from climate related events that damage property or disrupt trade → Insurance / reinsurance

### • Liability

- ✓ Parties who have suffered loss or damage from the effects of climate change seek compensation from those they hold responsible
  - Claims could come decades in the future, creating liabilities for carbon extractors and emitters and their insurers → Insurance / reinsurance



### • Transition

- ✓ Financial risks, which could result from the transition to a low-carbon economy
  - Changes in regulation, technology and physical risks could prompt a reassessment of the value of a large range of assets. The abruptness with which such re-pricing occurs could influence financial stability → Banks and asset management

# General considerations

## - Scenarios

- **Gradual and smooth**

- Economy smoothly endogenize changes associated with the transition. Overall bank credit quality and the performance of investment portfolios would be resilient during the transition (*Stern, 2008; Acemoglu et al. 2012*). This scenario implies that policy makers intervene:

- ✓ technology standards (e.g. emission limits)
- ✓ emission taxes as per unit of pollutant (prices): Mexico, Japan, Denmark, Finland, France, Norway, Portugal, Sweden
- ✓ quotas or transferable permits in a centralized government created market: EU, California and China (merging seven regional pilots into a national ETS (2017))

- **Late and abrupt.** Market signals for future investment are unclear and governments cannot provide market certainty (*Newell et al., 2014*)

# General considerations

## - A late and abrupt transition

- **GDP growth** could be impaired by the increase in energy prices (*Killian, 2014*), production costs as well as in the cost of capital (*Balders et alli, 2016*)
  - NiGEM
  - IMF WEO

## ➔ • **Direct exposure to “stranded assets” whose underlying value depends on the extraction/usage of fossil fuels and high environmental risk sectors (Moody’s 2015)**

- Mining - coal
  - Unregulated Utilities and Unregulated Power companies
  - Power generation
  - Oil and gas: refining and marketing; independent exploration and production.
  - Building materials
  - Chemicals-commodity.
  - Steel
  - Mining-Metals and other materials excluding coal
  - Automobile manufacturers
- Rated market debt issued = **USD 512 bill**
- Rated market debt issued = **UDS 1.5 trill**

- **Second round effects.** Disorderly transition could extend to the corporate bond and leveraged loan markets

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# Quantifying Banks' direct exposures to transition risks

- **Lack of clear internationally agreed definition of “green” vs “brown”** industries, this paper follows Moody's (2015) classification of rated debt for industry sectors with exposure to environmental risks
- Exposure of the largest **banks in the US, EU, Japan, China and Switzerland**
  - Thomson ONE financial database for syndicated loans outstanding (considered the bulk of the bank financing) on 31 December, 2014
  - 10 Largest banks with financial information available in SNL Financial and EU banks with financial information available in the ECB
  - Similar methodology used by Weyzig (2014) for EU banks. Banks' role as book runners for syndicated loans

# Quantifying Banks' direct exposures to transition risks

Total estimated value of outstanding loans to high environmental risk sectors as of December 2014 (USD mil)

Sector	US United States	EU European Union	CN China	JP Japan	CH Switzerland
Mining:coal	7,490	12,601	3,543	4,165	678
Unregulated Utilities and Unregulated Power companies	20,970	25,192	1,192	9,275	2,266
Power generation	120,979	201,931	23,547	79,976	14,819
Oil and gas: refining and marketing	199,107	215,285	14,470	83,903	20,581
Building Materials	10,861	24,303	828	26,768	1,326
Chemicals-commodity	44,224	62,178	7,316	43,613	7,010
Steel	19,348	22,867	2,019	15,464	2,286
Mining-metals and other materials excluding coal	19,656	27,318	6,797	12,427	3,329
Automobile Manufacturers	63,121	110,349	9,490	26,374	6,563
<b>Total</b>	<b>505,755</b>	<b>702,024</b>	<b>69,202</b>	<b>301,964</b>	<b>58,858</b>

# Quantifying Banks' direct exposures to transition risks

Banks' highest exposures to high environmental risk sectors by region					
	EU	US	Japan	China	Switzerland
Oil and Gas	(1)	(2)	(1)	(2)	(1)
Power Generation	(2)	(1)	(2)	(1)	(2)
Automobile manufacturing	(3)	(3)	(3)	(3)	(3)

(3) Chemicals-commodity

# Quantifying Banks' direct exposures to transition risks

Loans to high environmental risk sectors (% Total Assets of Banks) / Largest bank exposure (% Total Assets)	
United States	3.8% / 6.1%
European Union	1.4% / 8.7%
China	0.5% / 0.8%
Switzerland	2.1% / 3.4%
Japan	2.2% / 3.7%

# Quantifying Banks' direct exposures to transition risks

EU: Banks' highest exposures to high environmental risk sectors by Country				
	Germany	France	UK	Italy
Power Generation	(1)	(2)	(2)	(1)
Automobile Manufacturer	(2)	(3)	(3)	(2)
Oil and gas	(3)	(1)	(1)	(3)

# Quantifying Banks' direct exposures to transition risks

**Credit risk goes hand-in-hand with environmental risks: Total value of outstanding loans by type of lending instrument (\$ mil) (US, EU, China, Japan and Switzerland) December 2014**

Sector	Term Loan, Multi Loan Facility	Revolving and Overdraft Facility, Float rate rnts.	Project finance	Bridge Loan, capital and working capita facilities, adquisition	Trade finance	LT Debt (mezzanine, sub, boll) performance bonds
Mining: coal	16,091	10,665	-	199	1,522	-
Unregulated Utilities and Unregulated Power companies	16,415	39,763	132	2,234	350	-
Power generation	159,515	266,330	2,120	6,462	6,150	122
Oil and gas: refining and marketing	173,461	337,735	-	15,774	5,350	140
Building Materials	28,207	31,733	16	2,337	781	35
Chemicals-commodity	65,709	85,434	-	10,784	653	180
Steel	25,808	32,739	-	1,602	1,812	21
Mining-metals and other materials excluding coal	21,010	46,943	-	567	1,004	4
Automobile Manufacturers	72,586	129,745	-	11,584	1,814	151
<b>Total</b>	<b>578,801</b>	<b>981,087</b>	<b>2,269</b>	<b>51,543</b>	<b>19,436</b>	<b>654</b>

≈ 35%

Total committed amounts  
typically 5 yrs  
≈ 60%

# Outline

- General considerations
- Quantifying Banks' direct exposures to transition risks
- **Proposals**
  - ST {
    - Reliable and fully harmonized statistical framework & Effective disclosure
    - Credit registers
  - MT {
    - Internalization of environmental aspects by PS
    - Carbon stress-test
    - New prudential regulatory requirements?
- Conclusions and policy considerations

# Proposals

## 1- A reliable and fully harmonized statistical framework as well as effective disclosure

- The NACE Rev 2 (at least two digits), which is directly linked to the International Standard Industrial Classification (SIC) of United Nations (Rev 4) (four digits) classification frameworks allow for the identification of economic activities exposed to risk in the transition to a low carbon economy
  - In practice, banks in a number of countries use credit classifications of 4 digits NACE Rev2
  - However, ...
    - *Internal Capital Adequacy Assessment Process (ICAAP)* but not necessarily regularly assess the impact of environmental risks (e.g. EU)
    - Call reports include sector classifications of only 1 digit (e.g. EU) **Insufficient!!!!**

# Proposals

- **Effective disclosure requirements**

- Key role in improving governance by improving transparency for investors
  - In the EU: requires disclosure of non-financial information referring among other “to environmental aspects” *Directive 2014/95/EU*
  - Task Force on Climate-related Financial Disclosures (TCFD) delivered final recommendations to the G20 and supplemental Guidance for the financial sector (including banks) in June, 2017
    - Financial disclosures should be provided in **banks’ main stream or public financial fillings** with strong focus on banks’ credit, liquidity, market and operational risks **as well as opportunities and risks related to transition to a lower –carbon economy** and that **financial disclosures** should be designed to solicit decision useful forward looking information on financial impacts
      - TCFD puts environmental risks at the same level of banks’ credit, liquidity, market and operational risks

# Proposals

## 2- Credit registers that regularly collect granular credit risk data from banks and other credit institutions

- Database with individual creditor information on economic activities and subsectors; structure (e.g. project finance) and risk patterns of credit granted by the financial sector (e.g. PD, impairments, maturity, currency, interest rates)
  - Example: ECB launched a credit register called *Anacredit*, (e.g. credit classifications of 2 digits NACE Rev2) → Valuable tool for “carbon stress testing”

# Proposals

## 3- Banks' PS internalization of environmental risks in their governance systems and procedures as well as in the banking regulatory framework → Revision BCPs + Guidelines for assessors

- Governance of bank supervision (e.g. licensing criteria; internal control and audit)
- Prudential regulation: disclosure and transparency requirements (e.g. Pillar 3 disclosures)
- Risk assessment process of banks (e.g. US, the Office of the Comptroller of the Currency's guidelines supervision "*Oil and Gas Exploration and Production Lending*")
- International coordination (e.g. cooperation also encompasses home and host PS' exchange of info on banks' risks exposure to environmental risks as well as systemic risks related to the disorderly transition to a low carbon economy)

# Proposals

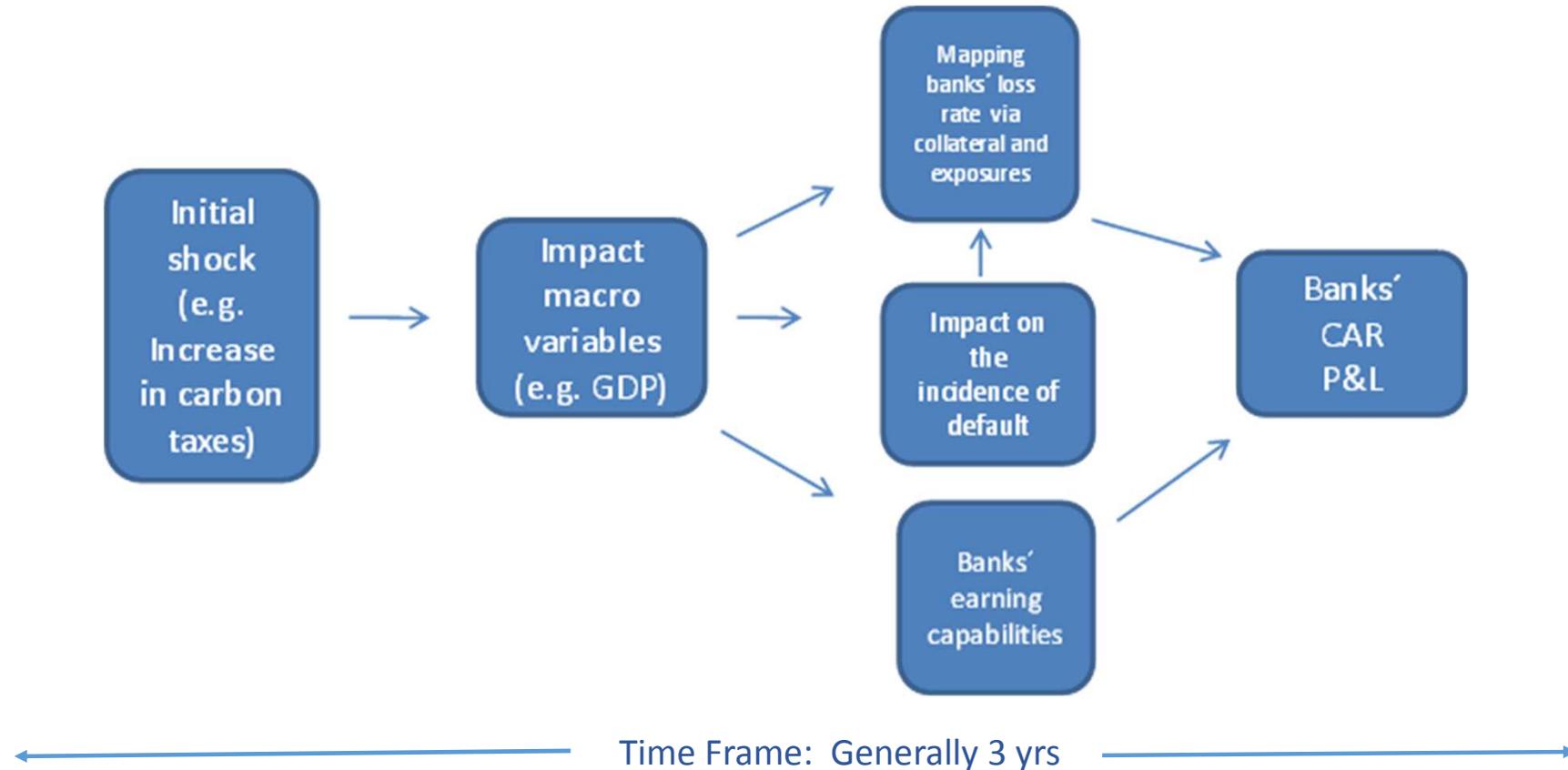
## 4- Carbon stress test

- Assess the impact on banks' capital and profitability of an adverse scenario consisting of a disorderly transition to a low carbon economy that could affect systemic risk

Information:

- ✓ Banks' management (TCFD, 2017)
- ✓ Prudential Supervisors

**Stylized representation of “carbon stress test”:  
View of the way in which a shock might impact banks’ CAR and P&L**



# Proposals

- **Carbon stress test:** Environmental risks as a driver of credit risk

$$NPL_{i,t} = \alpha_0 + \beta(\text{Climate factor})_{i,t} + \alpha_1 NPL_{i,t-1} + \sum_{s=0}^K \beta F_{t-s} \text{ MACRO } F_{t-s} + \varepsilon_{i,t}$$

**NPL<sub>i,t</sub>** logit transformation of NPLs as a ratio over total loans of credit institution *i* in year *t*

**α<sub>0</sub>** stands for the fixed-effect for credit institution *i*

**β** gauges the specific climate factor *i* in year *t*

**Climate factor** for a particular sector (e.g. value of stranded assets due to new disruptive technologies over profits before taxes)

**MACROF<sub>t-s</sub>** stands for macroeconomic factor *F*, in period *t-s* (*s* is the time lag) (GDP growth and long-term interest rates but could also include sector economic variables)

# Proposals

- **Climate factors:** Three primary credit effects from carbon-reduction policies for non-financial corporates (Moody's, 2015)

- *Regulatory risks*

- ✓ If regulations are known and transparent the future credit impact is reasonably visible
- ✓ When regulations set a target (e.g. to achieve a certain percentage of power from renewable sources or percentage reduction in emissions) with unclear repercussions ...uneven playing fields or reduced visibility regarding which issuers' credit profiles will be affected

- Prohibition on certain activities (e.g. closure of all German nuclear generating stations in 2022)
- Incentives for certain technologies or production modes at the expense of others (e.g. renewable sources of energy)

- *Disruptive technology shocks*

- Negative impact on incumbents with limited capability to adapt their business models (e.g. internal combustion engine vs Lithium batteries)

- *Direct costs*

- Imposition of carbon taxes or purchase of carbon permits e.g. carbon-emitting plants that incur carbon taxes, plants that must buy emissions credits to operate and plants that must install environmental equipment to continue to operate

# Proposals

- **Environmental risks coexist** with other drivers of credit risk
  - Rating agencies consider environmental risks *vis-a-vis* other issuer or sector characteristics that may mitigate or exacerbate their impact (Moody's 2015)
    - Climate risk factors particularly relevant for “high environmental risk sectors”

# Proposals

## 5- New prudential regulatory requirements?

- **Loan loss provisions:** If the impact of environmental risks results in expected credit losses of bank exposures
- **Capital requirements:** If environmental risks have a permanent impact through the economic business cycle increasing the long term PD of exposures to elevated environmental risks
- **Limits to large exposures:** Quantity based or price based constraints (or combination) on the amount of exposures with elevated environmental risk
- **Transparency requirements:** enhancements to the Pillar 3 disclosure requirements (Basel III) which could include semi-annual disclosure requirements related to environmental risk exposures and their risk weights

# Proposals

- **Loan loss provisions** → IFRS 9
  - $LLP_e$  (environmental risk) are added to  $LLP_{cr}$  (credit risk)
  - Provision individual vs collective (internal methodologies / supervisor)
  - Stages 1 , 2 (special surveillance) and 3 (default)

# Proposals

- **Capital requirements** → Minimum capital requirements based on the carbon intensity of individual exposures
  - Asset risk weights aimed at curbing banks' incentives to accumulate exposures subject to elevated environmental risks (penalization)

Problems:

- Difficulty of calibrating impact of environmental risk in RW
- May not be sufficient to promote change in bank behavior
- May not be sufficient in case of severe shocks due to abrupt transition

# Proposals

- **Limits to large exposures** →

Problems:

- Difficulty of calibrating RW
- May not be sufficient to promote change in bank behavior
- May not be sufficient in case of severe shocks due to abrupt transition

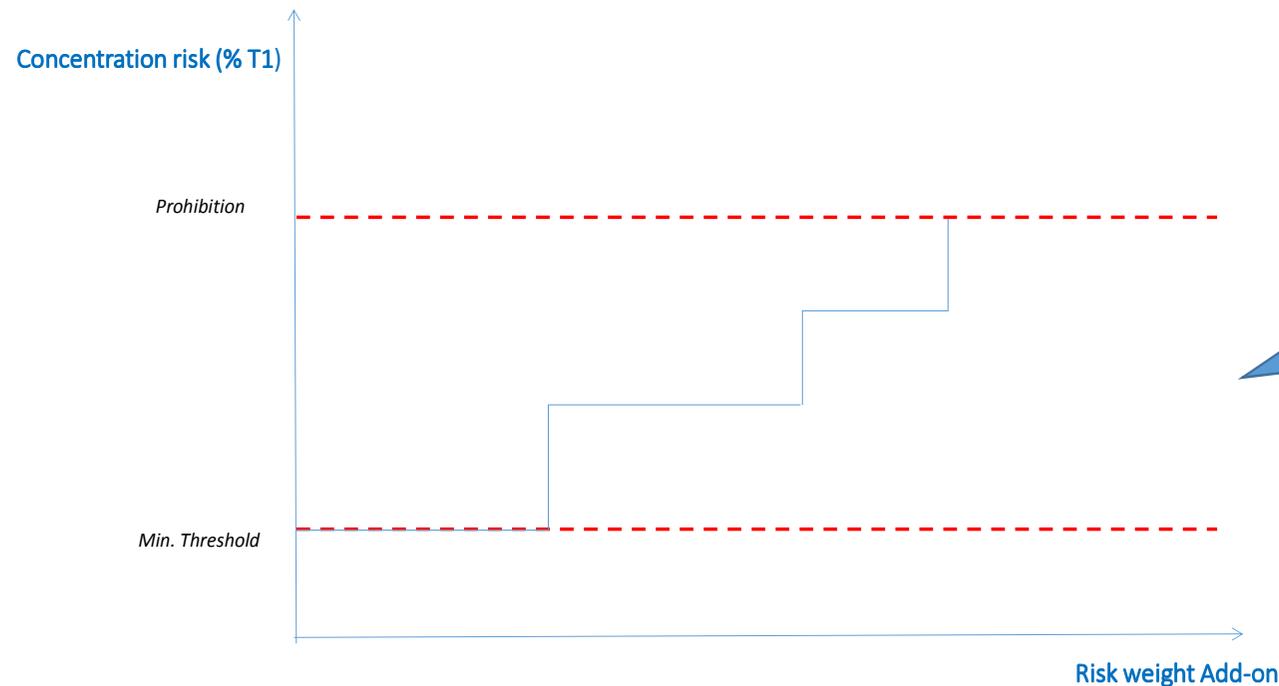
- Quantity based large exposure limit sets a hard limit on exposures relative to a bank's Tier 1 capital at a level which would trigger a supervisory response
- Price based constraints set risk-weight add-ons based on the amount of a bank's exposures to corporate / sovereigns exposed to high environmental risk relative to a bank's Tier 1 capital

# Proposals

Problems:

- Difficulty of calibrating RW
- May not be sufficient to promote change in bank behavior
- May not be sufficient in case of severe shocks due to abrupt transition

- Disincentives could be based on **risk-weight add-ons on incremental steps** as large exposures increase as a percentage of Tier 1 capital instead of a flat risk-weight add-on (25%)



The calibration and number of thresholds and risk weight add-ons would be determined in the context of a quantitative impact study, with a view to accommodating diversity across countries

# Proposals

- ... **most PS in the G20 countries do not believe** that minimum capital requirements (or prudential regulatory requirements in general) should be used to limit environmental risks (*Alexander, 2014*)
  - Brazil and China have begun to investigate under Pillar 1 of Basel III whether environmental risks are a material driver for credit and other types of financial risks

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# Conclusions and policy considerations

- **Banks** are immediately **affected** by the financial risks associated to the **disorderly transition to a low-carbon economy**, which could affect banks' exposure to systemic risk both via impaired GDP % and via banks' exposure to elevated environmental risk assets
- This paper recommendations **contribute to make operational** the **core elements of recommended climate-related financial disclosures** of the June, 2017 Final Report of the Task Force on Climate –related Financial Disclosures (**TCFD**) to G20 countries

## Core Elements



Source: Task Force on Climate Related Financial Disclosures, June 2017

- ✓ Banks' public financial fillings with strong focus on risks related to transition to a lower –carbon economy
- ✓ PS should internalize environmental risks in their governance systems and procedures → Revision BCPs
- ✓ Treatment of actual and potential impacts of climate-related risks: Provisions, capital requirements, limits on credit concentration (?)
- ✓ Calibration of asset risk weights aimed at curbing banks' incentives to accumulate exposures subject to elevated environmental risks (penalization)
- ✓ Credit registers that regularly collect granular credit risk data from banks and other credit institutions
- ✓ Carbon stress test to assess the impact on banks' capital and P&L of an adverse scenario consisting in a disorderly transition to a low carbon economy that could affect systemic risk

Thank  
you!!

