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Political Economic Solutions for Climate Change Consequences: The (Potential) Role of the Insurance Sector

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THE CLIMATE CHANGE ISSUE UNDER LAW AND ECONOMICS LENS

- Extreme weather patterns are causing major damage on property and business and the question of who pays is becoming a serious issue.
- A law and economics point of view focuses on the problem that emitters of greenhouse gases externalize the true costs of their contribution to climate change .
- Efforts to recover these costs, which manifest both through the costs of impacts and the costs of efforts to prevent impacts, imply relevant roles for the insurance sector and, because the insurance sector is the world's largest industry, the response of insurers to the broader climate-change challenge will no doubt be key to, at least partially, solve this internalization problem.

THE ROLE OF THE INSURANCE INDUSTRY

- Particularly, insurance sector could play a relevant role in different directions. Insurance industry, as tradition, supplies policies covering claims of third-parties who allege injury or property damage.
- But not only this, insurance companies are in challenge to design financial products aiming to finance technological responses to climate-change (mitigation and adaptation strategy).
- Moreover, insurers can induce an indirect effects in proactively stimulating climate change prevention behaviour related to their customers.
- In all these directions, the insurance industry is dealing with management risk activities.

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THE CHOICE BETWEEN ENVIRONMENTAL POLICY INSTRUMENTS

- On a political economic point of view, governments are facing the issue to introduce policies to tackle the causes and cover the rising costs associated with climate change effects.
- The environmental policy choice involves the assignment of respective roles of private and public sector to provide compensation and incentives to reduce the risk of catastrophic losses and financial management of large-scale disaster risks .
- The choice of both public and private instruments is essential given that in the case in which the government do not provide any policy instruments to prevent the events and to compensate the victims, the costs of natural catastrophes fall on the individuals.

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COMPARISON OF INSURANCE COVERAGE FOR STORM AND FLOOD DAMAGE IN MAJOR INSURANCE MARKETS

Country	Insurance coverage	Degree of state involvement
UK	Insurance covers all natural perils including floods, windstorms, and subsidence. Good uptake (> 90%) as required as a condition of mortgage.	None – primary insurance and reinsurance provided through private market.
France	Storm coverage included as standard. All policyholders pay premium surcharge set by the government (12% of the fire premium for most lines of business). Natural catastrophe coverage is mandatory.	Unlimited government guarantee for catastrophes provided through Caisse Centrale de Réassurance. Catastrophes Naturelles (CATNAT) is the national programme which covers floods, subsidence, mud slides, earthquakes, tidal waves and avalanches.
Germany	Storm coverage included as standard. Insurance for natural catastrophe is optional and available from private insurers for an additional premium. Flood uptake is typically low (~ 5%). Natural catastrophe coverage is not mandatory.	None
Rest of Europe	Each market has its own limitations on coverage. Extent of uptake varies by maturity of market, and degree to which cover is required by law or as a condition of other finance-providers (e.g. mortgage lenders).	State does not normally intervene in insurance provision but some countries have a pooled system through the government (e.g. Spain, Norway, Switzerland, Denmark). In the Netherlands, the government acts as insurer of last resort for flood, as the private market does not provide.
Japan	Property policies cover windstorm.	Primary insurance and reinsurance provided through private market.
Australia	Property insurance coverage is available for most perils, with subsidence generally excluded for residential policies. Scope of cover varies from company to company and can range from full (river) flood cover to local flash flood or storm-water only. Few companies offer however full cover for domestic risks.	Primary insurance and reinsurance provided through private market.
USA	Most property insurance policies cover wind damage. Flood is usually excluded.	The federal government covers flood perils. For hurricanes, insurance is provided through the private market. In Florida, primary insurers may purchase reinsurance from the Florida Hurricane Catastrophe Fund.

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PUBLIC VERSUS PRIVATE POLICIES

- Alternatively the government can carry the risk directly or as “insurer of last resort”; in this case, the costs of weather events are borne by the taxpayer, contributing according to the tax-regime of the country.
- Or private sector can, at least partially, cover weather risks and the costs of climate change will be shared among a portion of society.
- This last “private” solution can be achieved by the insurance industry involvement.
- In some cases, the private market covers much of the risk (e.g. UK), while in others, the government is more closely involved, either directly carrying the risk (e.g. USA for flood) or acting as “insurer of last resort” (e.g. France).

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PUBLICLY SUPPORTING PRIVATE POLICIES

- Public policies can support insurance sector in different ways:
 - by providing mandatory regime for insurance (e.g. mandatory catastrophe insurance coverage included in basic property insurance policies such as homeowners);
 - by providing State guarantee to limit private sector exposure and to reduce the cost of capital (e.g. special government disaster funds);
 - by creating a regulatory framework that allow private insurance market to work properly (special fiscal treatment for disaster insurance premiums, possibility of tax-deductible reserve funds).
- Moreover for insurance industry that may have limited capacity, a pooled or government-backed compensation system is the only way to deal with the substantial costs of natural catastrophes.⁷

EX ANTE AND EX POST POLICIES

- Another important distinction is between ex ante and ex post instruments as complements or substitutes.
- The political economy theory uses to compare two kinds of instruments, namely ex ante and ex post instruments: the first correspond to the design of an incentive regulation framework, the second of a compensation system for damage.
- This last kind of ex post instruments provide compensation to victims while internalizing the social costs of harm producing activities, the individuals harmed by climate change consequences receive a proper and complete compensation, possibly through an insurance provider. But insurance as ex post kind of policy instrument could give indirectly an incentive to take precaution with ex ante effects.

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DIFFERENT INSURANCE PRODUCTS

- First of all, climate change consequences are insured through the coverage of the risks that insurance industry accepts from clients, since climate experts predict changes in the intensity and distribution of extreme weather events (especially water-related and storms), and because of the resulting risk of catastrophic property claims.
- Within the “traditional” activity supplying coverage for the climate change consequences, other business opportunities emerge for all type of customers (private, commercial, industrial).
- This kind of products constitute the core business of the insurance industry.
- But specifically in the case of climate change many problems arise:
 - Problem of solvency of insurers as more severe weather becomes more common and overall variability of conditions increases.
 - Uncertainties in assessing climate change’s as a result, where a risk has significant ambiguous components.
 - It is likely that many climate change-related risks are correlated, creating a skewed risk pool and exacerbating the risk of extremely large losses.

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IMPORTANT CLIMATE CHANGE-RELATED RISKS AND OPPORTUNITIES FOR INSURERS

Insurance class/ line of business	Risks (from climate impacts, policy implementation, or policy failure)	Opportunities (from proactive policy or climate impacts)
Property	<ul style="list-style-type: none"> • Unprecedented accumulation of extreme events threaten solvency/liquidity • Getting cover may become harder • Lack of capital/reinsurance • Inaccurate risk pricing • Misinformed response from public sector • More costly repair-work 	<ul style="list-style-type: none"> • More demand for insurance and alternative risk transfer • Risk differentials can be priced • Insurance of “Kyoto” projects • Administration of disaster recovery • Prototype equipment can be insured
Casualty	<ul style="list-style-type: none"> • Unexpected claims for duty of care • Product failures in new conditions • Disruption to transport (extreme events) 	<ul style="list-style-type: none"> • Cover for professional services to carbon markets • “Green” transport products such as low-mileage motor policies
Life/health/ savings	<ul style="list-style-type: none"> • Episodic impacts on human health • Underestimating human life expectancy due to warmer winter in northern hemisphere • Reduced disposable income due to disasters 	<ul style="list-style-type: none"> • More demand for health cover • Growing wealth in developing markets due to technology transfer
Other underwriting	<ul style="list-style-type: none"> • Increased losses from business interruption, e.g. due to failure of public utilities • Disruption to leisure events • Increased losses in agro-business • Novel technology in energy sector 	<ul style="list-style-type: none"> • Alternative risk transfer (catastrophe bonds etc.) • R&D risks for low carbon technology • Consulting/advisory services • Insurance for emissions trading • Trade risks for technology exports • Carbon becomes an insurable asset

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FINANCIAL RESPONSIBILITY

- Also a system of compensation fund is established, such as a special government disaster funds within the target to promote framework of contingency measures to tackle climate change consequences .
- Other insurance products could provide also ex ante commitment of financial resources, such as the so called “financial responsibility” products. With this term, we consider all the tools that require polluters to demonstrate ex ante sufficient financial resources to correct and compensate for environmental damage that may arise through the activities of a firm.
- Financial responsibility is usually required as an integral part of some kind of ex ante regulation, to ensure that the damaged natural resources are made good.
- In the presence of informational issues, financial responsibility can also be seen as a solution to asymmetric information problems that can arise in the relationship between firms and the financiers.

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RISK TRANSFER PRODUCTS

- Insurance industry is also developing alternative risk transfer products.
- Among this kind of alternative risk transfer mechanisms that help diversify the capital and involve the financial market.
- A first kind of insurance products are catastrophe bonds, consisting in securitising some of the risk in bonds, which could be sold to high-yield investors. The so called cat bonds are able to transfer risk to investors that receive coupons that are normally a reference rate plus an appropriate risk premium.
- Weather derivatives are another kind of financial instrument used by companies to hedge against the risk of weather-related losses. Weather derivatives pay out on a specified trigger, e.g. temperature over a specified period rather than proof of loss.¹²

MITIGATION

- The insurance industry can act to tackle the consequences of climate change by playing its part in climate change mitigation, through the promotion of ways to reduce greenhouse gas emissions.

- The products that facilitate mitigation can be into 3 groups:
 1. some insurance products have the potential, either incidentally or by design, to reduce greenhouse gas emission directly;
 2. some insurance products facilitate adaptation to climate change impacts by providing incentives or capital to build resilience;
 3. other insurance products help to develop new markets for private ventures to create climate change-related solutions .

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CHARACTERIZATION OF CLIMATE CHANGE ADAPTATION AND MITIGATION BENEFITS, AND INSURANCE LINES OF BUSINESS EFFECTED

SECTOR > Strategy	MITIGATION BENEFIT	ADAPTATION BENEFIT	TYPES OF INSURANCE BENEFITS
Energy Sector - Demand Side			
Energy efficiency generally	reduced energy use	grid reliability	business interruption, cost/revenue loss, service interruption, boiler and machinery, perish
Natural ventilation; daylighting	reduced energy use	allows continued facility occupancy during power outage	business interruption
Insulated ceilings in cold climates	reduced heating energy	structural integrity and extended durability of structures during extreme disaster	property, business interruption
Concrete polystyrene wall systems	reduced heating and cooling energy use	resistant to wind and water damage	property, life/health, mold liability
Roof island mitigation, e.g. via reduced roof albedo and carbon forestry	reduced cooling energy use	extended habitability of structures during heat waves; moderation of precipitation (urban trees) and reduced flash flooding; reduced snow formation due to lower temperatures	health, life, relocation expenses; business interruption
Efficient grid-independent lighting	reduced electricity use	disaster recovery	business interruption
Efficient windows	reduced space-cooling energy	improved fire resistance and reduced vulnerability to wind-blown debris	property
Energy Sector - Supply Side			
Renewable energy systems	reduced energy use	grid reliability	business interruption, service interruption, cyber-risk, insurance (data loss), workers compensation, property loss, liability, perishable goods, interruption
Distributed energy systems	reduced electricity transmission losses (and thus energy use)	grid reliability	business interruption; more reliable power for early warning systems and road-avoid navigation
Hydroelectric systems	reduced ghg emissions	flood control	property, life/health
Business energy plantations	carbon sinks		
Agriculture, Forestry, and Land Use			
Agricultural soil management	increased soil carbon content	enhanced drought resistance	crop
Land restoration and afforestation	carbon sinks	reduced flood/mudslide risk	property, crop
Mangrove protection/restoration	carbon sinks	enhanced flood and tidal surge resistance	property, life/health
Health (Human and Other Systems)			
Improved forest management	reduced wildfires (carbon emissions)	reduced habitat for malaria vectors; flood control; reduced vulnerability to forest pests; retention of disease vectors (e.g. bats-high virus) otherwise hazardous to humans	health, life, property
Ultraslow water disinfection	reduced commercial energy use; reduced deforestation associated with water taking	ability to respond to water quality crises following extreme weather events	health, life

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ADAPTATION

- Insurers are also developing new products that facilitate adaptation to climate change, that can be divided into two types:
 1. products that help to create the conditions for active adaptation to building physically resilient communities;
 2. products that provide capital and liquidity to help communities to cope with losses caused by climate change catastrophes.
- These products will tend to reward behaviour that reduces risk of financial losses from climate change, and thus will encourage adaptive behaviour.
- These products can be defined as adaptation-oriented because they help to build the capacity of nations, communities, and businesses to cope with climate change impacts through private contracting.

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CONCLUSION

- This paper aims to show that insurance has a core role to play in environmental policy choice to tackle the climate change consequences issue.
- Governments need to utilise the benefits of the insurance industry in the fight against climate change as much as the insurance industry requires an effective government strategy in order to be supported.
- Insurance sector can contribute to develop risk management strategy to minimise climate change consequences on an urgent basis to prevent further escalation of global warming.
- The challenge is to define an efficient mix of government policy interventions to provide the right incentives to invest in cost-effective preventive measures to reduce the final cost of disasters.

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