

Dr Peter Gist

Arup

Technology Strategy Board

Driving Innovation

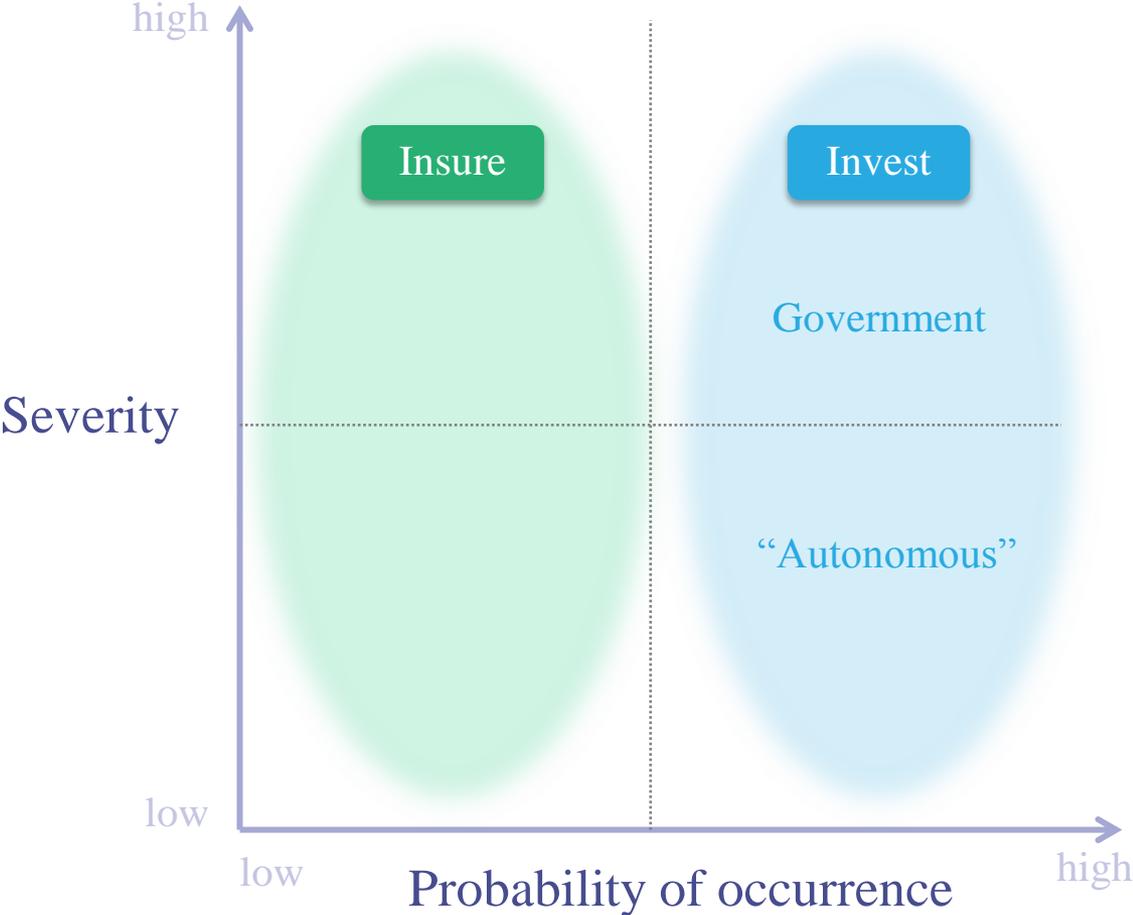


Building a resilient future: an economic perspective

Dr Peter Gist Arup Fellow | Director

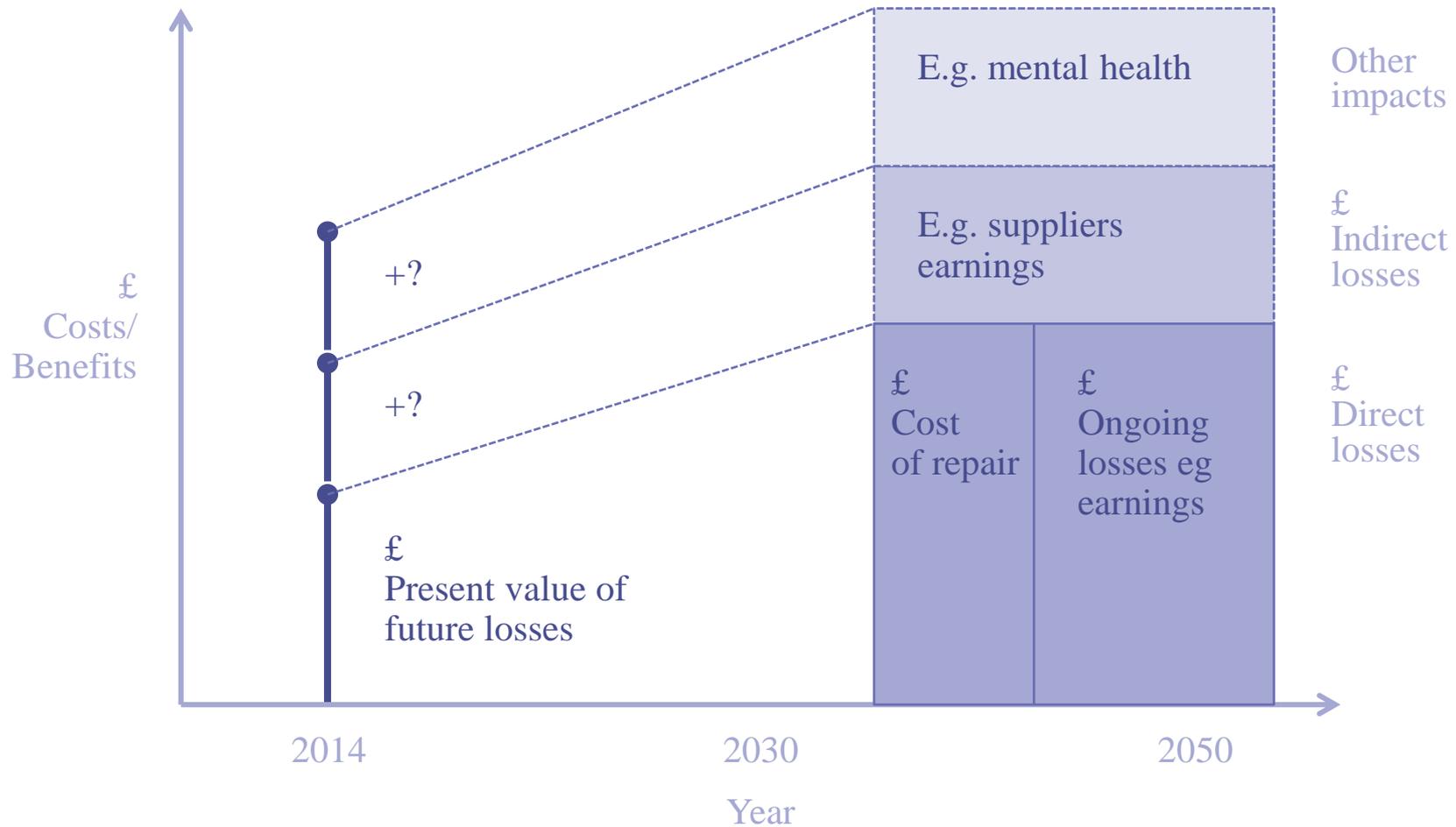


Expenditure on resilience



Invest if valuation of benefits exceeds costs

$B > C$ if PV of future losses > cost of investment in resilience



Factors impeding investment in resilience

High discount rate

Future losses a long time in the future

Uncertainty and imperfect information

- Climate change effects (sea levels, temperature, precipitation)
- Frequency, severity of weather events (and regional, local effects)
- Impacts on environment, people
- Effectiveness of resilience measures

Missing markets (“externalities”)

- Impacts not measurable in financial terms

Misaligned markets

- Investors won't capture benefits, governance issues
- “Public goods” (often related to large public infrastructure)

Budget constraints

So what do we do?

High discount rate, future losses a long way off	<ul style="list-style-type: none">- Reduce rate of long term impacts e.g. intergenerational impacts (a la Stern) – Government projects only?
Uncertainty and imperfect information	<ul style="list-style-type: none">- Improve forecasting, modeling (climate, extreme events)- Understand impacts better (local, national, interdependence between assets)- Understand resilience measures better e.g. trade off actions, “no regret options” (those with positive benefits)
Missing markets (“externalities”)	<ul style="list-style-type: none">- Improve C-B approach and understanding of indirect/wider impacts- Continue to develop £ measures for them
Misaligned markets	<ul style="list-style-type: none">- Establish appropriate responsibilities/governance arrangements
Budget constraints	<ul style="list-style-type: none">- Use of financial instruments to increase budgets e.g. catastrophe bonds- Review C-B criteria for resilience investment from given budgets- Address affordability issues e.g. employ smaller iterative investments when possible using latest information- Invest in resilience when replacing/upgrading assets