

Assessing the Costs and Benefits of Green Growth: Update on U.S. and Mexican Approaches

Winston Harrington, Richard D. Morgenstern, and
Daniel Velez-Lopez

Green Growth Knowledge Platform Conference

Mexico City

January 13, 2012



Background

- Gold standard of green growth is when economic growth and environmental gain are complements not substitutes
- Beyond that, we look for projects where public and private benefits exceed total costs, including environmental and other social costs
- Costs generally easier to calculate than benefits, but market prices may be poor measures of opportunity costs in face of high unemployment
- Current analyses assume limited or no employment impacts of regulation

Background, cont'd

- *Ex post* analyses increasingly used, often involving experimental and randomized designs, e.g., anti-poverty programs, anti-malaria campaigns
- However, randomized experiments difficult in field of environmental protection, especially in the case of regulation, as exclusions are rarely random
- Thus, most *ex post* studies involve simple estimates of direct costs and benefits, based on surveys, observed price changes, etc

U.S. Case

- Environmental laws vary in use of BCA
- Formal RIA requirements in place for 30+ years via E.O.s 12291, 12866, 13535
- Apply to rules with costs and/or benefits in excess of \$100 million per annum
- Use present value framework for both market and nonmarket goods/services, based on monetary measures of welfare change
- CEA used in absence of nonmarket values

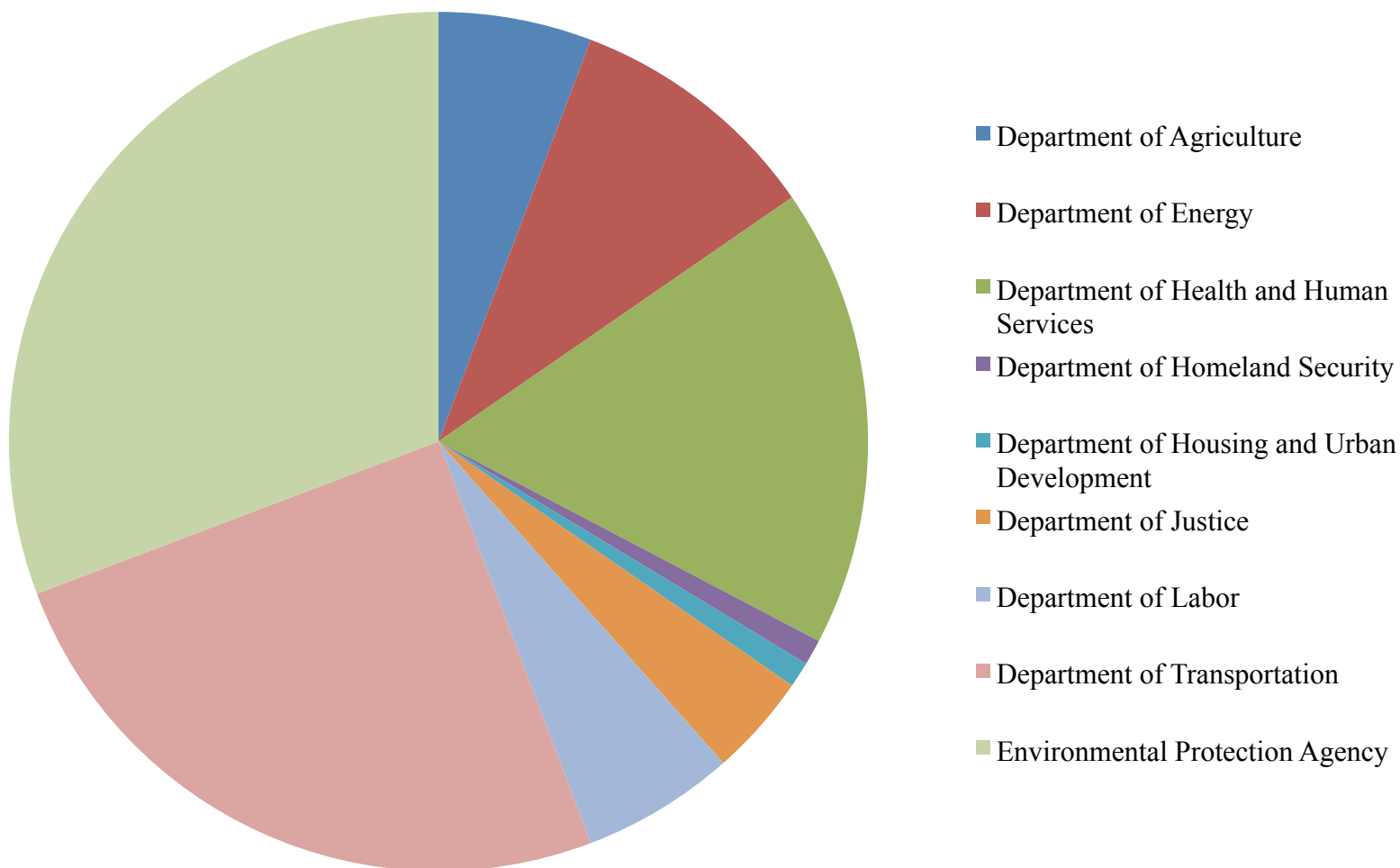
U.S. Case, cont'd

- Guidelines on the proper procedures for RIAs have been issued by OMB and by individual regulatory agencies
- RIAs prepared by EPA and other regulatory agencies
- OMB reviews RIAs (and regulations) prior to issuance

Key elements of a high quality BCA

- Identification of a market failure
- Establishment of a credible baseline
- Description of alternatives considered
- Analysis of possible unanticipated outcomes
- Scope and nature of costs/benefits addressed
- Appropriate use of discounting
- Treatment of uncertainty

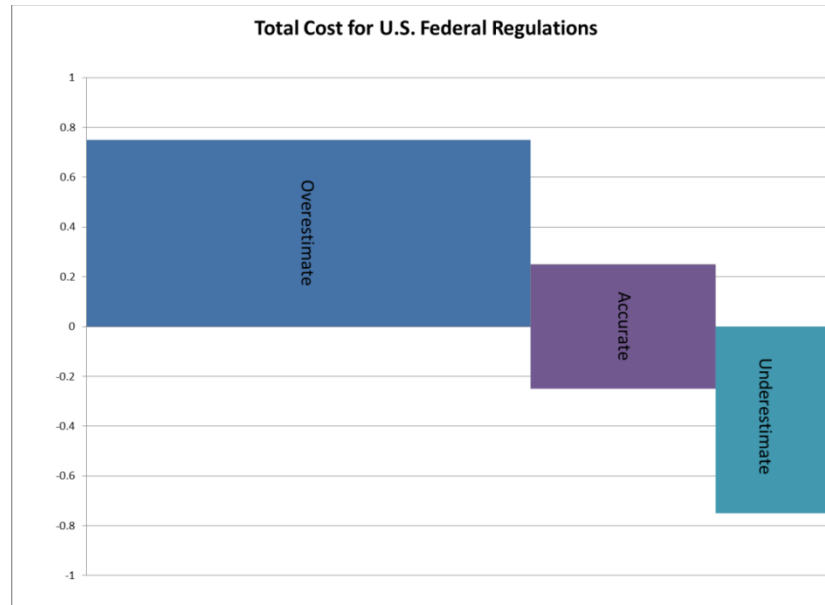
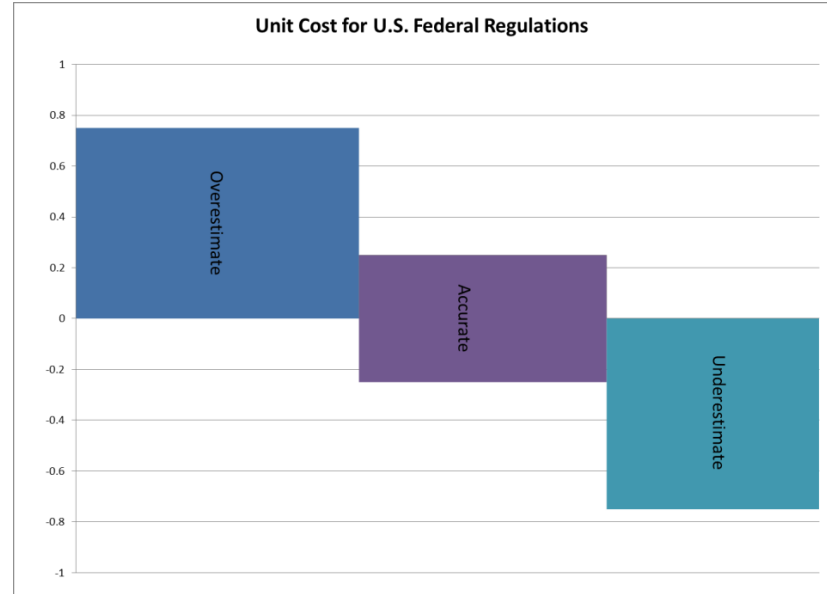
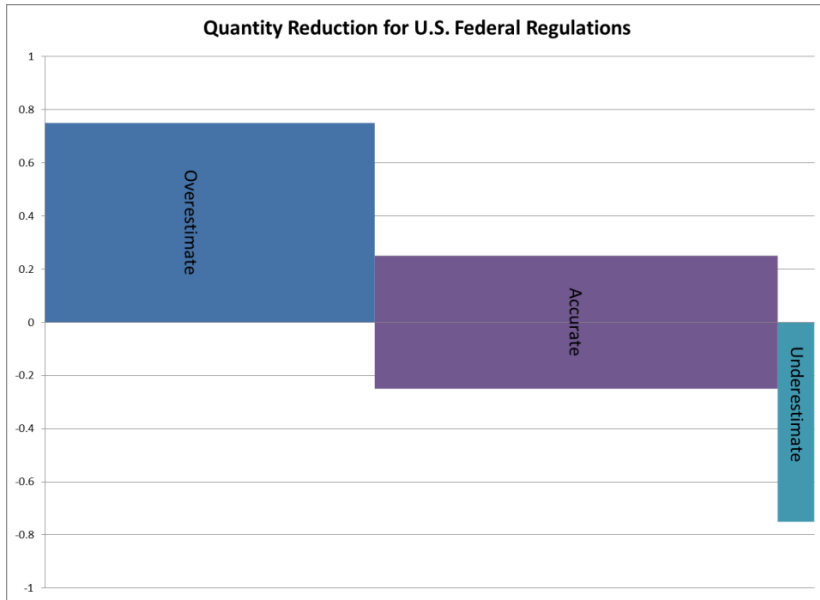
Major Rules and Regulations Submitted to OMB



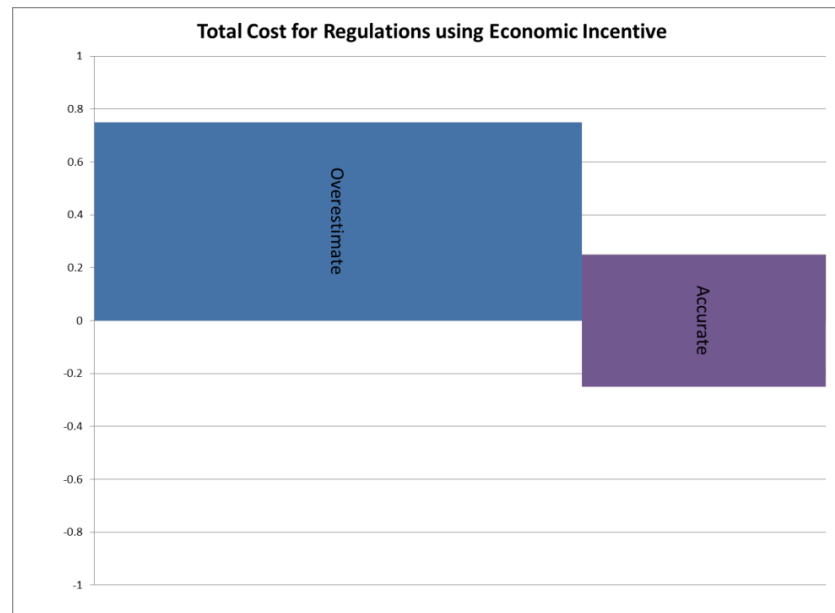
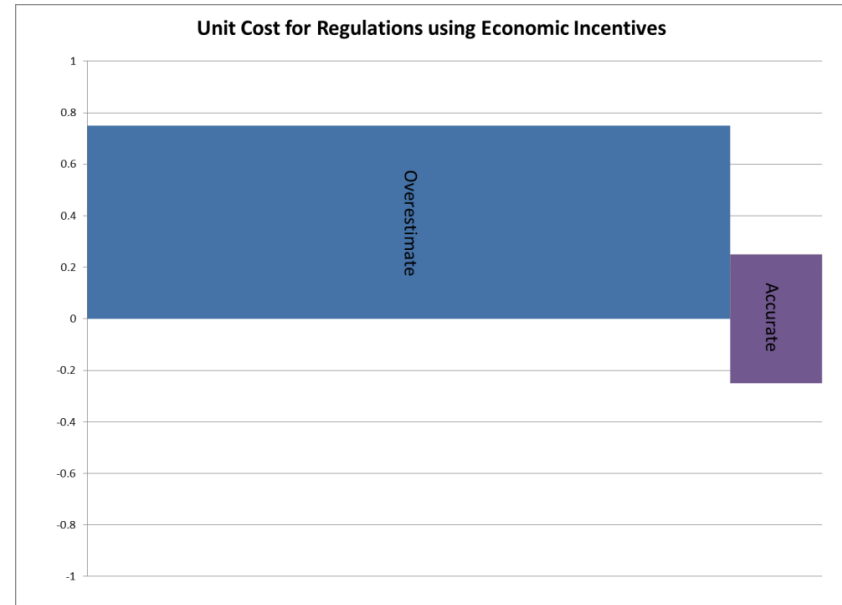
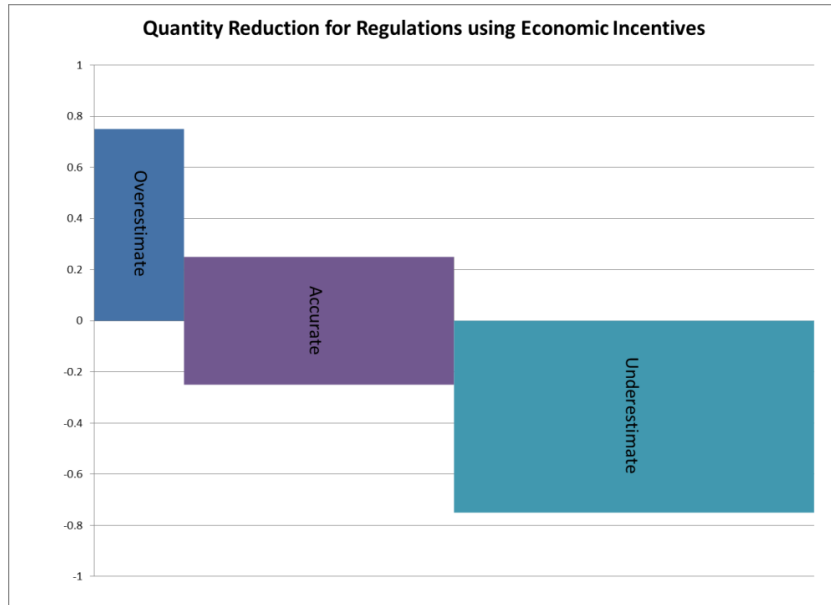
Ex ante vs Ex post comparisons of regulatory costs

- Initial work by Harrington, Morgenstern, Nelson (2000) (HMN) focused on environmental and workplace safety (25 rules)
- *Ex ante* estimates based strictly on government calculations
- *Ex post* estimates mostly drawn from quite limited academic literature
- HMN defined 'accurate' as +/- 25%

Ex Ante vs. Ex Post : All Federal Regulations



Ex Ante vs. Ex Post : Economic Incentive Regulations



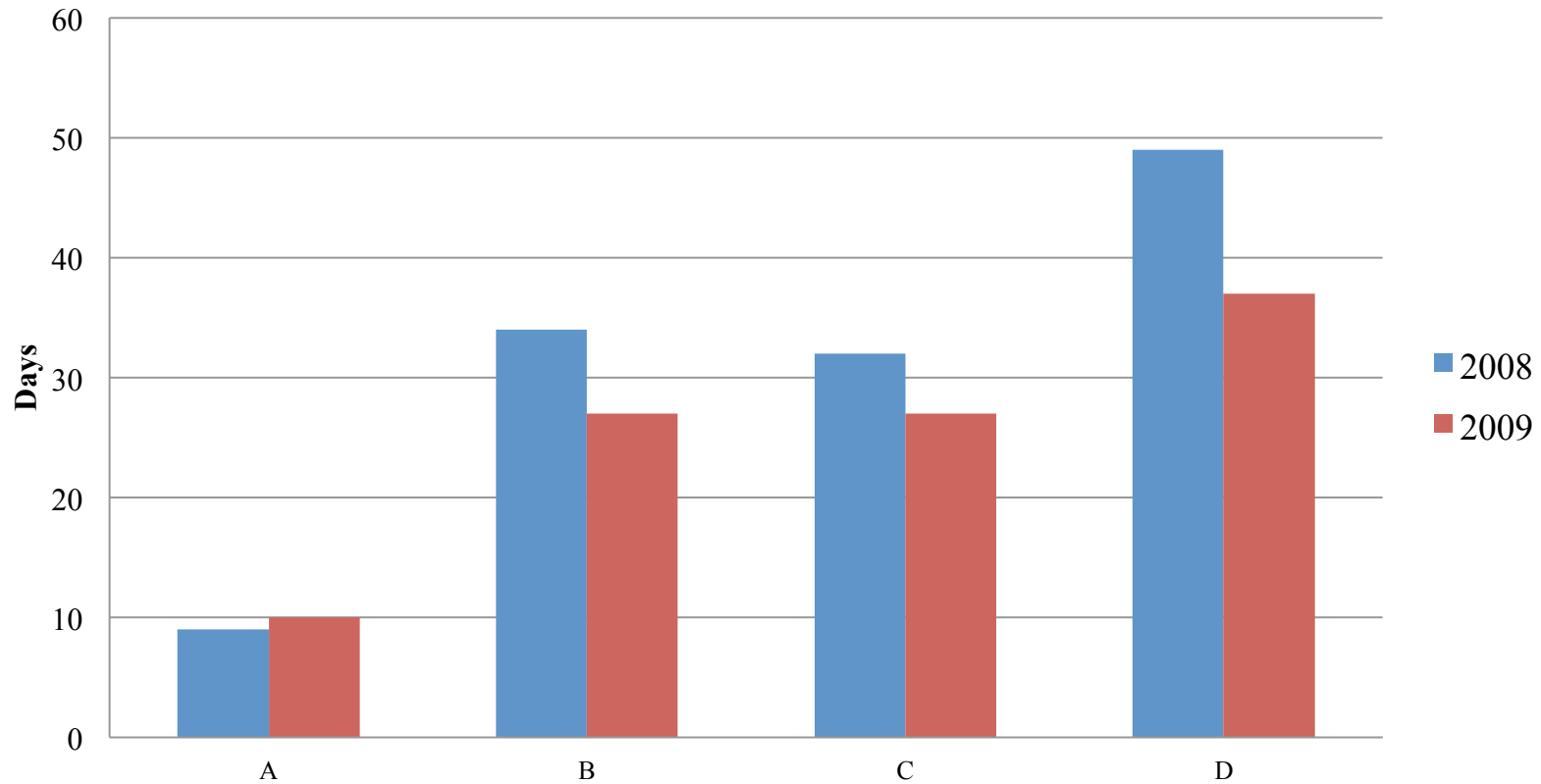
Ex ante vs Ex post, cont'd

- OMB extended analysis to include NHTSA, NRC, and DOE appliance standards; Harrington later added various omitted regs
- Focus on BC ratios, not simply costs
- Total of 74 rules
- Harrington finds that BC ratio is more often underestimated than overestimated

Mexican case

- Mexico scores above median in Worldwide Governance Indicators for Regulatory Quality, and shows improvement over last 3 years
- Scores above other large Latin American countries, except Chile
- COFEMER created in 2000 to promote regulatory reform across all agencies, including SEMARNAT
- Similar to U.S. OMB, COFEMER reviews new regulations and oversees process

Duration of regulatory improvement process



Route A: Total approval with final effects

Route B: Preliminary approval + Final approval

Route C: Adjustments and corrections + Total approval with final effects

Route D: Adjustments and corrections + Preliminary approval + Final approval

RIA requirements

- Until recently, RIA only required for rules with annual costs in excess of MEX\$800 million, roughly comparable to the US (US\$60 million at current exchange rates; US\$100 million at PPP)
- But since US economy is 10x the size of Mexico, Mexican cutoff implies relatively fewer RIAs
- 2010 new scoring system introduced with quantitative and qualitative elements; including number of impacted entities and expected compliance issues

RIA Requirements, cont'd

- Fewer detailed requirements than U.S., but does include:
 - Explanation of why government regulation needed
 - Justification for regulation, including analysis of potential effects (costs and benefits)

Review of Three Recent Mexican BCAs

Regulation	Quantified Costs	Unquantified Costs	Monetized Benefits	Unquantified Benefits	Alternatives Considered?
NOM-085 for emissions from indirect heating equipment used in power generation	Yes	No	Yes	No	No
NOM-044 for emissions from diesel engines used in large vehicles	Yes	Yes	Yes	Yes	Yes
Rules for regulating highly risky activities	Yes	No	Yes	Yes	Yes

Ex Post Analysis

- Recently completed by SEMARNAT, covering 16 rules 1996-2006
- Not focused on costs or benefits, no comparison with *ex ante* estimates
- Qualitative grading system for four elements:
 - Success at achieving environmental goals (effect)
 - Success at altering practices of entities (effectiveness)
 - Viability of enforcement mechanism (efficacy)
 - Qualitative assessment of benefits vs costs (efficiency)

Ex Post Evaluations of Mexico's Environmental Regulation

Regulation	Effect or Impact	Effectiveness	Efficacy	Efficiency	Average Rating
NOM-062-SEMARNAT-1994	0	0	0	0	0.00
NOM-001-SEMARNAT-1996	0	1	2	0	0.75
NOM-027-SEMARNAT-1996	1	1	2	2	1.50
NOM-003-SEMARNAT-1997	2	2	1	4	2.25
NOM-120-SEMARNAT-1997	0	0	0	0	0.00
NOM-047-SEMARNAT-1999	2	2	3	3	2.50
NOM-133-SEMARNAT-2000	1	1	2	1	1.25
NOM-040-SEMARNAT-2002	3	3	3	4	3.25
NOM-098-SEMARNAT-2002	2	4	3	4	3.25
NOM-055-SEMARNAT-2003	0	0	3	0	0.75
NOM-083-SEMARNAT-2003	1	1	3	1	1.50
NOM-115-SEMARNAT-2003	3	3	4	4	3.50
NOM-137-SEMARNAT-2003	4	2	4	3	3.25
NOM-141-SEMARNAT-2003	2	3	2	3	2.50
NOM-041-SEMARNAT-2006	2	2	3	3	2.50
NOM-045-SEMARNAT-2006	1	1	0	1	0.75

Conclusions (1)

- Quantitative economic assessment in support of green growth is progressing in both the U.S. and Mexico. Among developing countries, Mexico is quite advanced. Some important similarities:
 - Both nations embrace BCA framework
 - Both nations have developed specific technical requirements as well as institutions to implement program
 - Both nations have similar \$ cutoffs for RIAs, albeit with different implications

Conclusions (2)

- Preliminary results of *ex post* evaluation in U.S. suggest that while total costs may be overestimated, unit cost estimates are generally accurate. Economic incentive regulations consistently overestimate both total and unit costs.
- Despite progress, many gaps in analyses in both nations involving quantification and monetization of costs and benefits. Notwithstanding its leadership among developing nations, Mexico has many opportunities to increase rigor of both current and *ex post* analyses.

Conclusions (3)

- More research needed on employment impacts of green growth regulation. Current assumption of limited or no impacts is not tenable, especially in era of slow economic growth.
- Research issues:
 - The number of jobs lost or gained by green growth regulation
 - The economic impacts of the job losses or job gains
 - Characterization of situations resulting in job loss/gain
 - Types of industries
 - Forms of regulation
 - Timing of regulation vis-à-vis business cycle