

Policy Uncertainty and the Transition to Clean
Technologies
Second Partner's Meeting

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25 November 2019

What do I do?

- I analyze the **investment choice of a scientist under policy uncertainty** in a model of directed technical change¹.
- Here, productivity growth pertains to specific technologies so I can compare the relative performance of clean and dirty technologies.
- A representative final good is produced using both clean and dirty inputs.
- The productivity of clean vs. dirty technologies depicts how intensively they are used in production (\implies more productive technologies are cheaper).

¹Acemoglu, D., Aghion, P., Bursztyn, L., and Hemous, D. (2012). The Environment and Directed Technical Change. *The American Economic Review*, 102(1):131–166.

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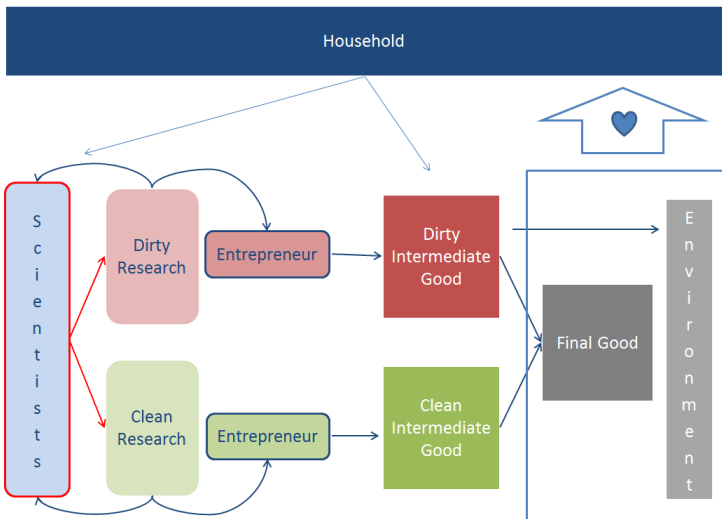
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- *But what drives the relative productivity of clean vs. dirty technologies?* **Scientists.**
- Scientists choose whether to improve productivity in the clean or dirty sector based on the prospective profits they earn upon successful innovation.

To be more precise: this is the model setup



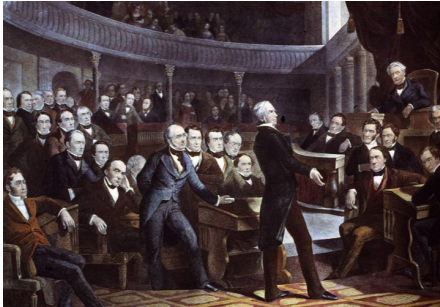
Why is policy uncertainty important here?

- By assumption, dirty technologies are more productive initially so in absence of policy intervention they will be used excessively in production and the economy converges into an environmental disaster.
- This is because of the *environmental externality*, i.e. the fact that the polluting side effect of using the dirty technology is not reflected in its market price, implying that it will be used excessively.
- The only way for the economy to experience sustained long-run growth is through the use of policies - a carbon tax.

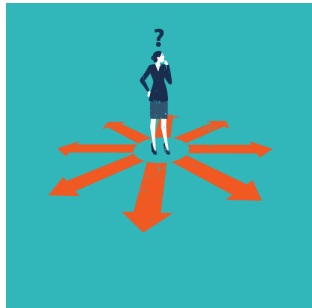
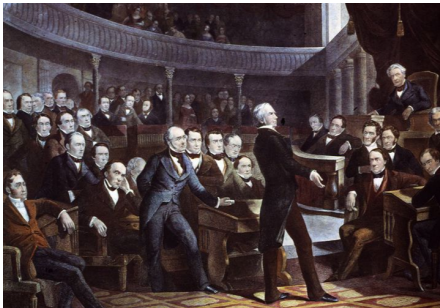
Anticipated effects of policy uncertainty

- By introducing uncertainty around the carbon tax, I make the option of investing into clean technologies more risky so less attractive.
- Thus, fewer scientists will switch to improving clean technologies and the polluting dirty ones will be used longer.
- This might lead to
 - ▶ an environmental disaster, or
 - ▶ sustained long-run growth but under higher cost of the transition to clean technologies because of the widened technology gap between clean and dirty technologies.

Again: policy uncertainty distorts the choice of the scientist...



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...making her more reluctant to invest into the clean sector as opposed to investing into more established dirty technologies.



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As a result, sustainable long-run growth is at risk and the economy might go into a state of environmental disaster.



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The end

Thanks for your attention.