

Harmonization...What Else? The Role for International Regulatory Agreements

Giovanni Maggi
Yale University,
FGV EPGE, and NBER

Monika Mrázová
University of Geneva,
CEPR, and CESifo

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DEEP INTEGRATION

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- ▶ ...and more controversial...
- ▶ Much of the debate is about *harmonization of standards*

HARMONIZATION CONTROVERSY



*“This is why **harmonisation** risks lowering our standards to the lowest common denominator. Again, **harmonisation** was a demand of big business that European trade negotiators included with little changes into the regulatory cooperation chapters of CETA and TTIP.”*

Corporate Europe Observatory (2017)

HARMONIZATION CONTROVERSY



Environment Climate crisis Wildlife Energy Pollution

The Observer GM

Is chlorinated chicken about to hit our shelves after new US trade deal?

Le Monde

PLANÈTE · ACCORD COMMERCIAL EUROPE-CANADA - CETA

CETA : comment le Canada tente de saper les normes européennes sur les pesticides et les OGM



KEY TRADEOFF

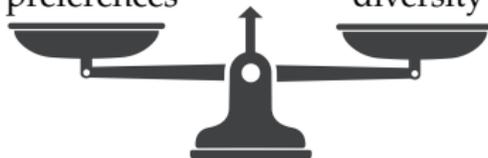
- ▶ Key tradeoff from standpoint of efficiency:

Diversity

Harmony

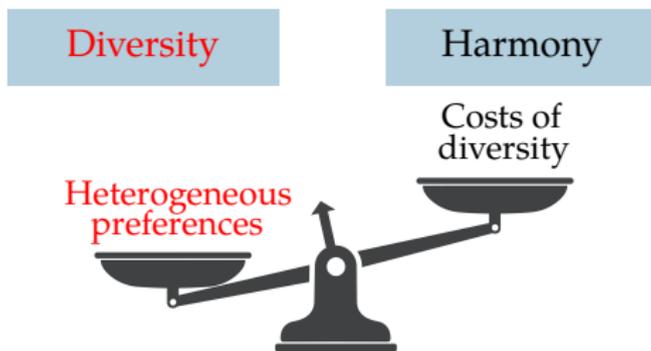
Heterogeneous
preferences

Costs of
diversity



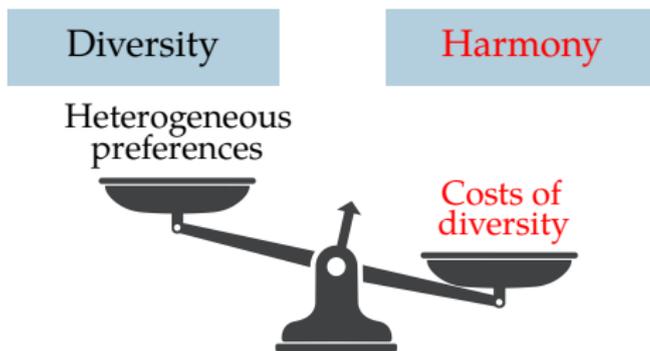
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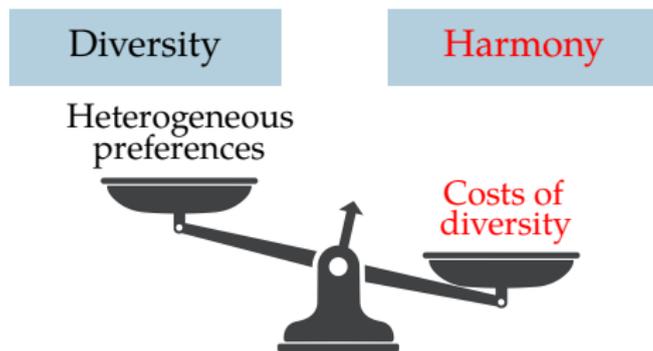
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- ▶ Costs of regulatory diversity: mostly *fixed costs*

▶ Details

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 - ▶ Does lobbying lead to pernicious harmonization? Can a harmonization agreement decrease welfare relative to the non-cooperative scenario?

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- ▶ With intra-industry trade, agreements are more likely to play a *coordination* role
 - ▶ ...and might help govs coordinate on diversity regime
- ▶ Under lobbying harmonization is more likely to occur
 - ▶ ...and it may decrease welfare
 - ▶ ...but the problem may not lie in the agreement *per se*

RELATED LITERATURE

- ▶ “Old” vs “new” trade agreements: Grossman, McCalman and Staiger (2021)
 - ▶ Semi-fixed costs (product specification costs)
 - ▶ Free entry, no political economy
- ▶ Protectionist role of standards in a noncooperative scenario: Fischer and Serra (2000), Suwa-Eisenmann and Verdier (2002)
- ▶ Regulatory cooperation without fixed costs of regulatory diversity: Costinot (2008), Maggi and Ossa (2021), Parenti and Vannoorenberghe (2022)
- ▶ Quantification of welfare effects of “National Treatment” rule for standards: Mei (2021)
- ▶ Network effects: e.g. Farrell and Klemperer (2007)

OVERVIEW

Basic model

One-way trade

Intra-industry trade

Extensions

Conclusion

THE ECONOMIC STRUCTURE

- ▶ Two countries, Home and Foreign (*)
 - ▶ symmetric in size and consumer preferences

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 - ▶ Information costs, specification costs

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TWO SCENARIOS

- ▶ A single firm at Home → *one-way trade*
- ▶ Cournot duopoly with symmetric firms → *intra-industry trade* à la Brander-Krugman

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Non-cooperative equilibrium

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Political Economy

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HOME WELFARE

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- ▶ n is the number of supplied varieties
 - ▶ If $e = e^*$ then $n = 1$
 - ▶ If $e \neq e^*$ then $n = 2$

HOME'S PREFERRED STANDARD

$$\tilde{W}(e, e^*) = \underbrace{CS(e) - \alpha E(e) + \pi(e) + \pi(e^*)}_{W(e, e^*)} - n(e, e^*)F$$

- ▶ W : Home welfare gross of fixed costs
 - ▶ Assume W is single-peaked in e
 - ▶ Home's "preferred" standard is $e_W = \arg \max_e W$

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- ▶ Total surplus (gross of fixed costs) arising in Home:
 - ▶ $S(e) = CS(e) - \alpha E(e) + \pi(e)$
 - ▶ Surplus maximizing standard: $e_S = \arg \max_e S$
 - ▶ Note: $e_W = e_S$ in this setting

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- ▶ Total surplus (gross of fixed costs) arising in Foreign:
 - ▶ $S^*(e^*) = CS(e^*) - \alpha^*E(e^*) + \pi(e^*)$
 - ▶ Surplus maximizing standard: $e_S^* = \arg \max_e S^*$
 - ▶ Foreign does not care about Home firm's profits, so $e_W^* < e_S^*$

PRODUCT-STANDARD-SETTING GAME

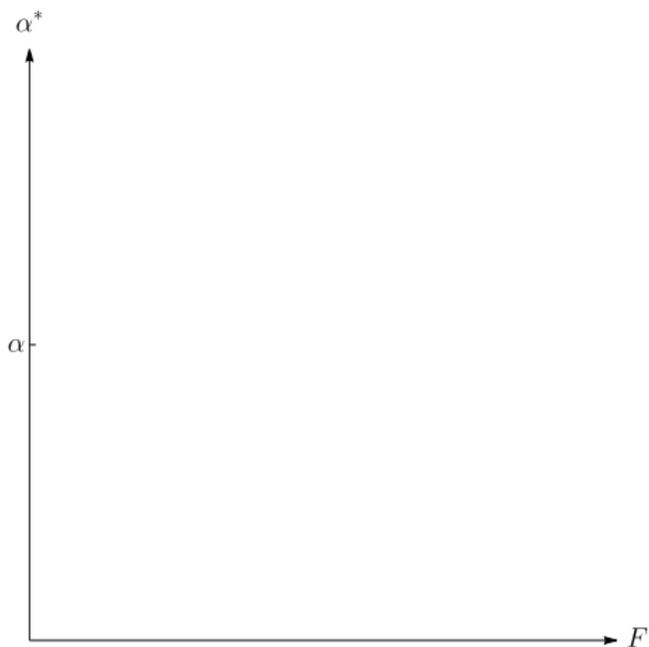
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- ▶ How does the equilibrium outcome depend on three parameters of interest: α , α^* and F ?
 - ▶ α, α^* : “fundamental” preference parameters
 - ▶ F : cost of regulatory diversity

PARAMETER SPACE OF INTEREST



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 - ▶ Positive "matching externality": given e , if Foreign chooses a matching e^* it reduces the Home firm's fixed cost
- ▶ Home's choice of standard does not affect Foreign in this setting
- ▶ The matching externality might suggest that an agreement should encourage harmonization. But this intuition is not quite correct...

HOME GOVERNMENT REACTION FUNCTION

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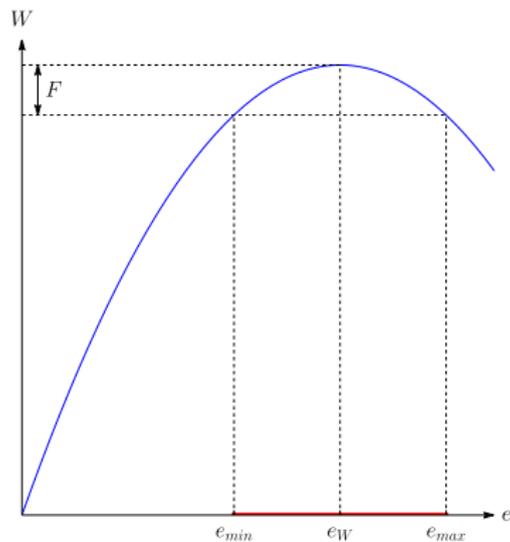
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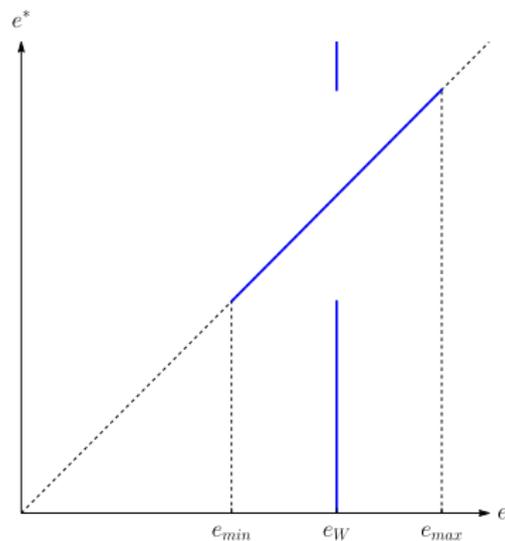
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$$e_W = \arg \max_e W(e, e^*)$$

Tolerance region



Reaction function



FOREIGN REACTION FUNCTION

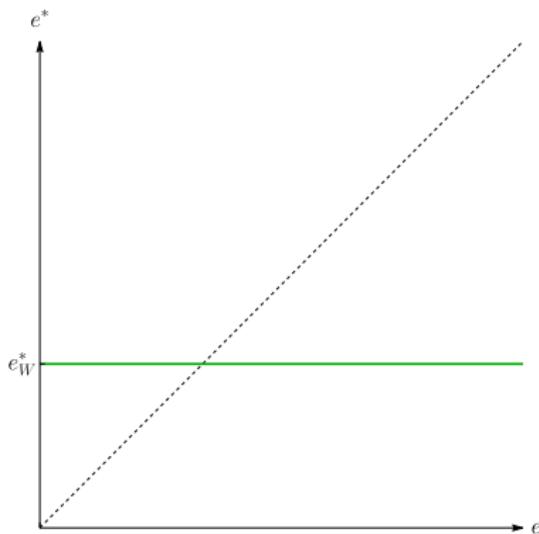
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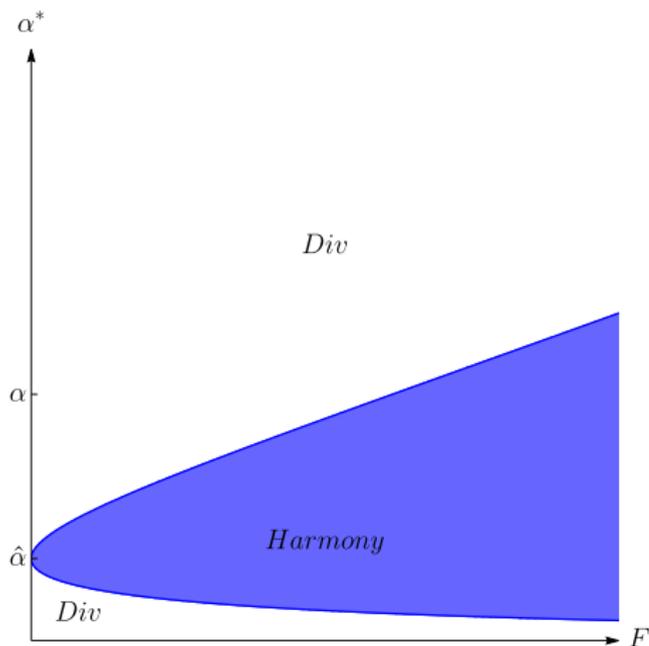
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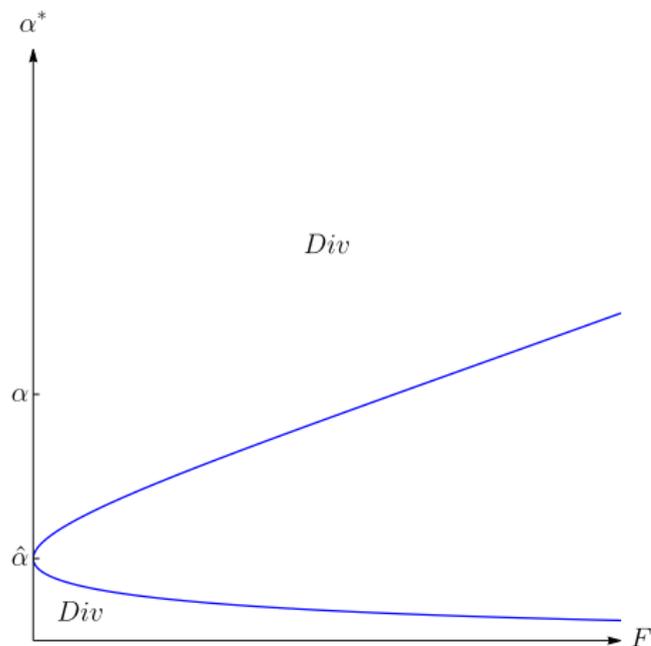


NASH EQUILIBRIUM

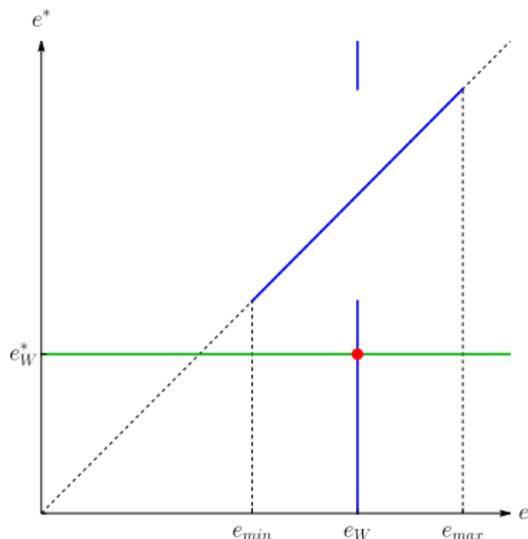


$\hat{\alpha}$: value of α^* such that *regulatory* preferences are the same: $e_W = e_W^*$

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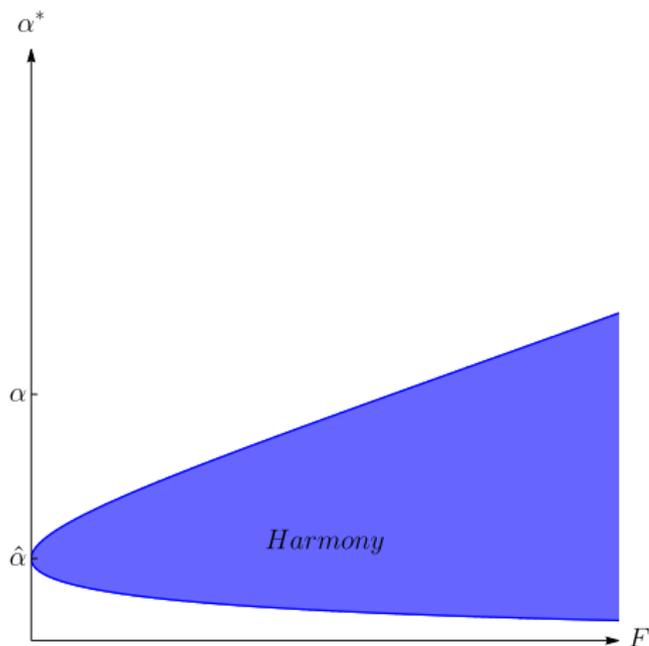


► $\frac{|\alpha^* - \hat{\alpha}|}{F}$ large \Rightarrow *Div*

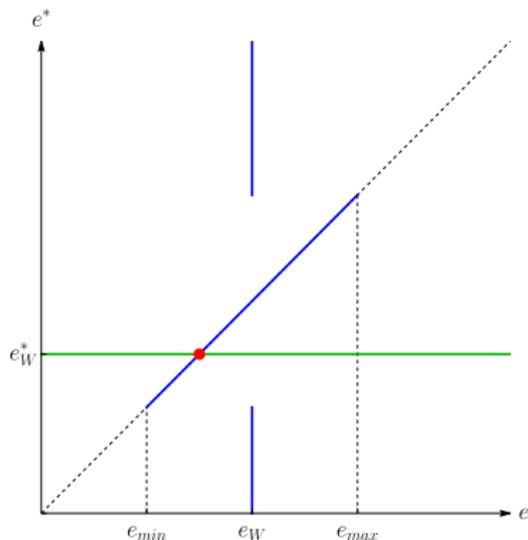


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▶ $\frac{|\alpha^* - \hat{\alpha}|}{F}$ small \Rightarrow *Harmony*



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CALIFORNIA/BRUSSELS EFFECT

- ▶ Do we observe spontaneous harmony in reality?
- ▶ Several studies have found evidence of the so-called “California” or “Brussels” effect: a tendency of product standards to ratchet upwards towards levels found in high-regulating states
 - ▶ See for ex. Vogel (1995), Bradford (2019)

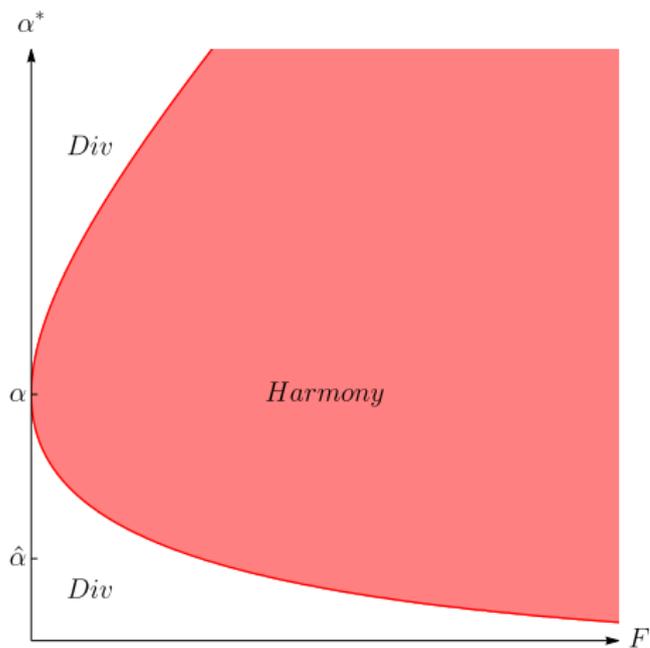
COOPERATIVE STANDARDS

- ▶ Home and Foreign choose e and e^* to maximize joint welfare

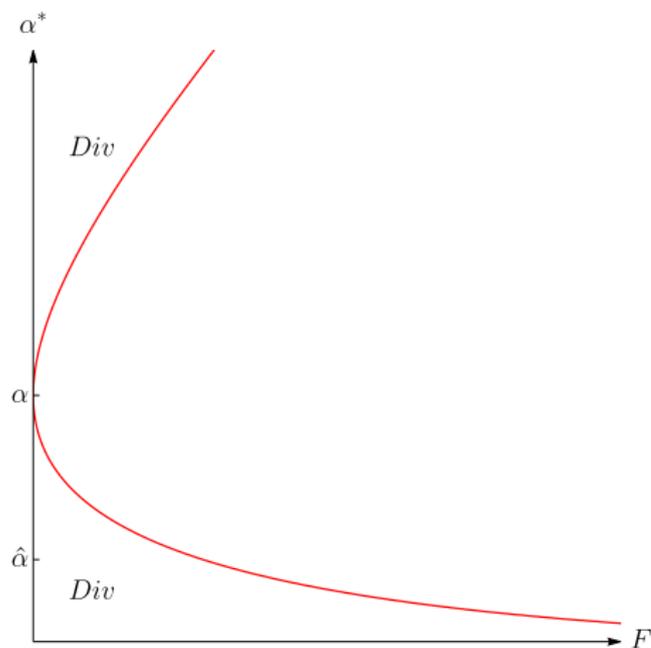
$$\max_{e, e^*} [\tilde{W}(e, e^*) + \tilde{W}^*(e^*)] = \max_{e, e^*} [S(e) + S^*(e^*) - n(e, e^*)F]$$

- ▶ Implicitly assumes international transfers available

COOPERATIVE REGULATORY REGIME

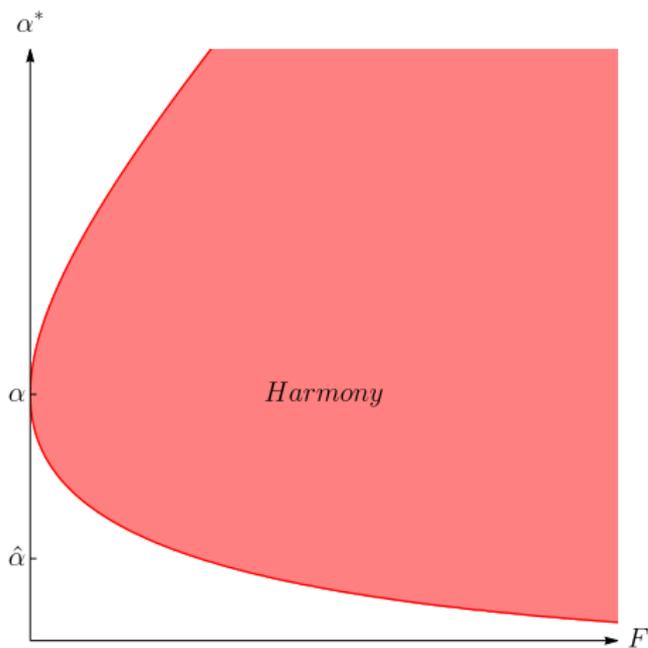


COOPERATIVE REGULATORY REGIME



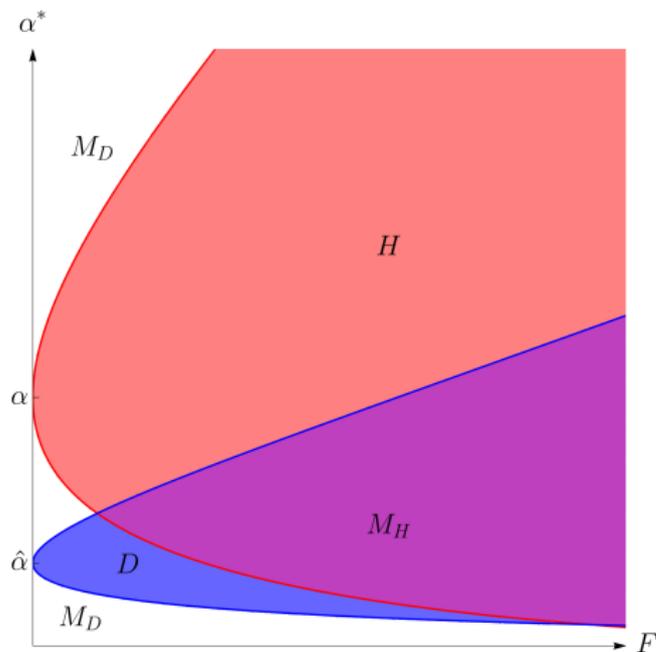
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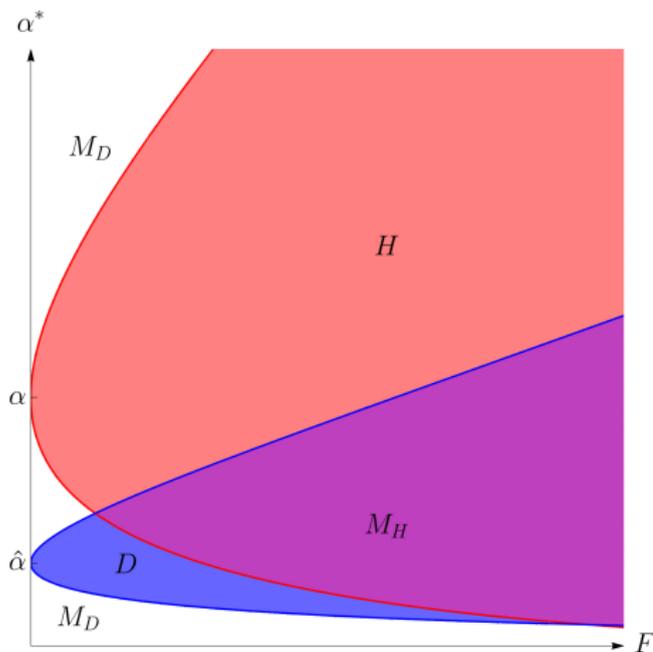
HOW COOPERATION AFFECTS THE REGULATORY REGIME



► Harmonization (H) if

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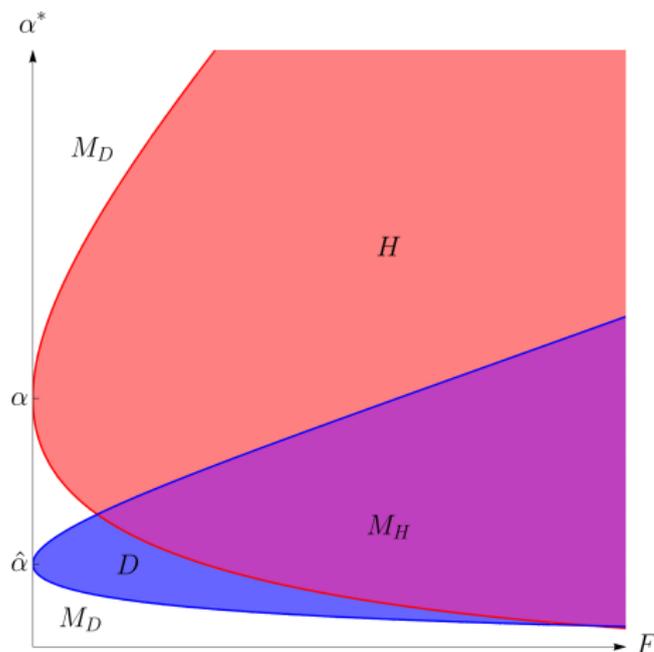
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$$\begin{cases} \frac{|\alpha^* - \alpha|}{F} & \text{sufficiently large} \\ \frac{|\alpha^* - \hat{\alpha}|}{F} & \text{sufficiently small} \end{cases}$$
- ▶ Otherwise cooperation maintains regime (M_D , M_H) and only changes standards *levels*

HOW COOPERATION AFFECTS THE REGULATORY REGIME

- ▶ Why would an agreement *diversify* standards?

HOW COOPERATION AFFECTS THE REGULATORY REGIME

- ▶ Why would an agreement *diversify* standards?
 - ▶ Spontaneous harmony occurs when countries have similar *regulatory* preferences

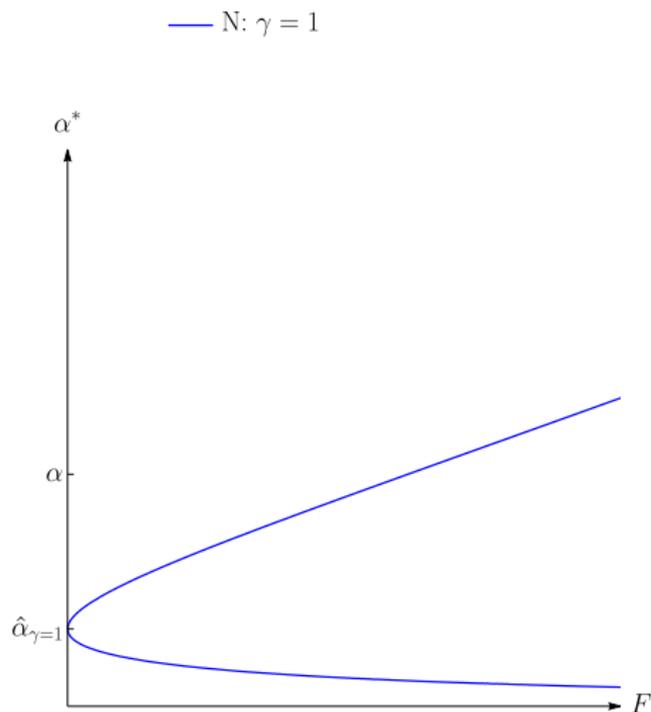
HOW COOPERATION AFFECTS THE REGULATORY REGIME

- ▶ Why would an agreement *diversify* standards?
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 - ▶ ...but this implies that *fundamental* preferences are dissimilar (Home cares about π and Foreign does not)

HOW COOPERATION AFFECTS THE REGULATORY REGIME

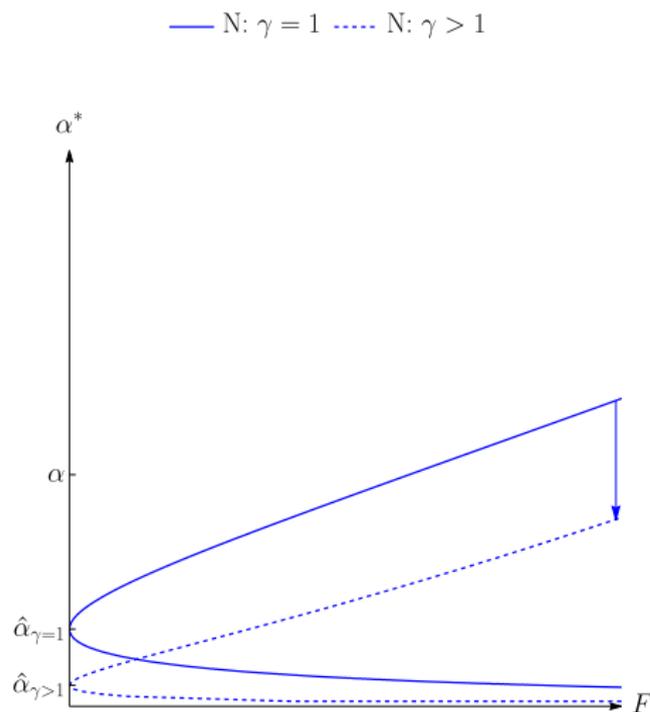
- ▶ Why would an agreement *diversify* standards?
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 - ▶ ...but this implies that *fundamental* preferences are dissimilar (Home cares about π and Foreign does not)
⇒ harmony inefficient

POLITICAL ECONOMY: NON-COOPERATIVE EQUILIBRIUM



- ▶ Home gov's objective under lobbying:
 $\tilde{W} + (\gamma - 1)(\pi + \pi^* - nF)$
- ▶ Foreign gov's objective as before

POLITICAL ECONOMY: NON-COOPERATIVE EQUILIBRIUM



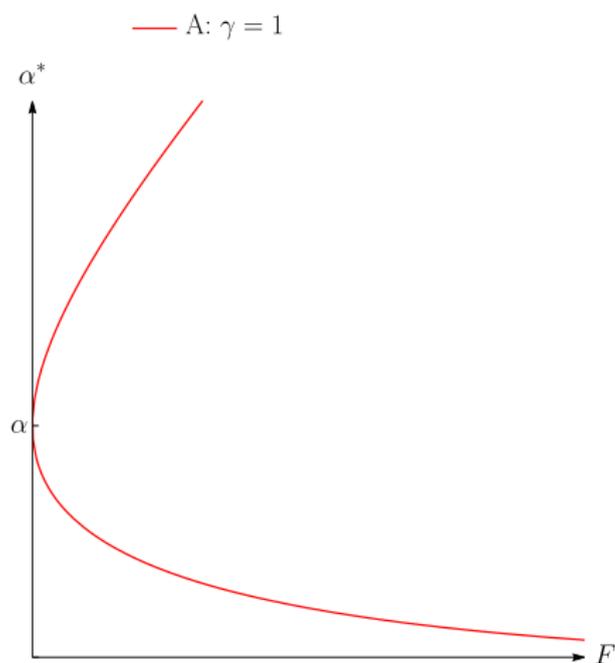
- ▶ Home gov's objective under lobbying:
 $\tilde{W} + (\gamma - 1)(\pi + \pi^* - nF)$
- ▶ Foreign gov's objective as before
- ▶ Lobbying shifts down the spontaneous harmony region
 - ▶ Intuition: Home preferred standard gets looser, so $\hat{\alpha} \downarrow$

▶ Proof

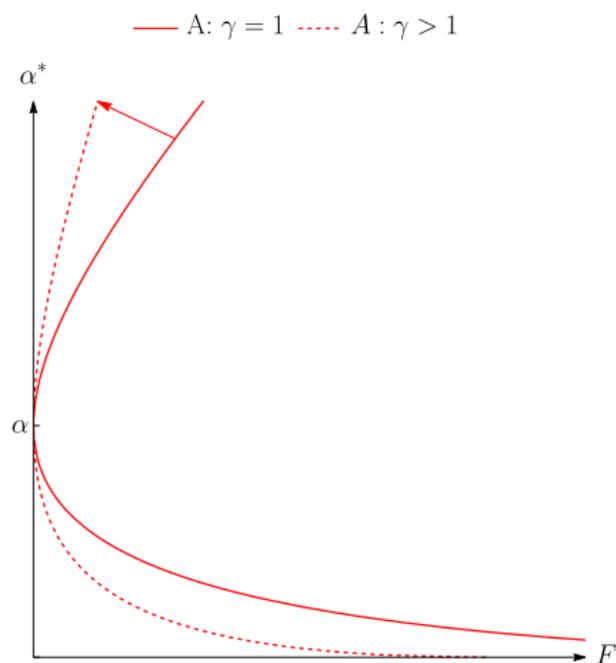
POLITICAL ECONOMY: COOPERATIVE EQUILIBRIUM

- ▶ The agreement maximizes

$$\tilde{W}^w + (\gamma - 1)(\pi + \pi^* - nF)$$



POLITICAL ECONOMY: COOPERATIVE EQUILIBRIUM



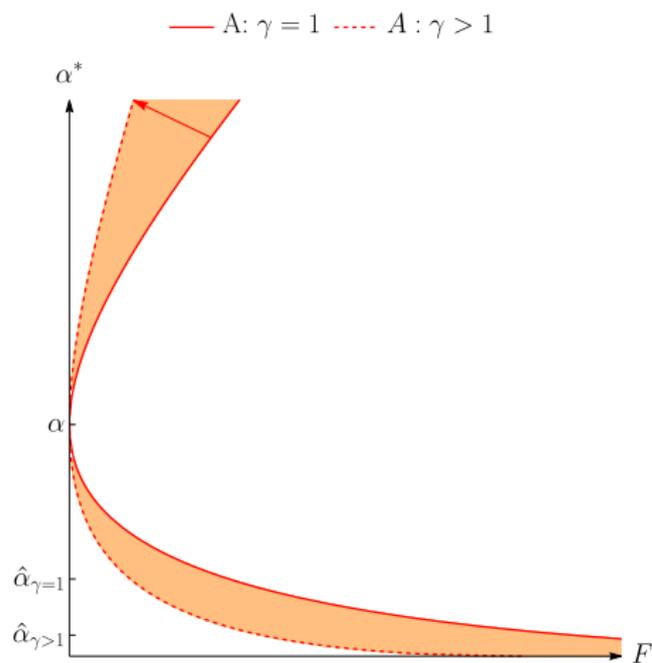
- ▶ The agreement maximizes

$$\tilde{W}^w + (\gamma - 1)(\pi + \pi^* - nF)$$

- ▶ Lobbying increases likelihood of cooperative harmony (under regularity conditions)
 - ▶ Intuition: firm cares about F , not about the environment

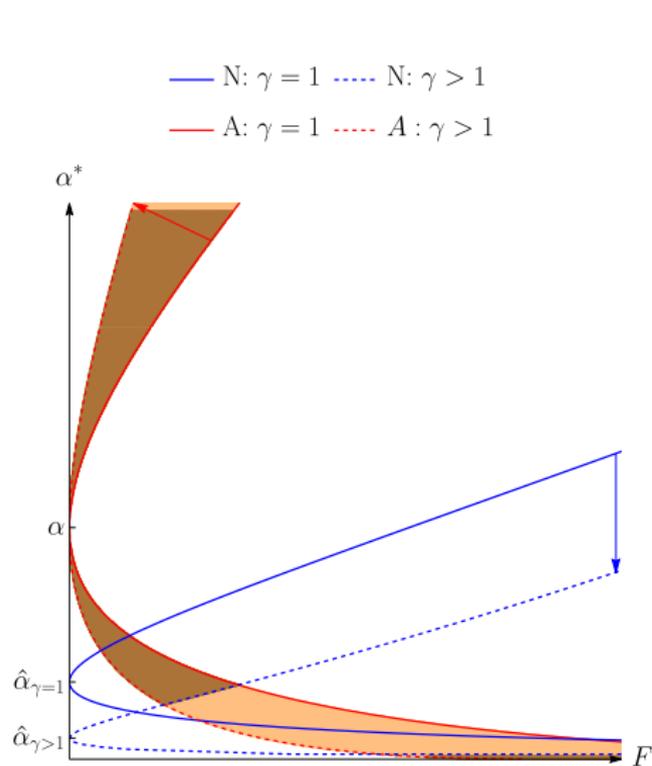
▶ Proof

THE POP CRITIQUE



- ▶ Intermediate $\frac{|\alpha - \alpha^*|}{F}$: the politically-pressured agreement does Harmony, while efficiency requires Diversity

THE POP CRITIQUE

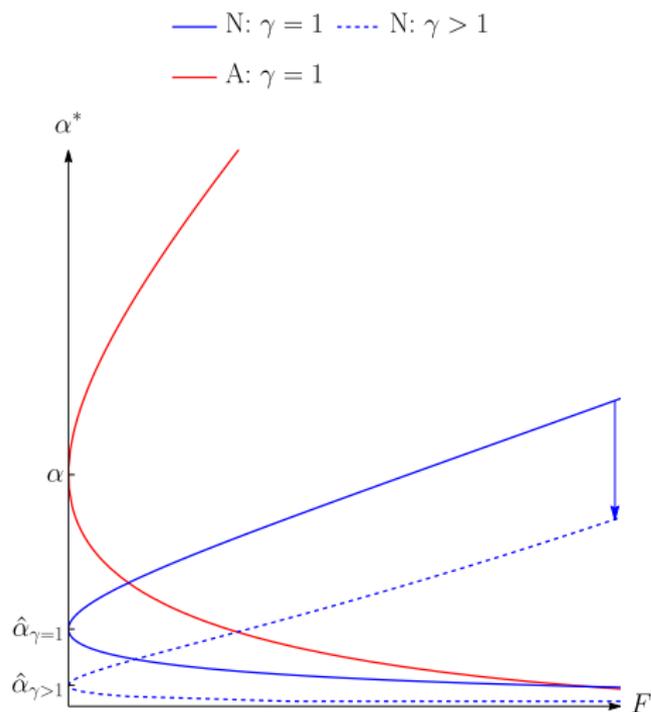


- ▶ Intermediate $\frac{|\alpha - \alpha^*|}{F}$: the politically-pressured agreement does Harmony, while efficiency requires Diversity
- ▶ In Brown, the agreement harmonizes standards when it shouldn't
- ▶ In Orange, the agreement maintains harmony when it shouldn't
- ▶ The agreement can never inefficiently diversify
- ▶ Pop Critique may be right?

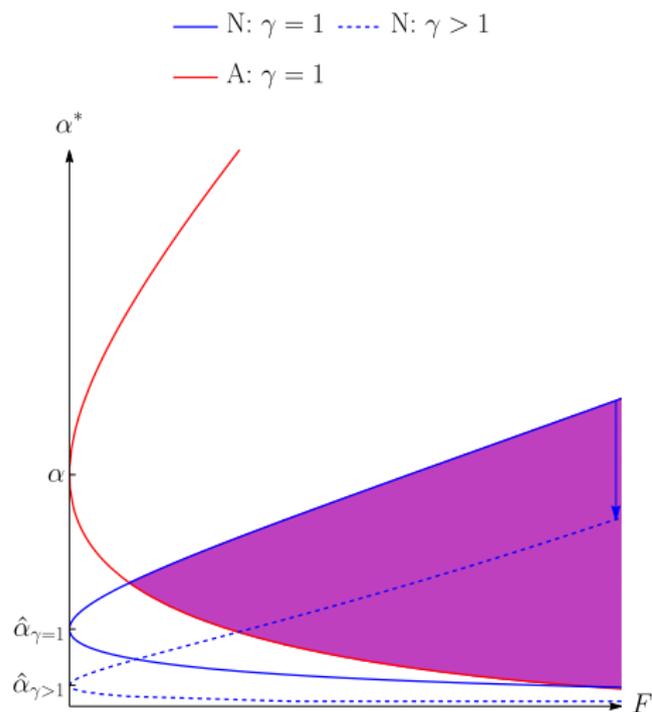
- ▶ Can cooperative harmonization lower welfare relative to Nash?
 - ▶ Yes, because lobbying tends to distort coop standards more than non-coop standards
 - ▶ In non-coop scenario, Foreign sticks to its preferred standard regardless of γ , so lobbying affects only the Home standard.
 - ▶ In coop scenario, increasing γ leads to deregulation in both countries, with or without harmonization, so lobbying has a worse distortionary effect.
 - ▶ If γ is small cooperation still improves welfare, but if γ is large it may decrease welfare.

THE POP CRITIQUE - A QUALIFICATION

- The problem may not lie in the agreement:

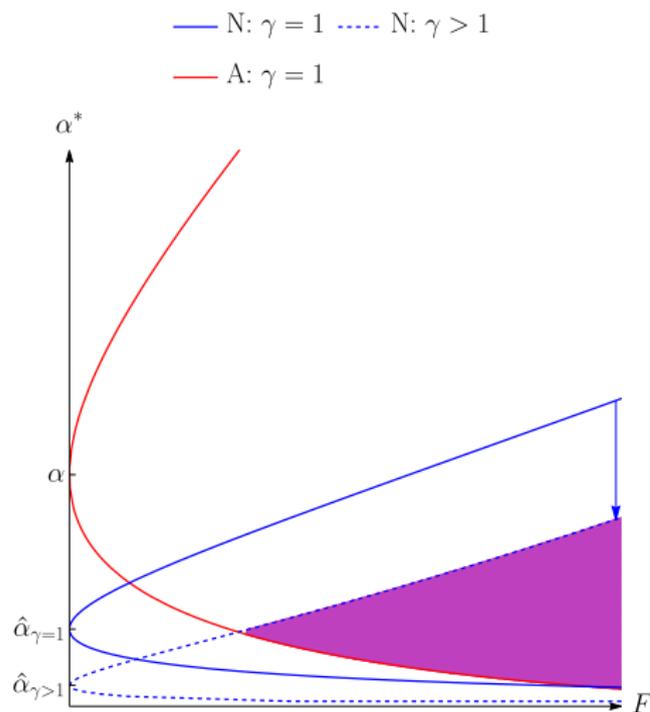


THE POP CRITIQUE - A QUALIFICATION



- ▶ The problem may not lie in the agreement:
 - ▶ Lobbying reduces overlap between spontaneous harmony and efficient harmony regions

THE POP CRITIQUE - A QUALIFICATION



- ▶ The problem may not lie in the agreement:
 - ▶ Lobbying reduces overlap between spontaneous harmony and efficient harmony regions
 - ▶ ...so lobbying reduces the likelihood of efficient spontaneous harmony

OVERVIEW

Basic model

One-way trade

Intra-industry trade

- Non-cooperative equilibrium

- Cooperative equilibrium

- Political economy

Extensions

Conclusion

DUOPOLY

- ▶ Same setting as above, except that now we consider a Cournot duopoly with symmetric firms \rightarrow intra-industry trade à la Brander-Krugman
- ▶ Firms make symmetric profits $\pi(e)$ in the Home market and $\pi(e^*)$ in the Foreign market

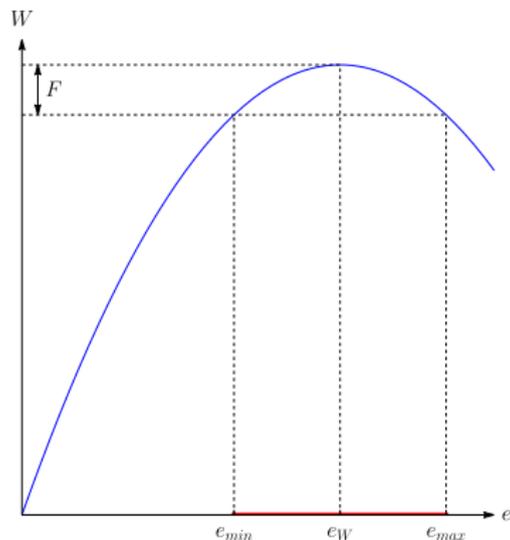
$$\tilde{W} = \underbrace{CS(e) - \alpha E(e) + \pi(e) + \pi(e^*)}_{W(e,e^*)} - n(e, e^*)F$$

$$\tilde{W}^* = \underbrace{CS(e^*) - \alpha^* E(e^*) + \pi(e^*) + \pi(e)}_{W^*(e^*,e)} - n(e, e^*)F$$

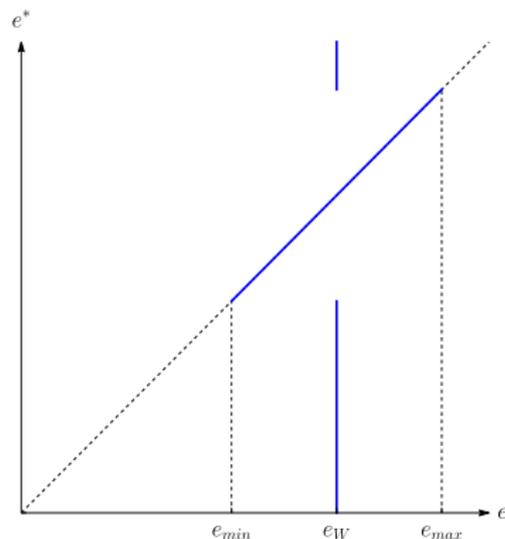
GOVERNMENT REACTION FUNCTIONS

- ▶ Home and Foreign reaction functions are similar, but shifted because $\alpha \neq \alpha^*$

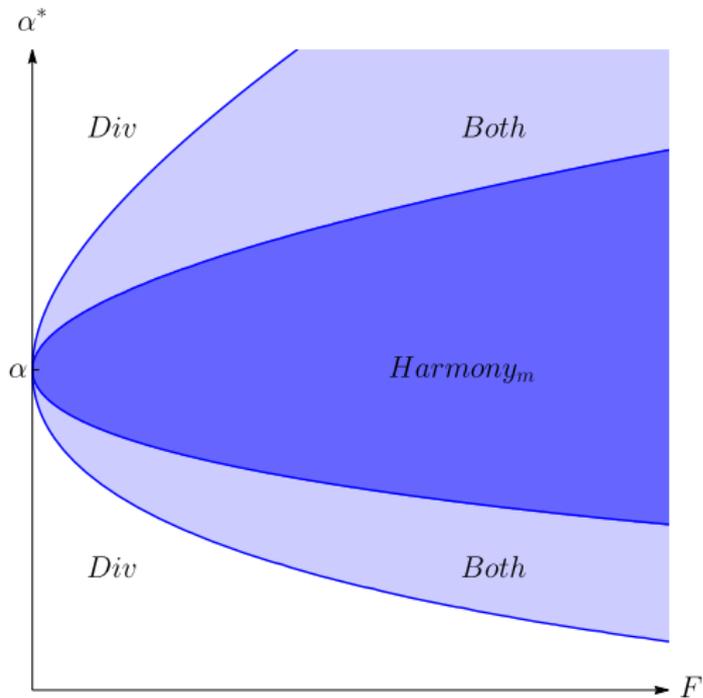
Home tolerance range



Home reaction function

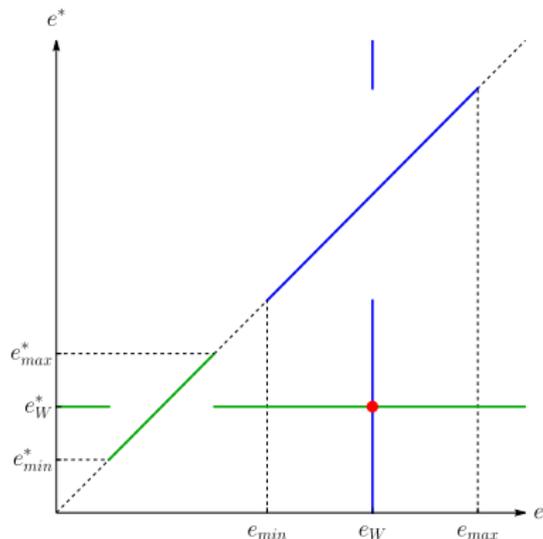
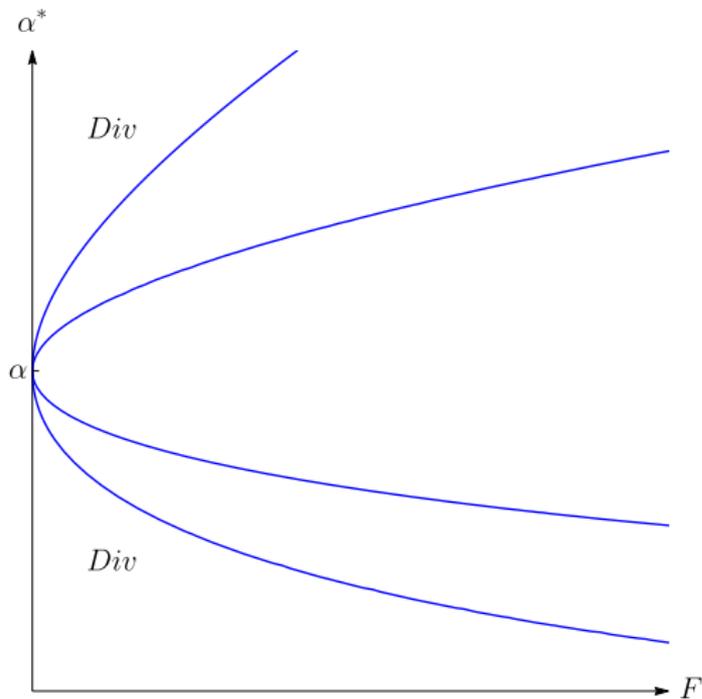


NON-COOPERATIVE EQUILIBRIUM

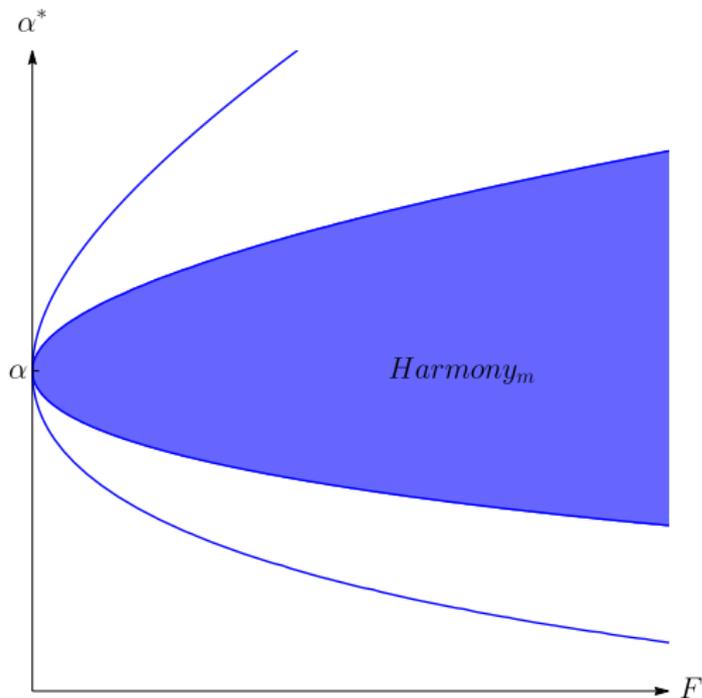


NON-COOPERATIVE EQUILIBRIUM

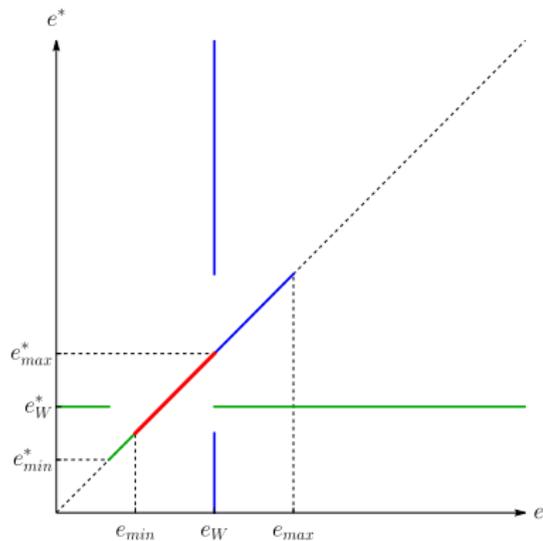
► $\frac{|\alpha^* - \alpha|}{F}$ large \Rightarrow *Div*



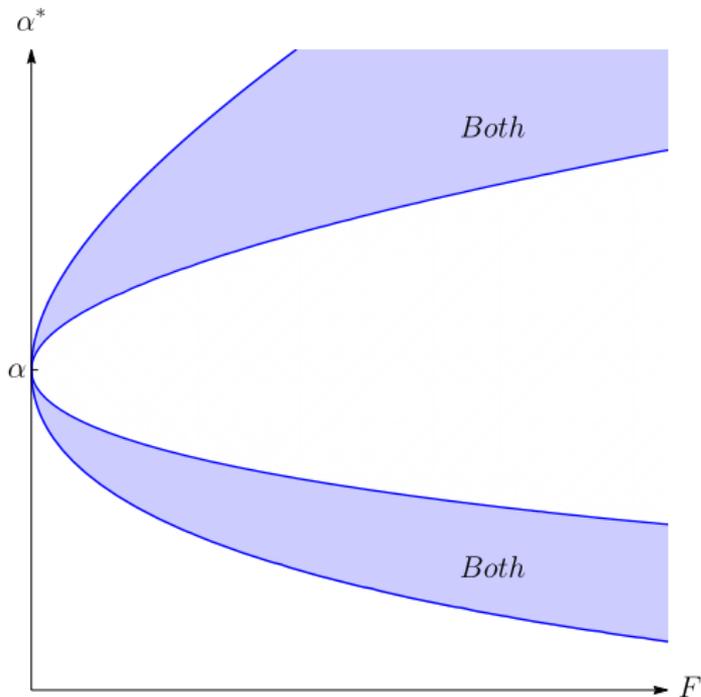
NON-COOPERATIVE EQUILIBRIUM



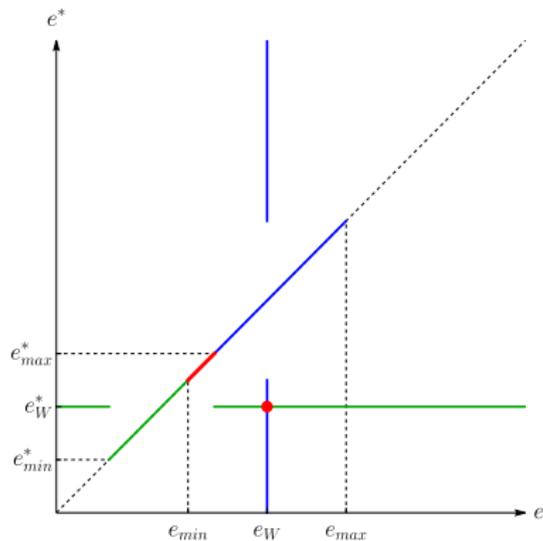
► $\frac{|\alpha^* - \alpha|}{F}$ small \Rightarrow *Multiple Harmony*



NON-COOPERATIVE EQUILIBRIUM

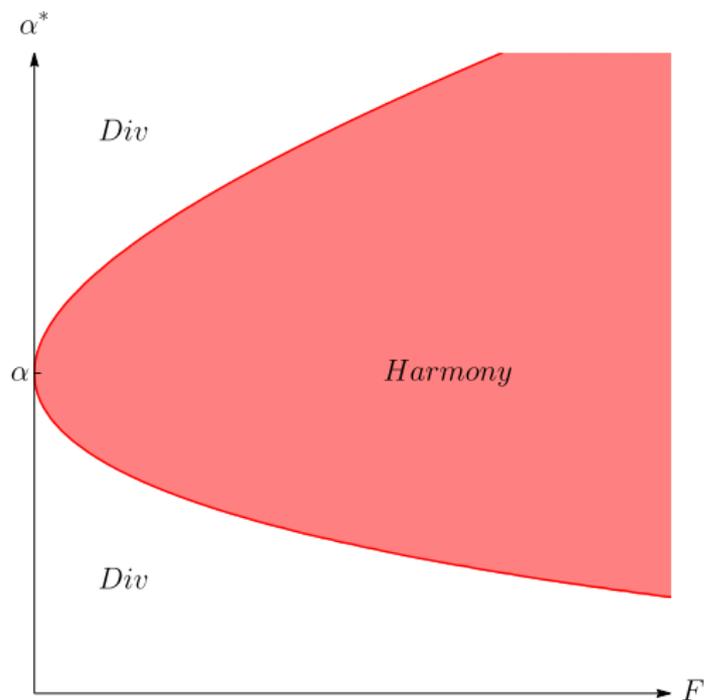


► $\frac{|\alpha^* - \alpha|}{F}$ interm. \Rightarrow Both



COOPERATIVE EQUILIBRIUM

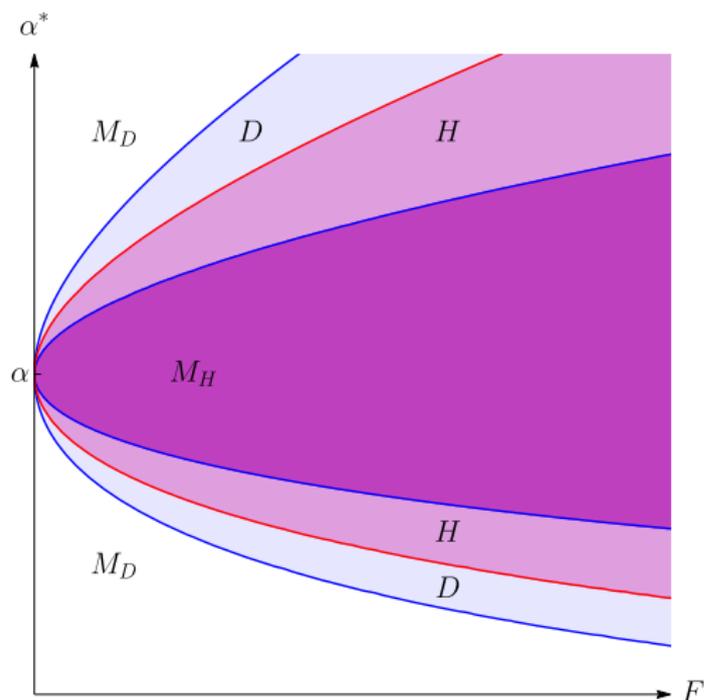
- Qualitatively similar as in monopoly case



ROLE OF REGULATORY AGREEMENTS

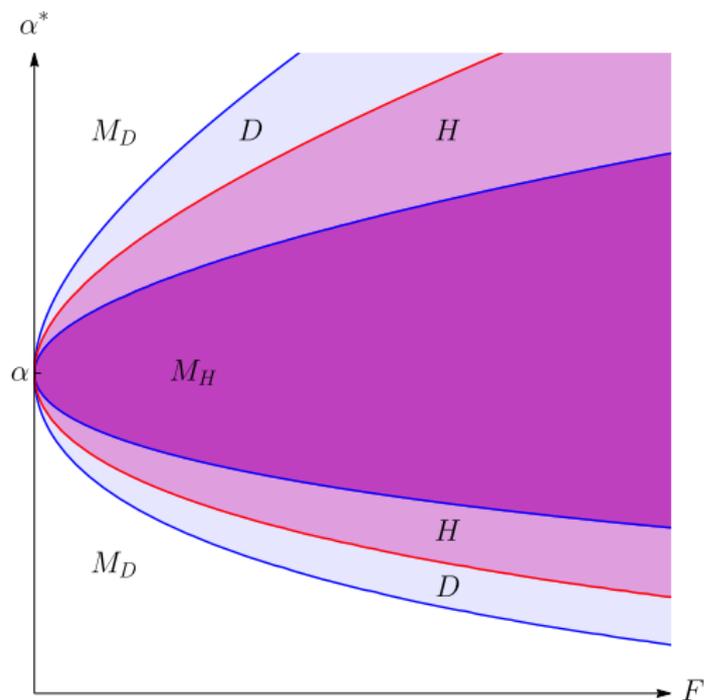
- ▶ International policy externalities: foreign-profit and matching externalities
 - ▶ Similar to monopoly case, but foreign-profit externality is two-ways, and “matching externality” is more symmetric
- ▶ Again, cursory intuition might suggest regulatory harmony is “under-provided” in non-cooperative scenario, but in general this is not the case.
- ▶ Overlay Nash and cooperative parabolas using numerical approach: assume constant-elasticity $c(e)$; consider both linear and constant-elasticity $d(p)$.
 - ▶ Analytical work still in progress

ROLE OF REGULATORY AGREEMENTS



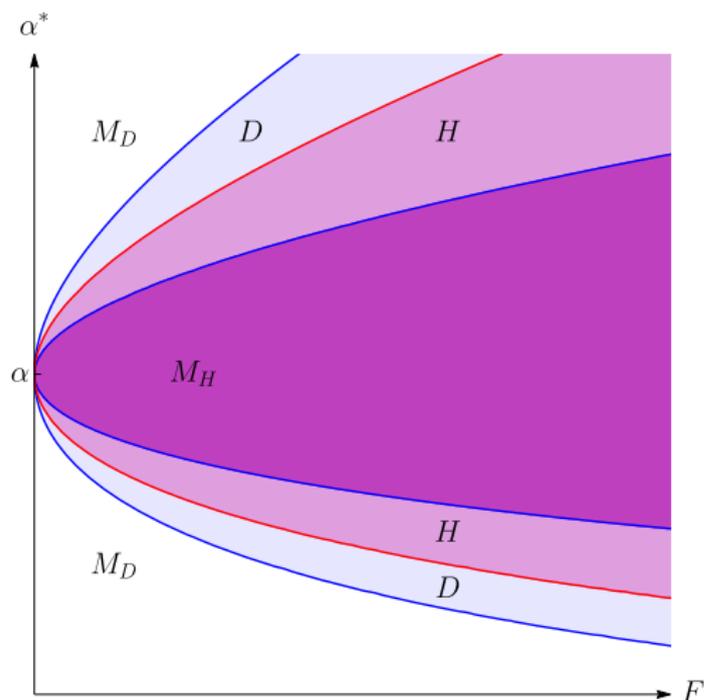
- ▶ The agreement doesn't tinker much with regulatory *regime*, unlike the monopoly case

ROLE OF REGULATORY AGREEMENTS



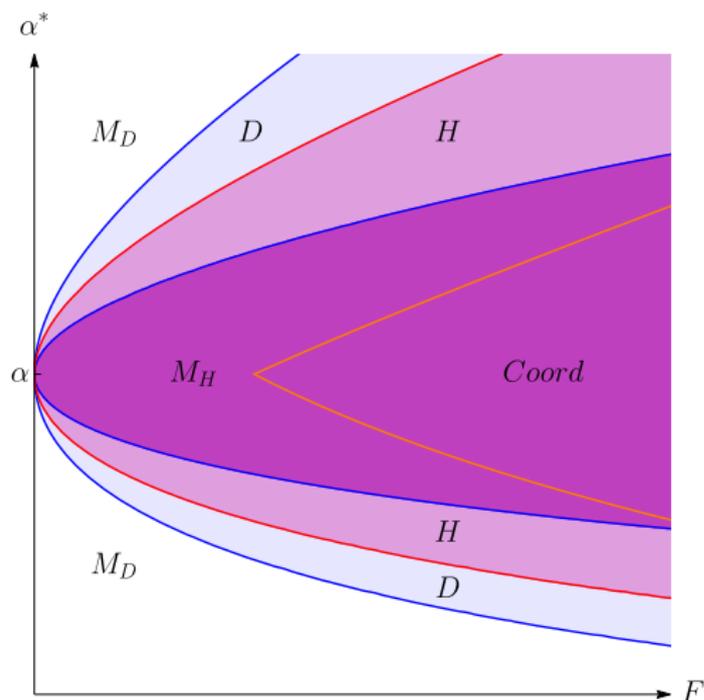
- ▶ The agreement doesn't tinker much with regulatory *regime*, unlike the monopoly case
- ▶ For intermediate $|\alpha - \alpha^*|/F$, the agreement can at best help govts *coordinate* on the efficient regime (H or D)

ROLE OF REGULATORY AGREEMENTS



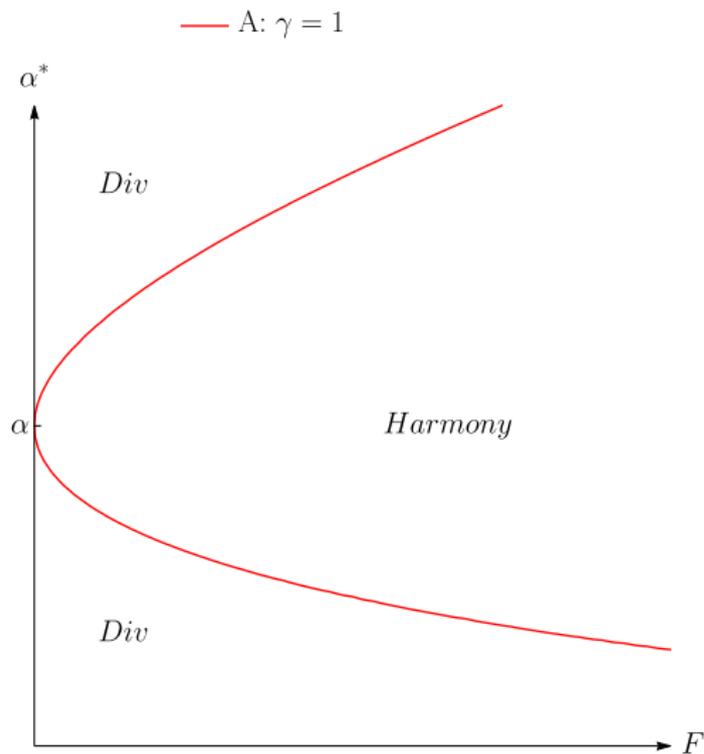
- ▶ The agreement doesn't tinker much with regulatory *regime*, unlike the monopoly case
- ▶ For intermediate $|\alpha - \alpha^*|/F$, the agreement can at best help govts *coordinate* on the efficient regime (H or D)
- ▶ The agreement corrects standards *levels*, but...

ROLE OF REGULATORY AGREEMENTS



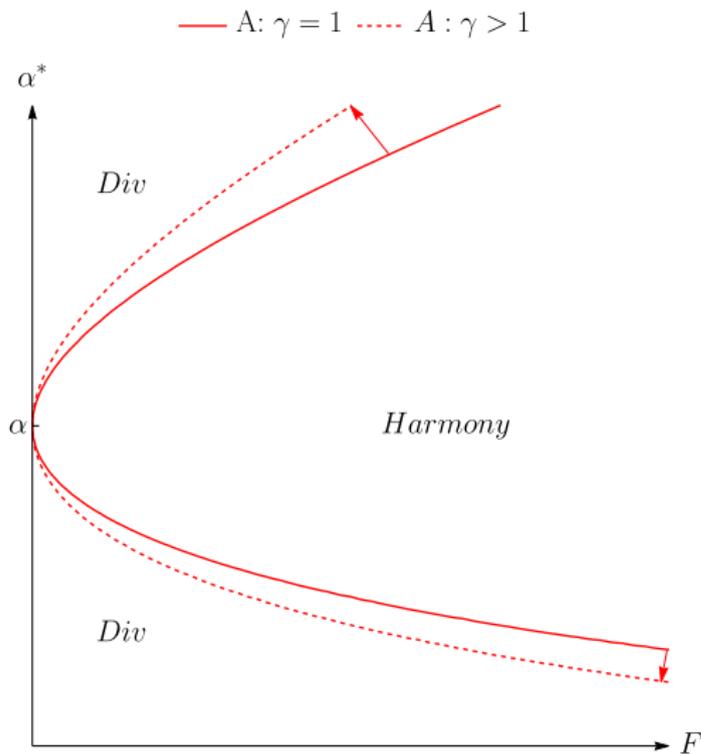
- ...if F relatively large and α close to α^* , efficient standards are a Nash equilibrium, so agreement has at best a pure coordination role

POLITICAL ECONOMY: COOPERATIVE EQUILIBRIUM

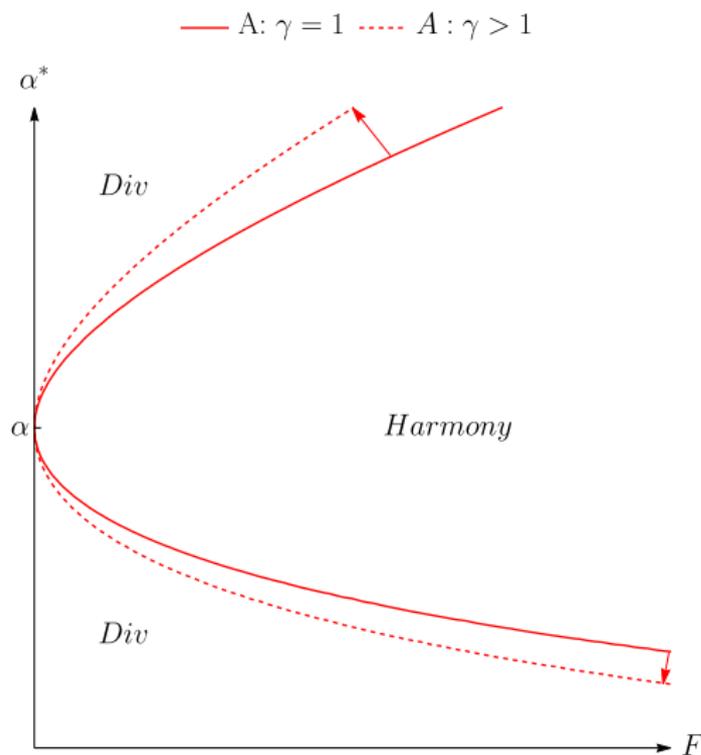


POLITICAL ECONOMY: COOPERATIVE EQUILIBRIUM

- ▶ Lobbying expands the cooperative harmony region



POLITICAL ECONOMY: COOPERATIVE EQUILIBRIUM

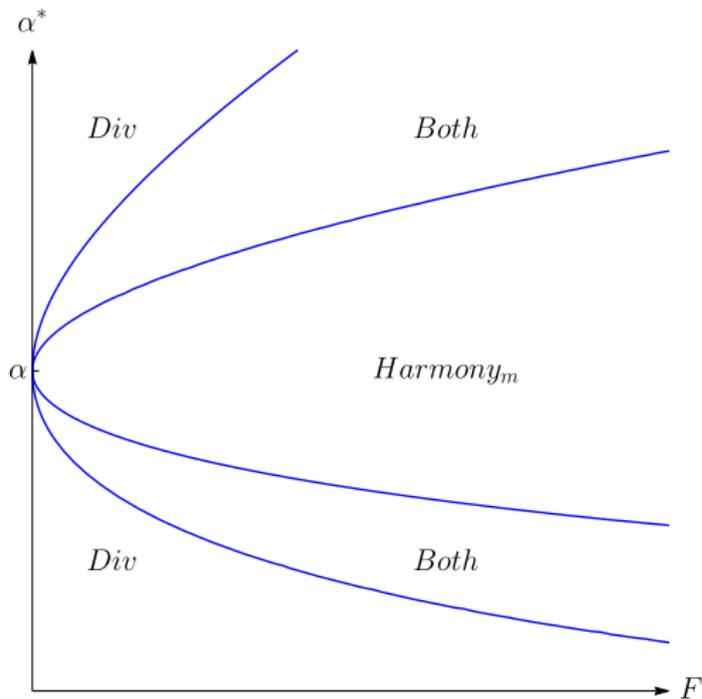


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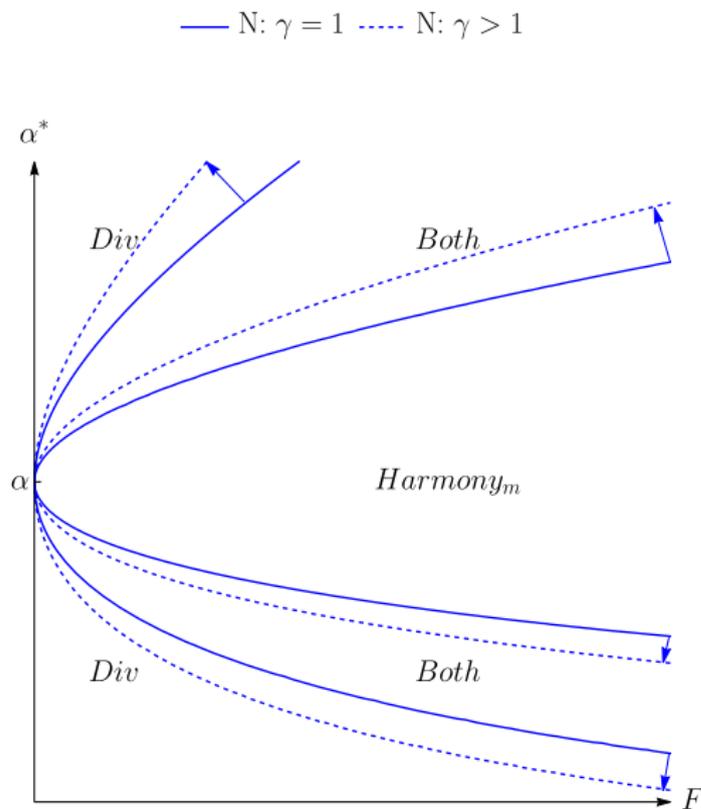
- ▶ Intuition: as in monopoly case, plus, as $\gamma \uparrow$ govts' objectives become more aligned with profits and with each other

POLITICAL ECONOMY: NON-COOPERATIVE EQUILIBRIUM

— N: $\gamma = 1$



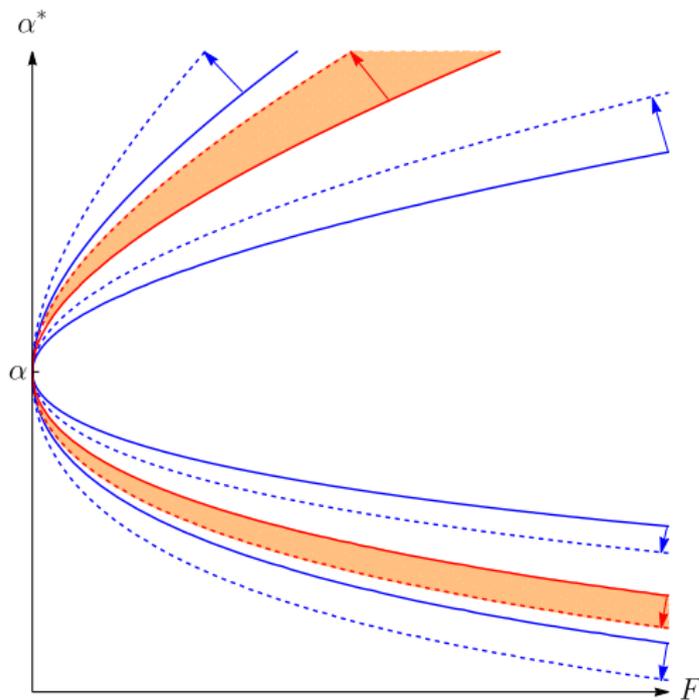
POLITICAL ECONOMY: NON-COOPERATIVE EQUILIBRIUM



- ▶ Unlike the monopoly case, lobbying also makes *spontaneous* harmony more likely

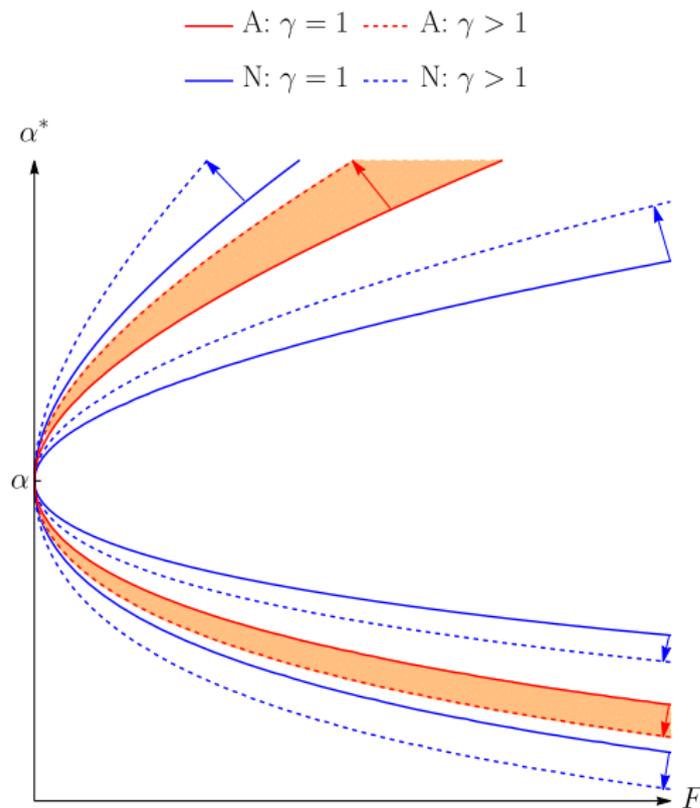
THE POP CRITIQUE

— A: $\gamma = 1$ - - - A: $\gamma > 1$
— N: $\gamma = 1$ - - - N: $\gamma > 1$



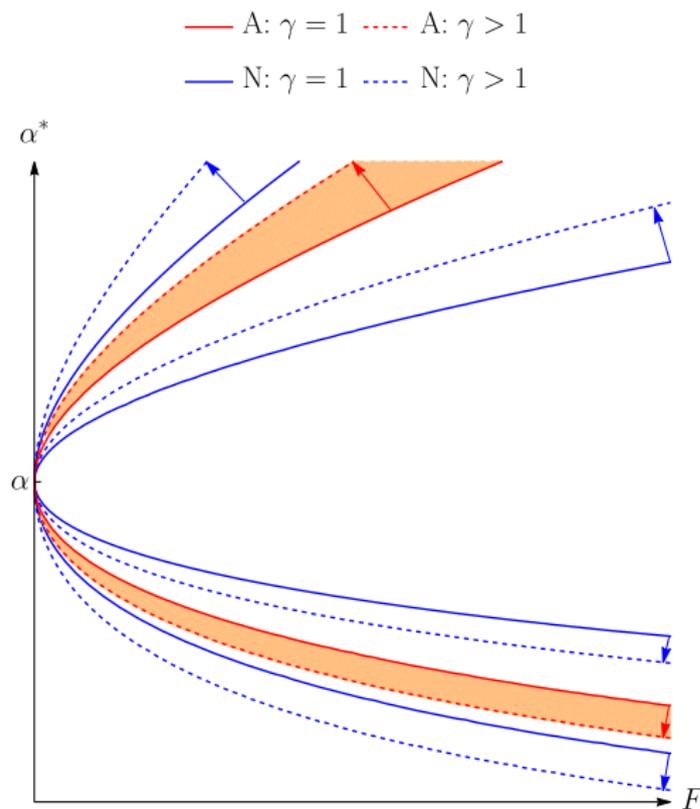
- Under lobbying, agreement may entail inefficient harmony

THE POP CRITIQUE



- ▶ Under lobbying, agreement may entail inefficient harmony
- ▶ Recall: the agreement doesn't tinker much with the regulatory regime

THE POP CRITIQUE



- ▶ Under lobbying, agreement may entail inefficient harmony
- ▶ Recall: the agreement doesn't tinker much with the regulatory regime
- ▶ So while lobbying may lead to inefficient harmony, the problem is not brought about by the agreement, it's already present in the non-coop scenario

OVERVIEW

Basic model

One-way trade

Intra-industry trade

Extensions

- Complete policy instruments

- Extensive margin

Conclusion

COMPLETE POLICY INSTRUMENTS

- ▶ Suppose each gov can use lump-sum transfers/taxes
 - ▶ Then Nash equilibrium is efficient: Foreign gov sets the standard to maximize total surplus and uses the transfer to extract all profits from Home firm
 - ▶ Thus If Foreign gov can write a perfect contract with Home firm, this is a perfect substitute for an international contract between Home and Foreign gov
 - ▶ Reminiscent of the efficiency of first-degree price discrimination

- ▶ There is a role for international regulatory cooperation only in a second-best world where governments do not have a complete set of policy instruments

FIRM'S BREAK-EVEN CONSTRAINT

- ▶ Firm will serve a given market if it can break even
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- ▶ If $e = e^*$, firm serves both markets iff $e = e^* \geq \hat{e}(\frac{F}{2})$
- ▶ In what follows, assume α and F such that Firm always serves Home market ($e_W(\alpha) \geq \hat{e}(F)$)

FOREIGN REACTION FUNCTION - PARTICIPATION CONSTRAINT

$$\max_{e^*} W^*(e^*) \quad s.t. \quad (PC)$$

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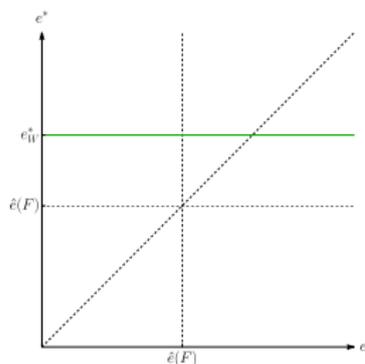
- *PC* binding iff $e_W^*(\alpha^*) < \hat{e}(F) \rightarrow F > \hat{F}(\alpha^*)$, where $\hat{F}'(\cdot) < 0$

FOREIGN REACTION FUNCTION - PARTICIPATION CONSTRAINT

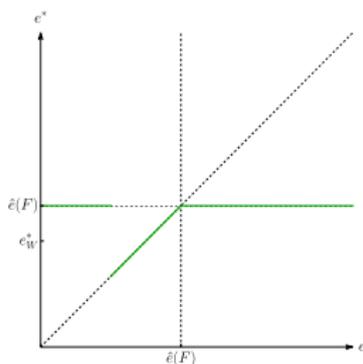
$$\max_{e^*} W^*(e^*) \quad \text{s.t.} \quad (PC) \quad e_W^* = \arg \max_{e^*} W^*(e^*)$$

► PC binding iff $e_W^*(\alpha^*) < \hat{e}(F) \rightarrow F > \hat{F}(\alpha^*)$, where $\hat{F}'(\cdot) < 0$

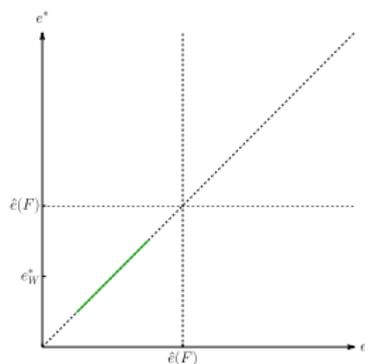
$$e_W^*(\alpha^*) > \hat{e}(F)$$



$$e_W^*(\alpha^*) < \hat{e}(F)$$



$$e_W^*(\alpha^*) \ll \hat{e}(F)$$



IMPLICATIONS OF FIRM'S BREAK-EVEN CONSTRAINT

- ▶ Multiple harmony equilibria may arise even with one-way trade

IMPLICATIONS OF FIRM'S BREAK-EVEN CONSTRAINT

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- ▶ Cooperative harmony may create trade at the extensive margin

IMPLICATIONS OF FIRM'S BREAK-EVEN CONSTRAINT

- ▶ Multiple harmony equilibria may arise even with one-way trade
- ▶ Cooperative harmony may create trade at the extensive margin
- ▶ Under lobbying, agreement may inefficiently harmonize and create welfare-reducing trade

OVERVIEW

Basic model

One-way trade

Intra-industry trade

Extensions

Conclusion

CONCLUSION

- ▶ The role of regulatory agreements depends crucially on whether trade is one-way or two-way in a given industry
- ▶ If trade is one-way:
 - ▶ Cooperation may promote harmony or diversity, and it always corrects standards levels
 - ▶ Under some conditions there is “spontaneous harmony” but the agreement encourages diversity
 - ▶ Under lobbying a harmonization agreement is more likely, and can reduce welfare (Pop Critique)
- ▶ If trade is intra-industry:
 - ▶ Agreements play more of a coordination role in terms of regulatory regime
 - ▶ Under some conditions they play a *pure* coordination role
 - ▶ Lobbying can lead to inefficient harmonization, but it is not agreements *per se* that cause the problem.

Thank you!

COST OF REGULATORY DIVERSITY

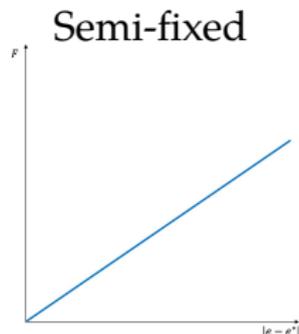
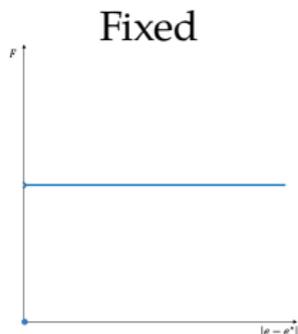
*“... is usually a **fixed cost**. You pay for this certification once from time to time, and this cost is not related to the volume traded.”*

(Lamy, 2015)

COST OF REGULATORY DIVERSITY

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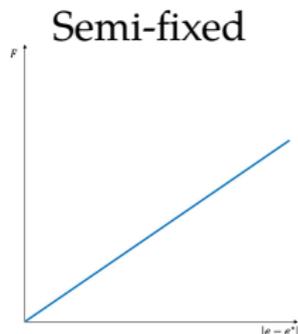
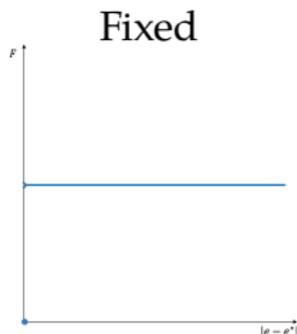
- ▶ Two types of fixed costs:



COST OF REGULATORY DIVERSITY

*“... is usually a **fixed cost**. You pay for this certification once from time to time, and this cost is not related to the volume traded.”*
(Lamy, 2015)

- ▶ Two types of fixed costs:



- ▶ OECD (2017):
 1. Information costs → fixed or semi-fixed
 2. Specification costs → fixed or semi-fixed
 3. Conformity assessment costs → fixed

COSTS OF CONFORMITY ASSESSMENT

Product standard

▶ Back

COSTS OF CONFORMITY ASSESSMENT

Product standard

Conformity assessment procedure

▶ Back

COSTS OF CONFORMITY ASSESSMENT

Product standard

Conformity assessment procedure

Conformity assessment agency

▶ Back

COSTS OF CONFORMITY ASSESSMENT

Product standard

Conformity assessment procedure

Conformity assessment agency



▶ Back

COSTS OF CONFORMITY ASSESSMENT

Product standard

Conformity assessment procedure

Conformity assessment agency

If all harmonized



one certification
for all markets

▶ Back

LOBBYING AND SPONTANEOUS HARMONY

- ▶ Harmony and Div are equally efficient iff

$$\gamma F = \underbrace{W(e_W) - W(e_W^*)}_L$$

- ▶ $\gamma \uparrow$ tilts the balance towards Harmony iff $\varepsilon_{L,\gamma} < 1$.
- ▶ Differentiating L with respect to γ and applying the envelope theorem yields:

$$\varepsilon_{L,\gamma} < 1 \Leftrightarrow \tilde{C}S(e_W) - \tilde{C}S(e_W^*) > 0 \text{ where } \tilde{C}S = CS - \alpha E$$

- ▶ When $\alpha^* < \hat{\alpha} < \alpha$, $\tilde{C}S(e_W) - \tilde{C}S(e_W^*) > 0$.
- ▶ When $\hat{\alpha} < \alpha^* < \alpha$, $\tilde{C}S(e_W) - \tilde{C}S(e_W^*) < 0$.
- ▶ When $\hat{\alpha} < \alpha < \alpha^*$, α^* not too large, $\tilde{C}S(e_W) - \tilde{C}S(e_W^*) < 0$.

LOBBYING AND COOPERATIVE HARMONY

- ▶ Harmony and Div are equally efficient if

$$\gamma F = \max_{e, e^*} S^w - \max_{e=e^*} S^w \equiv L, \quad \text{where } S^w \equiv \tilde{C}S^w + \gamma\pi^w$$

- ▶ $\gamma \uparrow$ tilts the balance towards Harmony iff $\varepsilon_{L, \gamma} < 1$
- ▶ Applying envelope thm and simplifying: $\varepsilon_{L, \gamma} < 1$ iff $\tilde{C}S_{Div}^w > \tilde{C}S_{Harm}^w$ (world consumers better off under Div)
- ▶ FOCs: $\tilde{C}S'(e_s) + \gamma\pi'(e_s) = 0$ and $\tilde{C}S^*(e_s^*) + \gamma\pi'(e_s^*) = 0$
- ▶ If $\pi'(e)$ is diminishing and e_H not too far from $\frac{e_S + e_S^*}{2}$, the higher- e country has lower marginal consumer loss, hence moving standards toward each other reduces $\tilde{C}S^w$, and therefore $\varepsilon_{L, \gamma} < 1$

▶ Back