Lecture 4: Trade Policy

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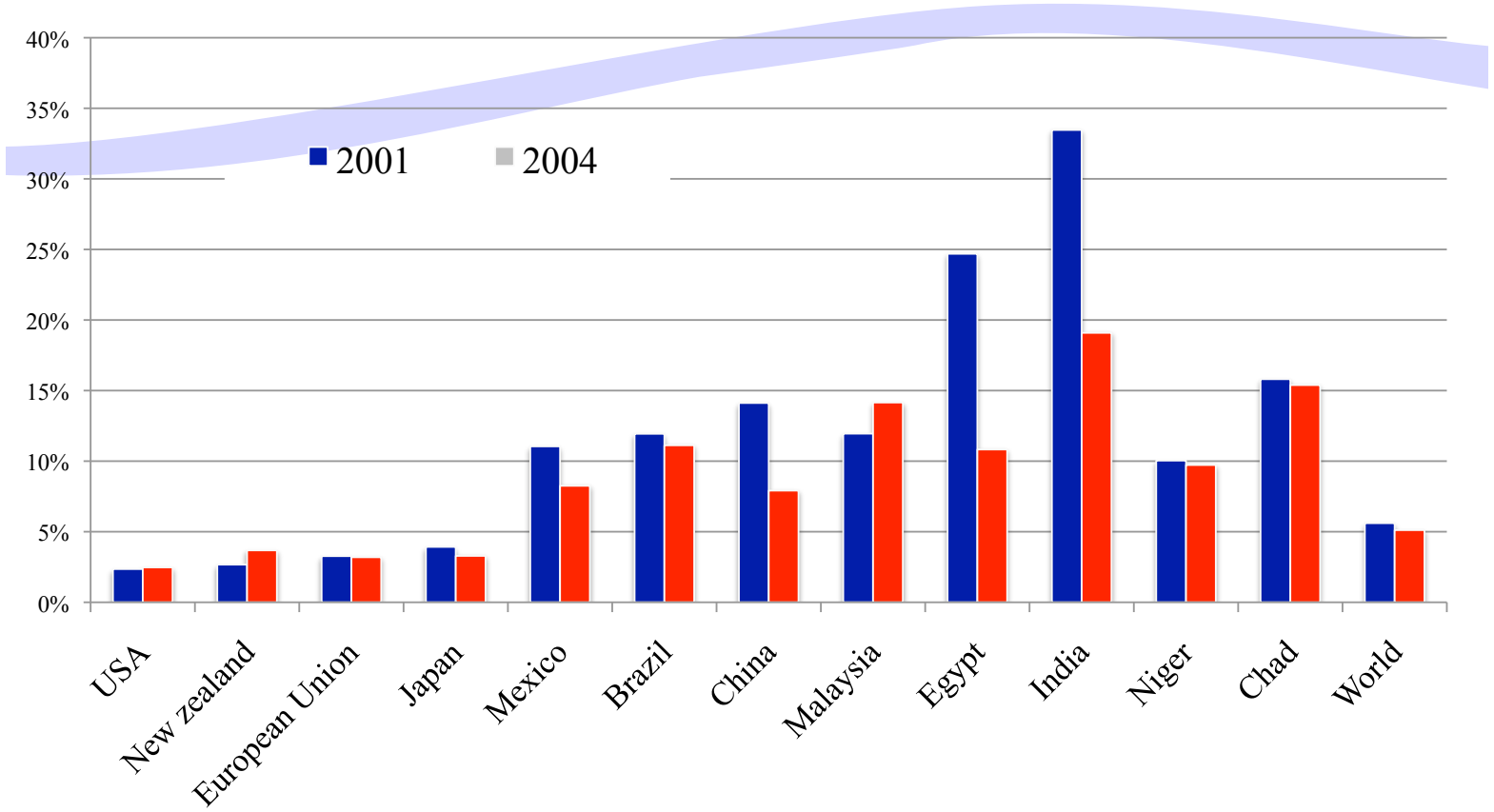
Overview

- Trade policy under perfect competition
- Multilateral trade negotiations
- Regional trade agreements
- The political economy of trade protection

Average protection by countries in 2001 and 2004



Source : Boumelassa, Laborde & Maritonna (2009)

Average protection by category of country and goods in 2004

Goods	World	HICs	MICs	LDCs
Agricultural goods	18.9	18.0	20.8	14.1
of which:				
Primary and semi-processed	*12.8*	*12.1*	*14.2*	*9.5*
Final	*22.8*	*21.7*	*25.4*	*16.8*
Industrial goods	4.4	2.7	8.9	11.7
of which:				
Primary and semi-processed	*2.8*	*1.2*	*6.2*	*10.9*
Final	*5.0*	*2.9*	*9.9*	*11.9*
Extraction and energy products	1.9	0.6	5.6	12.7
of which:				
Primary and semi-processed	*1.4*	*0.3*	*4.6*	*14.4*
Final	*3.3*	*1.4*	*7.6*	*11.2*
All products	**5.1**	**3.3**	**9.6**	**12.2**
of which:				
Primary and semi-processed	*3.3*	*1.8*	*6.8*	*11.4*
Final	*6.0*	*3.9*	*11.0*	*12.4*

Source : Boumelassa, Laborde & Maritonna (2009)

Trade Policy under Perfect Competition

Road map

- Trade policy : rationale and instruments
- The equivalence between tariffs and export subsidies
- Impact of a tariff in a small country / in a large country
- Measuring the cost of protection
- Optimal tariffs

Why protecting ?

- From the old/new theories of international trade, we know that international trade is welfare-improving (efficiency gains + increase diversity) $\Rightarrow$ What justifies protecting ?

i) A way for large countries to **manipulate terms of trade**

ii) **Protecting infant industries** (H. List, 1841) :

- Fixed costs, increasing returns to scale
- Liquidity constraints

iii) **Protectionism as a second-best**

- Coping with market imperfections. Ex. : organizing labor reallocation out of declining industries
- Coping with the difficulty to enforce lump-sum transfers in favor of "globalization losers" (e.g. low-skilled workers)

Why protecting ? (2)

iv) **Political-economy arguments** :

- Special interests ("demand for protection", see below)
- Distortion created by voting mechanisms, e.g. over-representation of rural areas in Parliaments
- "Oil-in-the-wheels" approach : free-trade better enforced with a dose of protectionism ?

v) **Fiscal role of tariffs** :

- Until the introduction of the income tax, the US government raised most of its revenue from tariffs
- In Côte d'Ivoire and Democratic Republic of Congo, 28% of public revenues are generated by tariffs

$\Rightarrow$ **Economic theory does not support free trade under *any* set of assumptions. But it always advises using direct transfers rather than distorting prices through tariffs, taxes and subsidies**

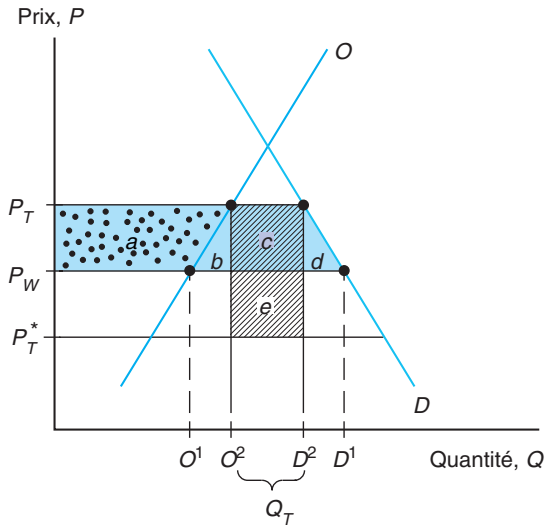
Trade policy instruments

- **Tariffs**
  - + Specific tariffs (based on volume)
  - + Ad-valorem tariffs (based on value)
  - + Specific or ad-valorem export subsidies
- **Non-tariff protection**
  - + Import and export quotas (ex : US import quota on cheese, Multi-Fiber Arrangement restricting textile exports)
  - + Export and import price control
  - + Regulatory hurdles (ex : technical and sanitary norms, national security rules)
  - + Local content rules (ex : culture)
- **Other instruments**
  - + Output subsidies

Costs and Benefits Analysis

- Consider an economy which autarky price is higher/lower than the world price $\Rightarrow$ Net imports/exports
- Government uses trade policy to reduce the amount of imports/rise the amount of exports and support domestic industry
- Analysis of the trade policy using a cost-benefit analysis :
  - Impact on the consumer surplus
  - Impact on the producer surplus
  - Revenue for the government
- Note that this implicitely assumes the direct gains to producers and consumers accurately measure the social gains
- Two alternative assumptions :
  - Small economy $\Rightarrow$ No impact of the tariff on world prices
  - Large economy $\Rightarrow$ Import demand drop induces a decrease in the world price

Ad-valorem tax τ



a+b+c+d=Consumer Loss, a=Producer gain, c+e=Government revenue, b+d=Efficiency loss, e=terms of trade gain

- In a small economy, the new import price is $P_T = P_W + \tau$
- In a large economy, the world price adjusts as well
  $\Rightarrow$ World price $\downarrow$, domestic price $\uparrow$, in equilibrium $P_T - P_T^* = \tau$
- In any case, imports decrease
- Efficiency loss induced by prices being distorted, Terms of trade gain if export price goes down $\Rightarrow$ **Net gain if country big enough**

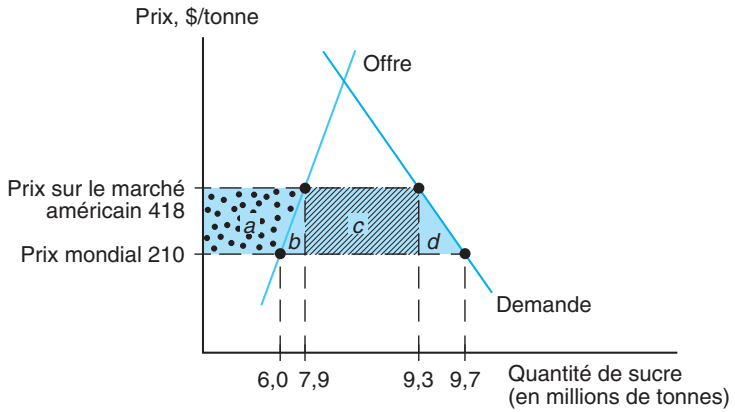
Import quota

- Direct restriction on the imported quantity enforced by issuing licenses to some group of individuals (trading companies, government of exporting countries)
- Impact of the quota on equilibrium price : At the initial price, the domestic demand exceeds domestic supply + imports $\longrightarrow$ Domestic price $\uparrow$ until the market clears
- In the end, domestic prices increase by the same amount as a tariff that limits imports to the same level
- The difference concerns the individuals that gain : Government receives the revenue of a tariff, License holders (domestic or foreign) enjoy the benefit of quota rents
- A voluntary export restriction has exactly the same impact as a quota which rent is attributed to the foreign country

Case study : US quota on Sugar

Impact of the quota (1990 estimates)

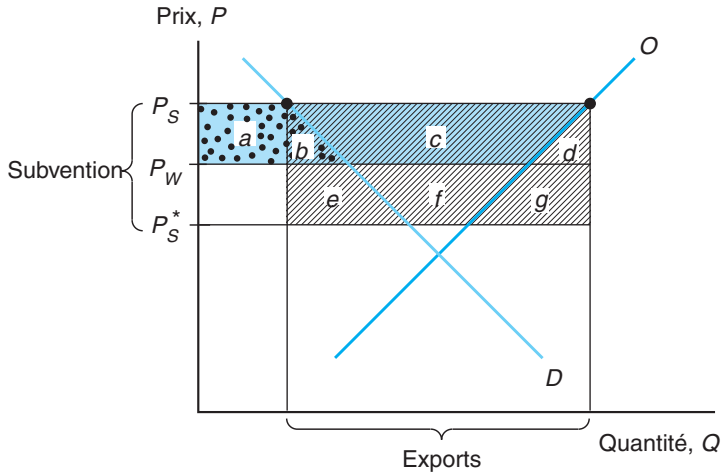
Krugman & Obstfeld based on Hufbauer & Elliott (1994) estimates



US assumed to be "small" in the world sugar market. a+b+c+d=Consumer Loss, a=Producer gain, c=Quota rent, b+d=Efficiency loss, e=terms of trade gain

- Import quota on sugar maintains US domestic prices
- Quota rent distributed to foreign governments
- Efficiency loss in the US
- Cost for consumer estimated at about USD6/capita, Gain for the sugar industry of about USD90,000/employee

Export Subsidy τ



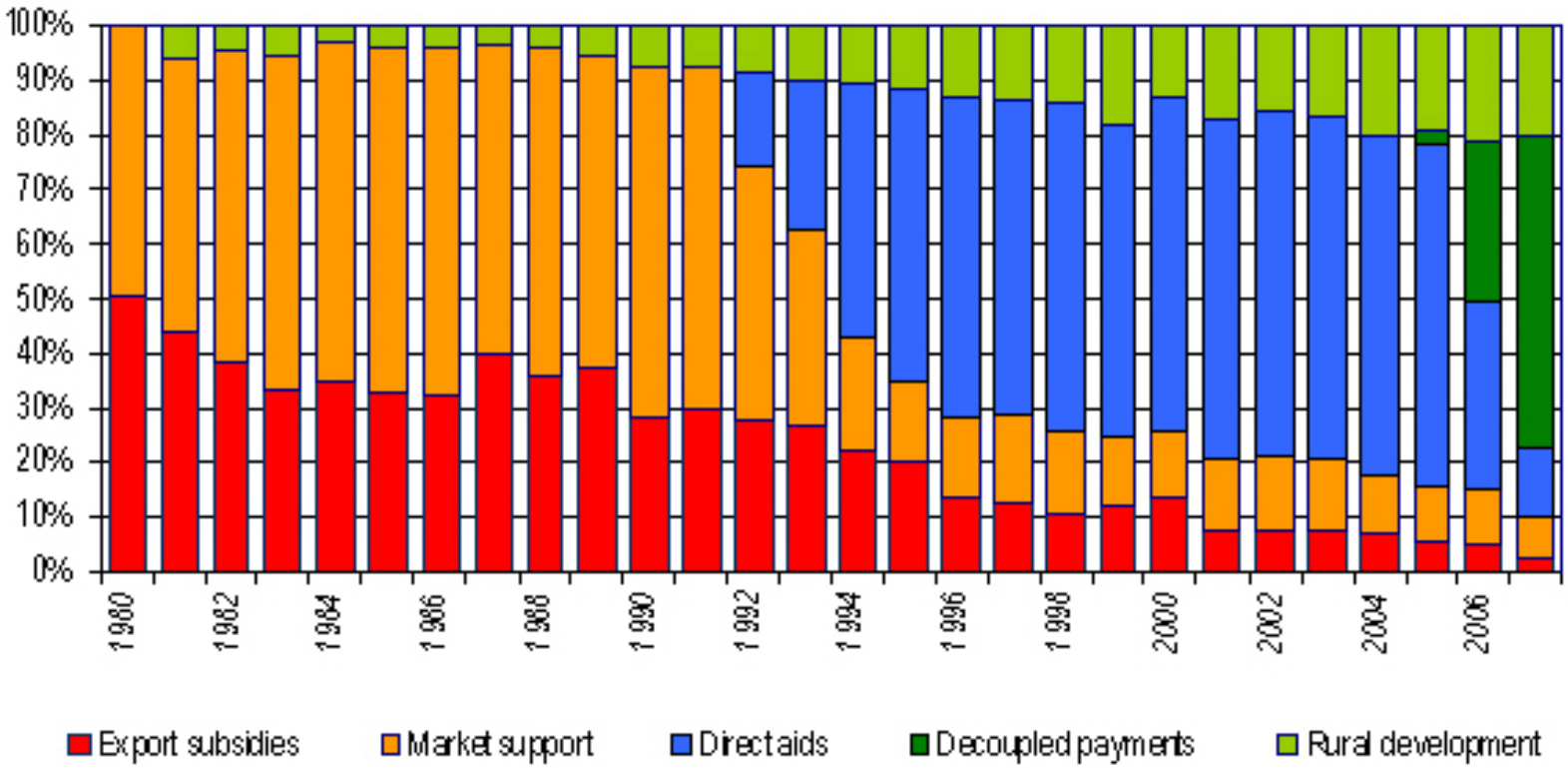
a+b=Consumer Loss, a+b+c=Producer gain, b+c+d+e+f+g=cost of government subsidy

- In a small economy, the price in the exporting country increases to $P_S = P_W + \tau$
- In a large economy, the world price adjusts as well
  $\Rightarrow$ World price $\downarrow$, domestic price $\uparrow$, in equilibrium $P_S - P_S^* = \tau$
- In any case, exports increase
- Efficiency loss induced by prices being distorted, Terms of trade loss

Case study : Europe's CAP

- EU's Common Agricultural Policy initially meant to guarantee prices to European farmers $\Rightarrow$ EU was buying agricultural products whenever prices fell below some thresholds
- Problem in the 70s due to too high support prices $\Rightarrow$ Production $>$ Demand $\Rightarrow$ EU was buying and storing huge quantities
- In the 80s, EU turned to a policy of export subsidies
- Huge cost for EU countries : support price above the autarky price $\rightarrow$ Huge exports that depress world prices $\rightarrow$ Increases further the cost of export subsidies $\Rightarrow$ Until 1992, agriculture expenditure of the European Union $\approx$ 49% of the budget
- Little internal challenge (strong power of farmers) but huge pressures from food-exporting nations(US and Latin America) $\rightarrow$ By 2013, the share of traditional CAP spending is projected to decrease significantly to 32% of the EU's budget

Gradual decoupling of CAP payments



Source : European Commission

Since 2003, "decoupling" of subsidies to specific corps under some conditions on environmental, food safety and animal welfare standards

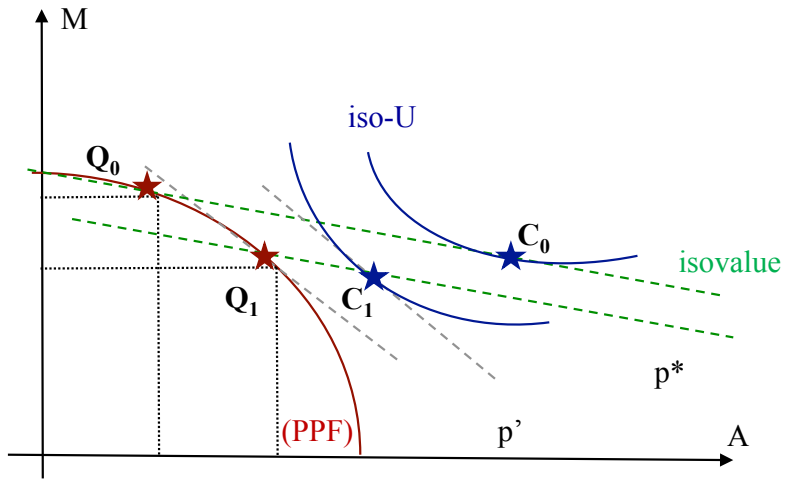
General Equilibirum Analysis

Small country exports good M and imports good A at the exogenous world price : $p^* = p^A/p^M$:

– Production in Q_0 (PPF where $MRT = p^*$)
– Set of possible consumption baskets : isovalue line with slope p^* starting from Q_0
–Consumption in C_0 where $MRS = p^*$

Tariff τ set on agricultural imports :

– Price becomes $p' = (1+\tau)p^*$ for domestic producers and consumers
– Country budget line remains $X^M = p^* M^A$
– Production becomes Q_1 (PPF where $MRT = p'$)
– Consumption becomes C_1 on budget line with slope p^* starting from Q_1



Welfare decreases because production does not maximize the value of income at world prices + Consumers do not choose the welfare-maximizing point on the budget constraint

General Equilibirum Analysis (2)

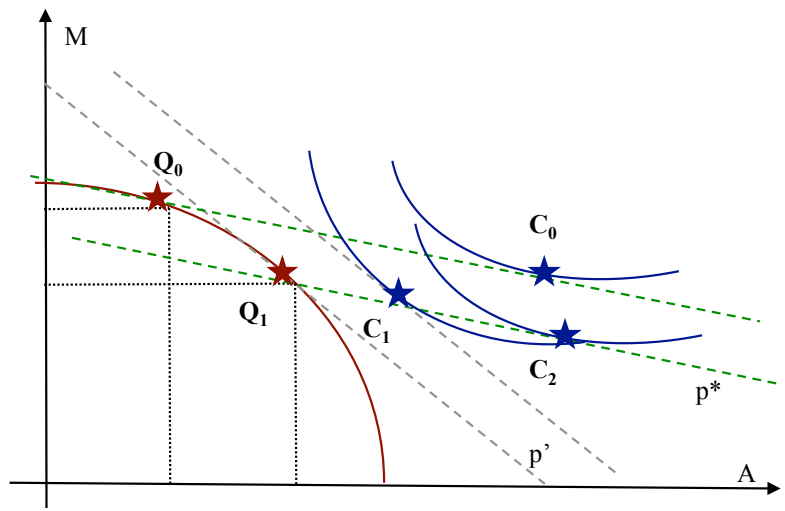
Step 1 : Instead of a tariff, government grants subsidy τ to output price

– Production price becomes $p' = (1+\tau)p^*$ and consumption price is unchanged at p^*

– $MRT = p'$ and $MRS = p^* \rightarrow$ equilibrium becomes (Q_1, C_2)

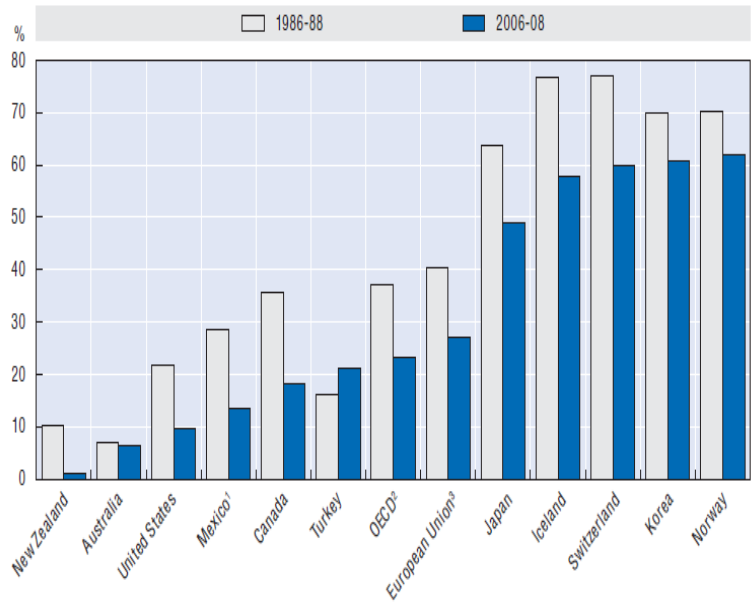
Step 2 : Government taxes consumption, which moves from C_2 to C_1

Tariff is equivalent to combination of output subsidy and consumption tax

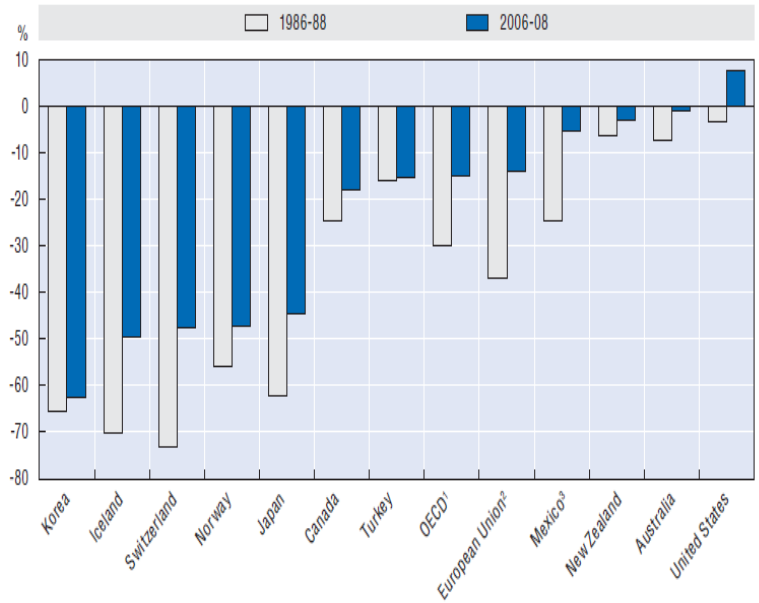


Producer support and cost to consumers in agriculture

Support as % of gross farm receipts



Cost to consumers as % of consumption expenditure at farm gate



OECD, 2009

Measuring the cost of protection

Sharing of surplus :
- Producer surplus : **a**
- Consumer surplus : **-(a+b+c+d)**
- Government surplus : $\tau\ M_2$ **=c**
- Net social surplus : Δ**S = - (b + d)**

b : production distortion
d : consumption distortion

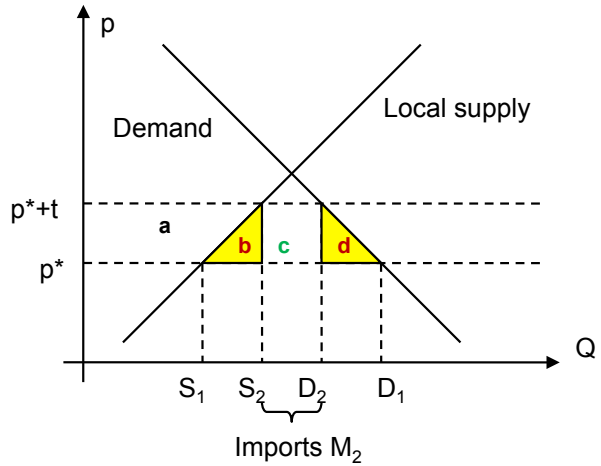
Social loss :

$$\Delta S = b + d = \frac{\tau}{2}\Delta M = \frac{\tau^2}{2}\frac{\partial M}{\partial p}$$

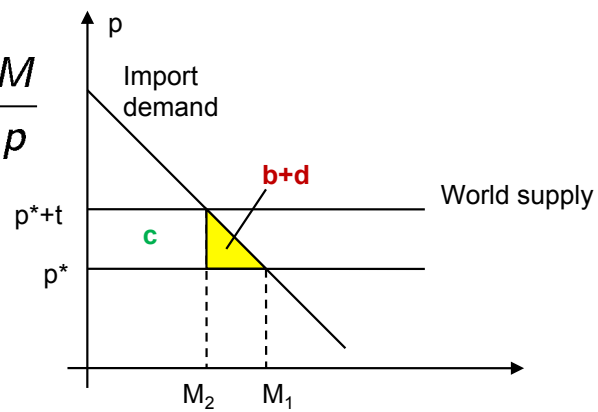
$$\frac{\Delta S}{pM} = -\frac{1}{2}\left(\frac{\tau}{p}\right)^2 \varepsilon^M \quad where \quad \varepsilon^M = \frac{\partial \ln M}{\partial \ln p}$$

- Ex : $\varepsilon^M = 8$ and $\tau/p = 10\% \Rightarrow \Delta S/pM = 4\%$

Local Market



World Market



Measuring the cost of protection

- In a small country under perfect competition, the social cost of trade protection is :

$$\frac{\Delta S}{pM} = \frac{1}{2}\left(\frac{\tau}{p}\right)^2 \varepsilon^M \quad with \quad \varepsilon^M = \left|\frac{dlnM}{dlnp}\right|$$

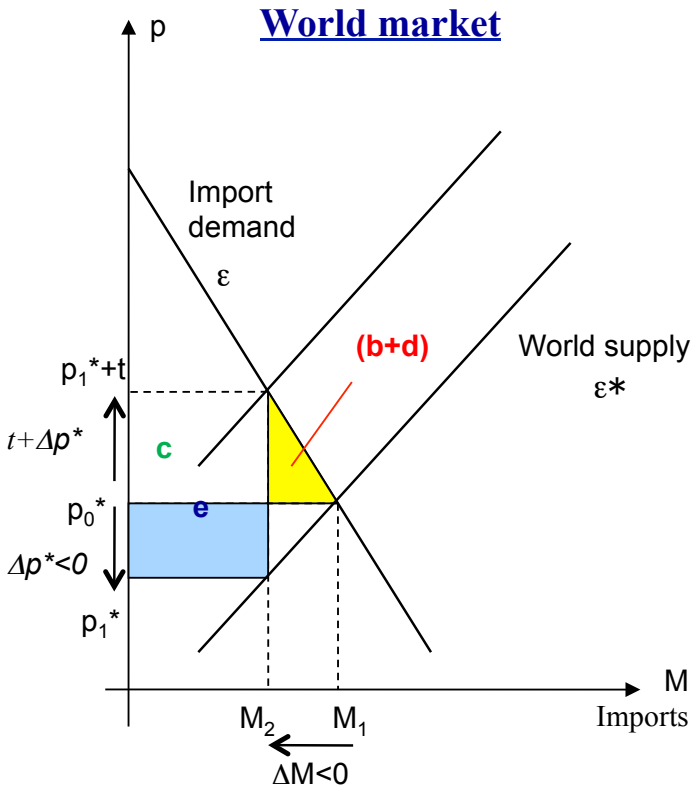
- In % of GDP :

$$\frac{\Delta S}{Y} = \frac{1}{2}\left(\frac{\tau}{p}\right)^2 \varepsilon^M \alpha \quad with \quad \alpha = \frac{pM}{Y}$$

$\Rightarrow$ **Cost of protection depends on weight of imports, price-elasticity of imports, and squared tariff**

$\Rightarrow$ **The welfare cost of increasing a tariff depends on its initial level**

Optimal tariff



- Tariff $\tau > 0$ in a large country improves terms of trade but distorts supply and demand
- Net effect depends on how much world price p^* decreases in response to tariff
- Let ε and ε^* be the (positive) price-elasticities of import demand and world supply :

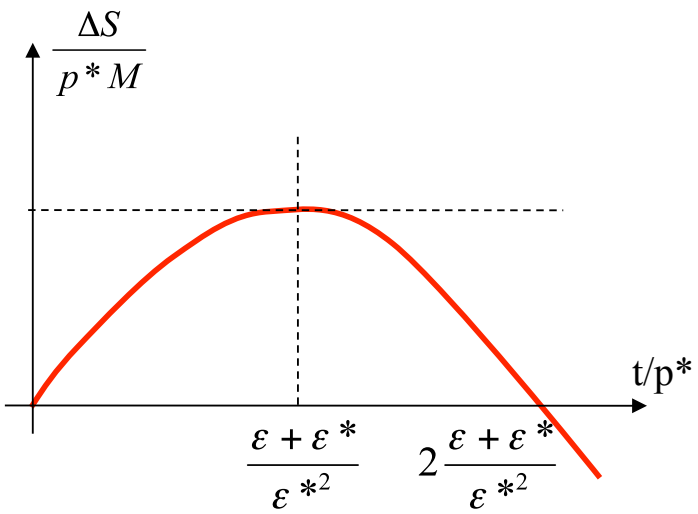
$$\frac{\Delta M}{M} = \varepsilon^* \frac{\Delta p^*}{p^*} \text{ and } \frac{\Delta M}{M} = -\varepsilon \frac{\tau + \Delta p^*}{p^*}$$

- Hence : $\tau = -\frac{\varepsilon+\varepsilon^*}{\varepsilon}\Delta p^*$
- Net surplus variation :

$$\Delta S = \underbrace{-M\Delta p^*}_{e} + \underbrace{\frac{1}{2}\Delta M(\tau + \Delta p^*)}_{-(b+d)}$$

Optimal tariff (2)

Social surplus as a function of tariff in a large country



- Surplus can be expressed as a function of τ :

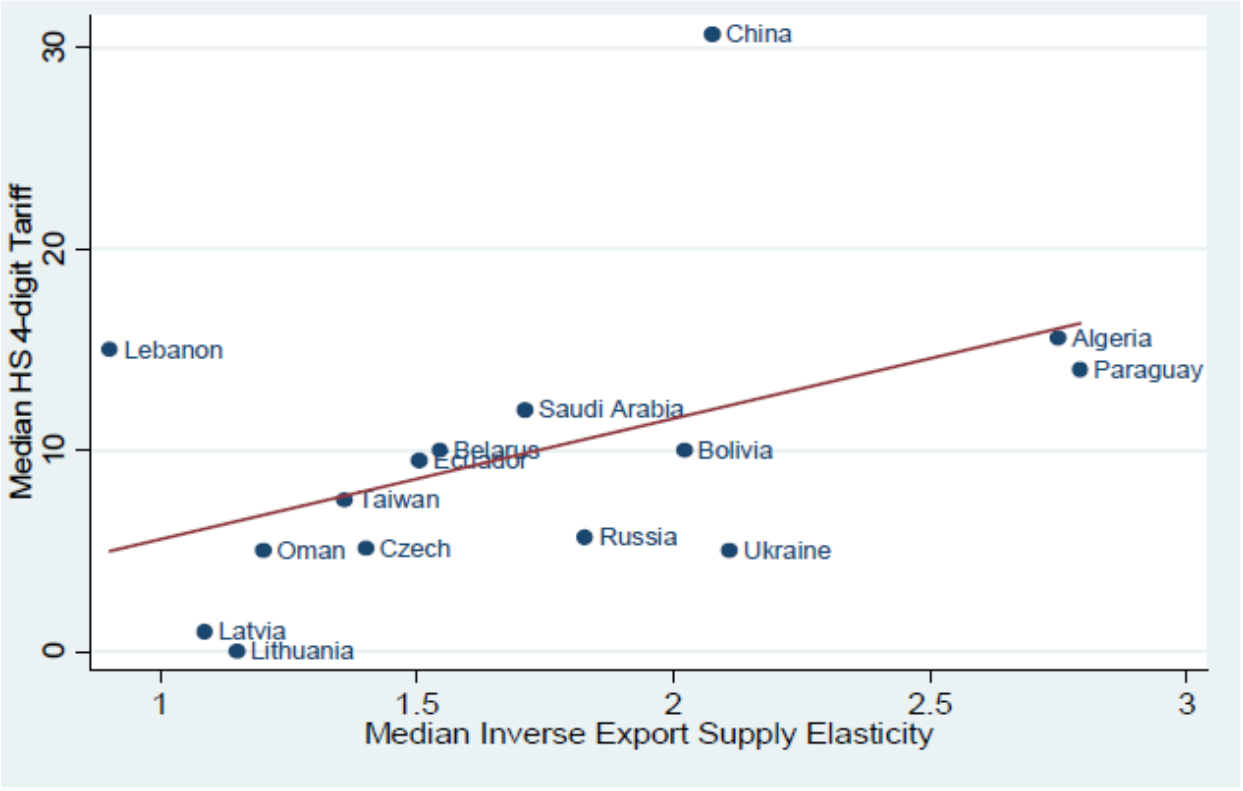
$$\frac{\Delta S}{p^* M} = \frac{\varepsilon}{\varepsilon + \varepsilon^*} \frac{\tau}{p^*} \left[1 - \frac{1}{2} \frac{\varepsilon^{*2}}{\varepsilon + \varepsilon^*} \frac{\tau}{p^*} \right]$$

- Hence : $\frac{\partial \Delta S}{\partial \tau} = 0 \Leftrightarrow \frac{\tau}{p^*} = \frac{\varepsilon + \varepsilon^*}{\varepsilon^{*2}}$
- And : $\Delta S = 0 \Leftrightarrow \frac{\tau}{p^*} = 2\frac{\varepsilon + \varepsilon^*}{\varepsilon^{*2}}$

$\Rightarrow$ **Countries set tariffs in response to their global market power, as measured by** $1/\varepsilon^*$

- Key assumptions : constant elasticities, no pricing to market, no competitor retaliation in response to the tariff

Median tariffs and market power across countries



Source : Broda, Limao and Weinstein, 2008

Multilateral trade negotiations

Overview

- History of trade negotiations
- WTO principles
- The Doha Development Agenda

Trade Wars

Cooperative equilibrium

Country 1 / **Country 2**	Free trade	Tariff
Free trade	**(100,100)**	(-100,200)
Tariff	(200,-100)	**(-50,-50)**

Non-cooperative equilibrium

- Each country can protect its producers by setting tariffs
- Its reaction function depends on its parners' policy
- Game can be modelled as Cournot (price) or Bertrand (quantity) equilibrium
- Risk of prisoner's dilemma where tariffs will be the dominant strategy, with global welfare cost

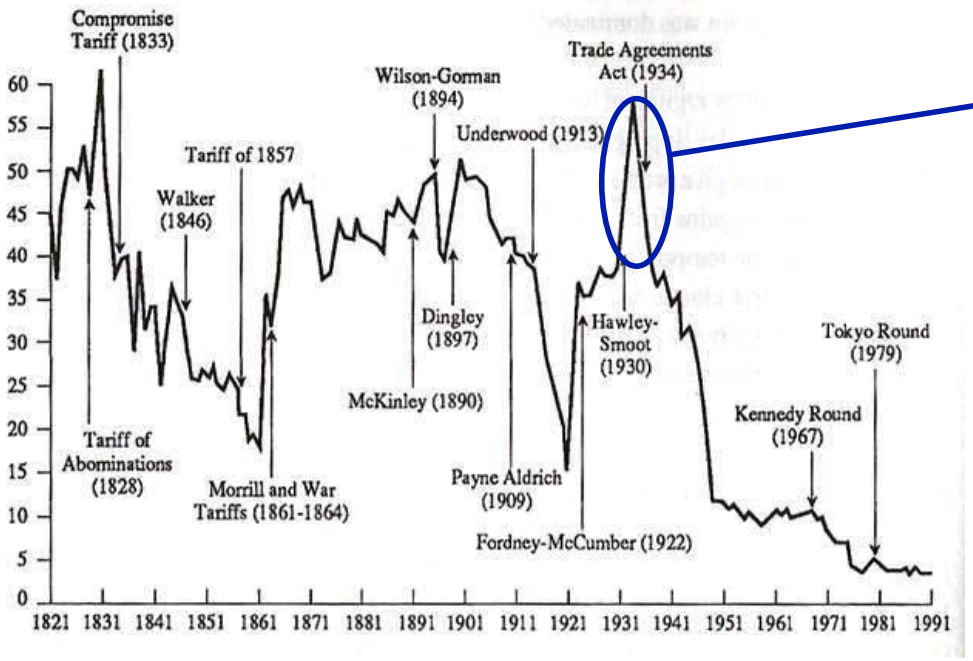
$\Rightarrow$ **Usefulness of trade negotiations**

Two centuries of trade negotiations

- The dispute on free trade : Adam Smith, David Ricardo, Fréderic Bastiat versus Alexander Hamilton, Friedrich List, John Stuart Mill
- **The 19th century** : "Except for Britain, the developed world is an ocean of protectionnism" (P. Bairoch)
  - Britain : abolition of "Corn Laws" (1846)
  - US : McKinley tariffs (1890)
  - Germany : Zollverein (1834)
  - France : free-trade under Louis-Napoléon (Cobden-Chevalier treaty of 1860 with Britain) ; Méline law in 1892 on agricultural tariffs
- Protectionist reaction to the **Great Depression**
  - US : Smooth-Hawley tariffs of June 1930
- **Since 1945** :
  - GATT aim at gradually eliminating trade barriers
  - Regional preference tolerated (ex : EU)
  - US and Europe have opened manufacturing markets and protected their agriculture
  - Developing economies have implemented manufacturing export-led growth strategies (which they are reconsidering only now)

A long-run decline in tariffs

Average import tariff in the US 1820-1990



Source: P. Kenen, *The International Economy*, Cambridge University Press.

1944-1995 : from Havana to Marrakech

- 1944 : **Bretton-Woods conference**
  - IMF, World Bank and ITO are created ; ITO never ratified
- 1948 : **Havana conference**
  - General Agreement on Tariffs and Trade (GATT). 23 countries
- 1947-1979 : Successive **rounds of tariff cuts** : Kennedy Round, Tokyo Round
  - Negotiation takes place between developed countries
  - Increasing importance of non-tariff barriers
- 1986-1994 : **the Uruguay Round**
  - 123 participating countries, wider scope
  - US-EC deal on agriculture (Blair House, 1992)
  - Gradual elimination of textile quotas (Marrakech, 1994) but with safeguard clauses later activated by US and EU
- 1995 : **World Trade Organization (WTO)** is created

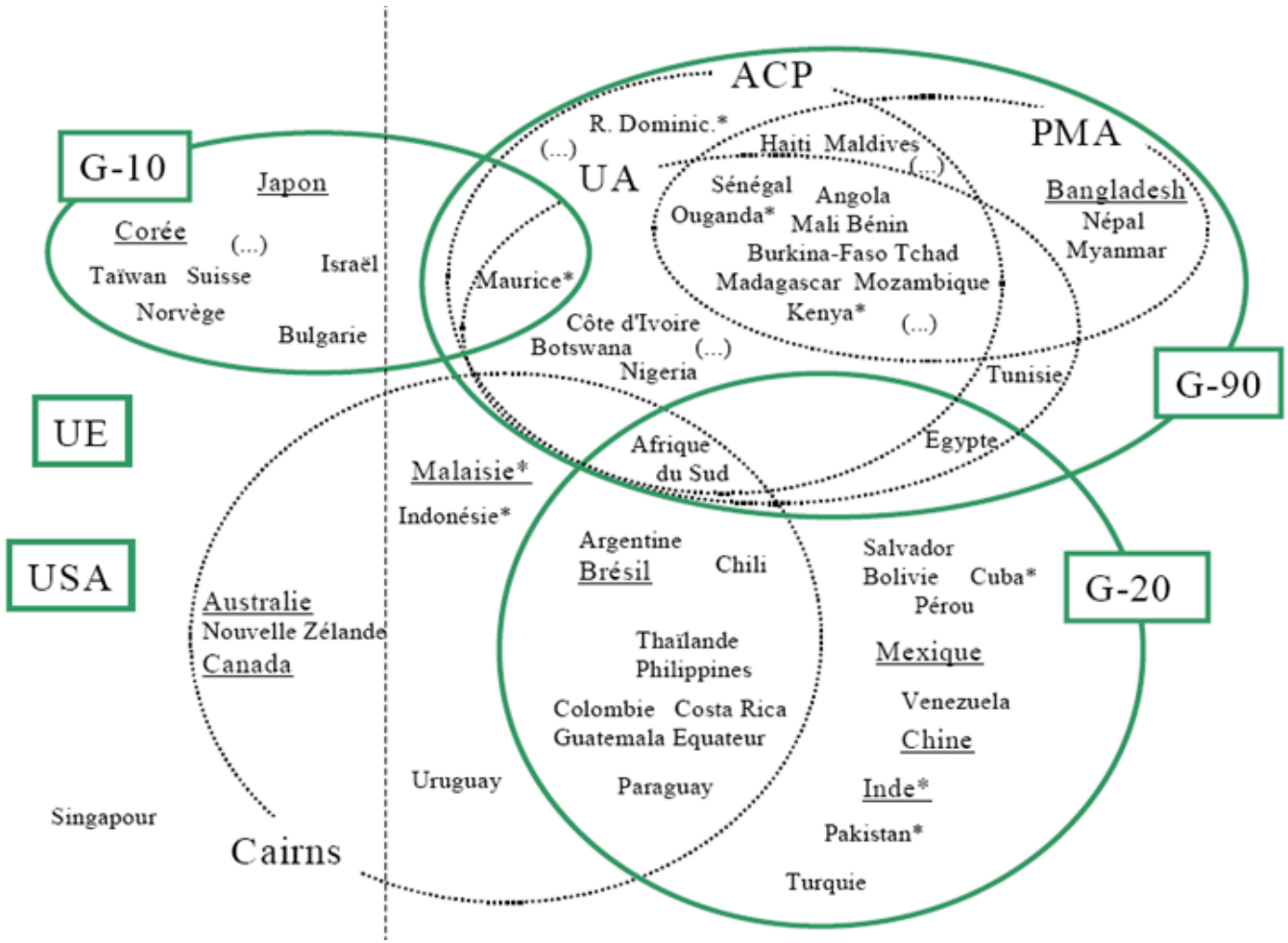
A primer on WTO

- Non-discrimination principle
  - Most Favored Nation (MFN) clause : any decrease of tariff towards a country must be extended to other countries
  - Equal treatment between domestic and foreign products
- Reciprocity objective
  - WTO negotiations are based on reciprocal concessions on tariffs and subsidies, technical norms, intellectual property, etc.
  - Rationale :
    1. Allows for balanced deals
    2. Allows for the emergence of free-trade coalitions within each country - otherwise any trade deals would be vetoed by direct losers

A primer on WTO (2)

- Exceptions
  - Preferential agreements (GATT art.24 : free trade areas or custom unions are allowed provided they do not increase external tariff)
  - Many non-tariff barriers remain (ex : sanitary rules, cultural exception...)
  - As a rule, MFN does not apply to services unless a country has decided so
- Increasing importance of services and intellectual property looking forward
- Existence of a Settlement Dispute Body
  - Expert panel rules, appeal possible
  - Paves the way for targeted sanctions
  - Issue of consistency with other global standards (environment, labor...)

WTO coalitions



Source : Fontagné and Jean, 2003

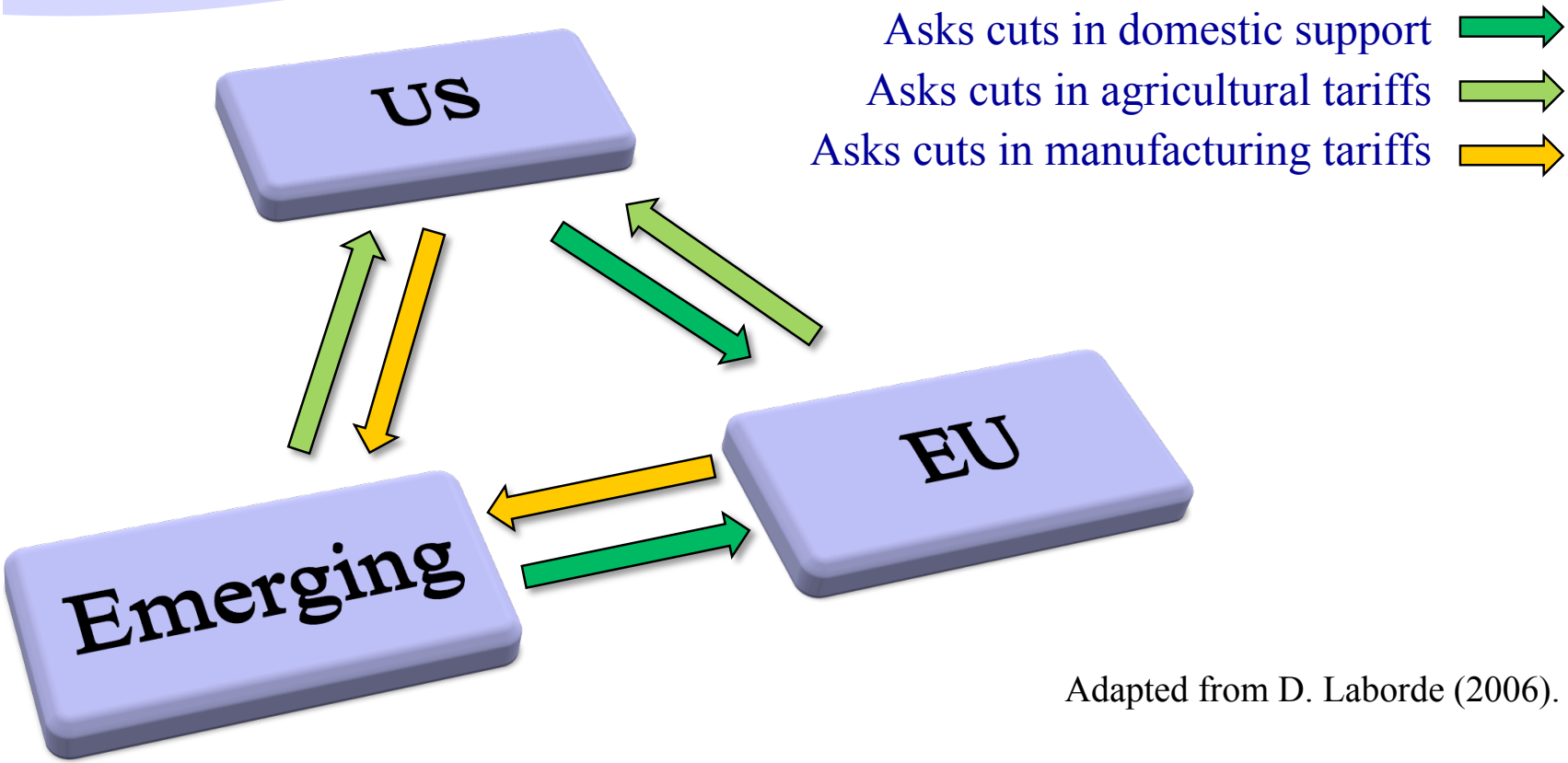
The Doha Development agenda (1)

- **DDA mandate**
  - Agriculture : market access, export subsidies, domestic support
  - Manufacturing ("NAMA")
  - Services (GATS) and intellectual property rights (TRIPS)
  - "Singapore issues" : investment, competition, procurements, environment
  - What is agreed : end of agricultural subsidies in 2013, reduction in tariff peaks for manufactured goods ; need to move forward on services
  - A series of failed ministerial meetings

The Doha Development agenda (2)

- **Cancun (2003), Hong Kong (2005)**
  - Investment, competition and public procurements removed form the table
  - Environment : no progress ; mounting debate on intellectual property rights for green technologies ; French proposal on carbon inclusion scheme
- **Geneva (2008)**
  - Leading role of major emerging economies
  - EU main objective to protect reformed CAP provisions ; EU mildly aggressive on NAMA
  - Negotiation ends with US-India disagreement on agricultural safeguard clause
- **What next ?**
  - Protectionism reasonably well contained so far in spite of crisis (see WTO monitoring)
  - New US administration more aggressive on manufacturing market access, enforcement of safeguard clauses (ex : Chinese tyres)

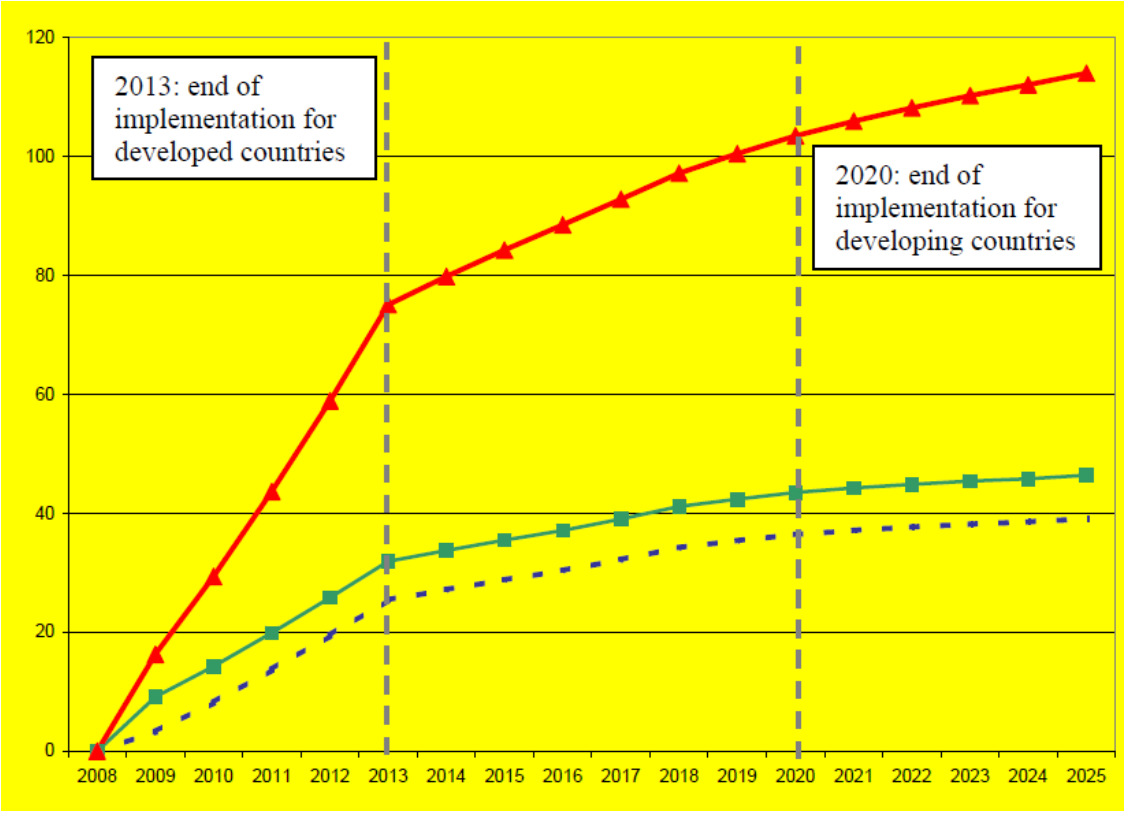
Dynamics of the Doha Round



Adapted from D. Laborde (2006).

General equilibrium impact of DDA

Yearly USD bn gains in GDP, 2008-2025



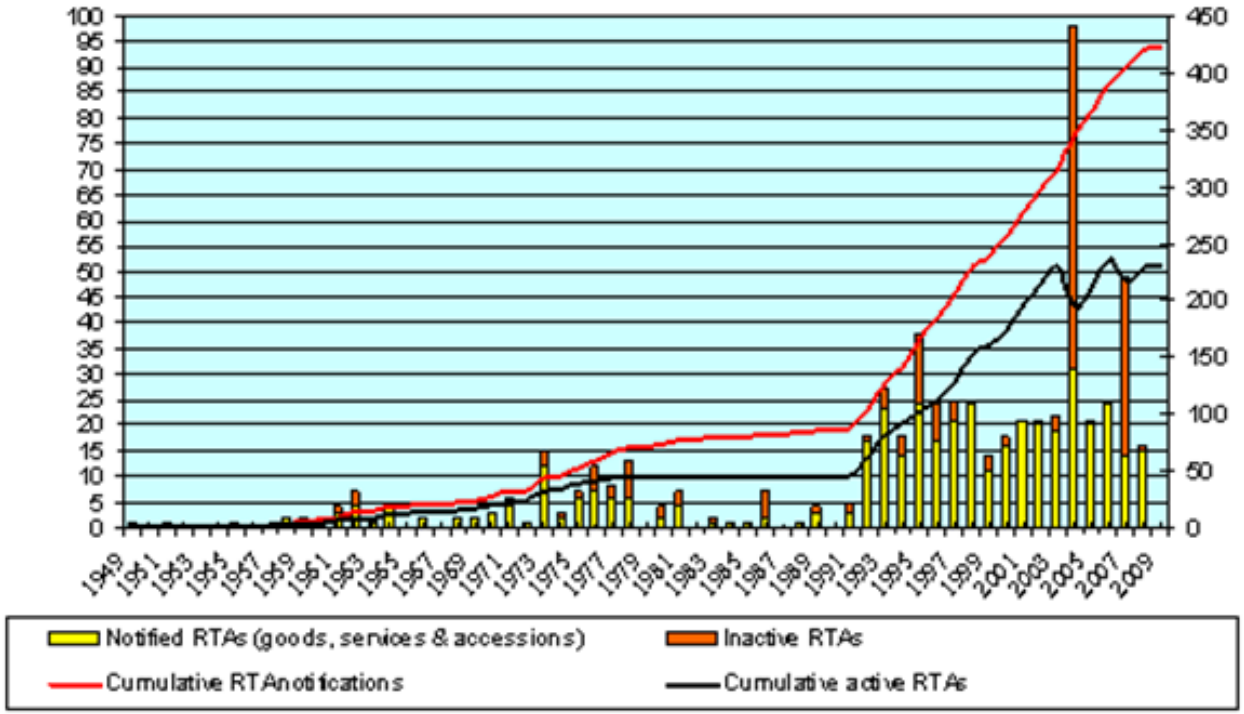
Blue = Agriculture + Manuf., Green = Agriculture + Manuf + Services, Red = Agriculture + Manuf. + Services + Trade Facilitation

Source : Decreux and Fontagné (2009)

Regional Trade Agreements

Evolution over time

Number of regional trade agreements

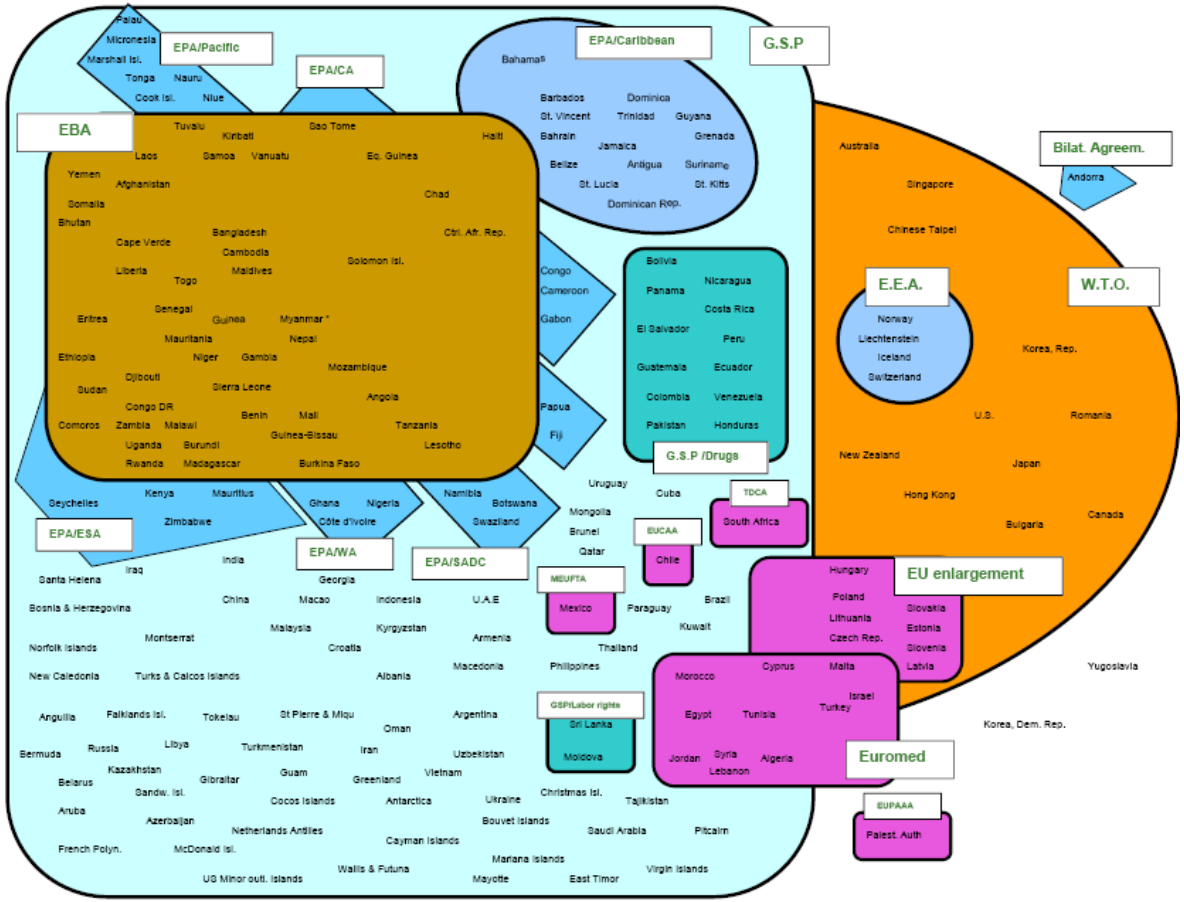


Source : WTO Secretariat

Trade regionalism

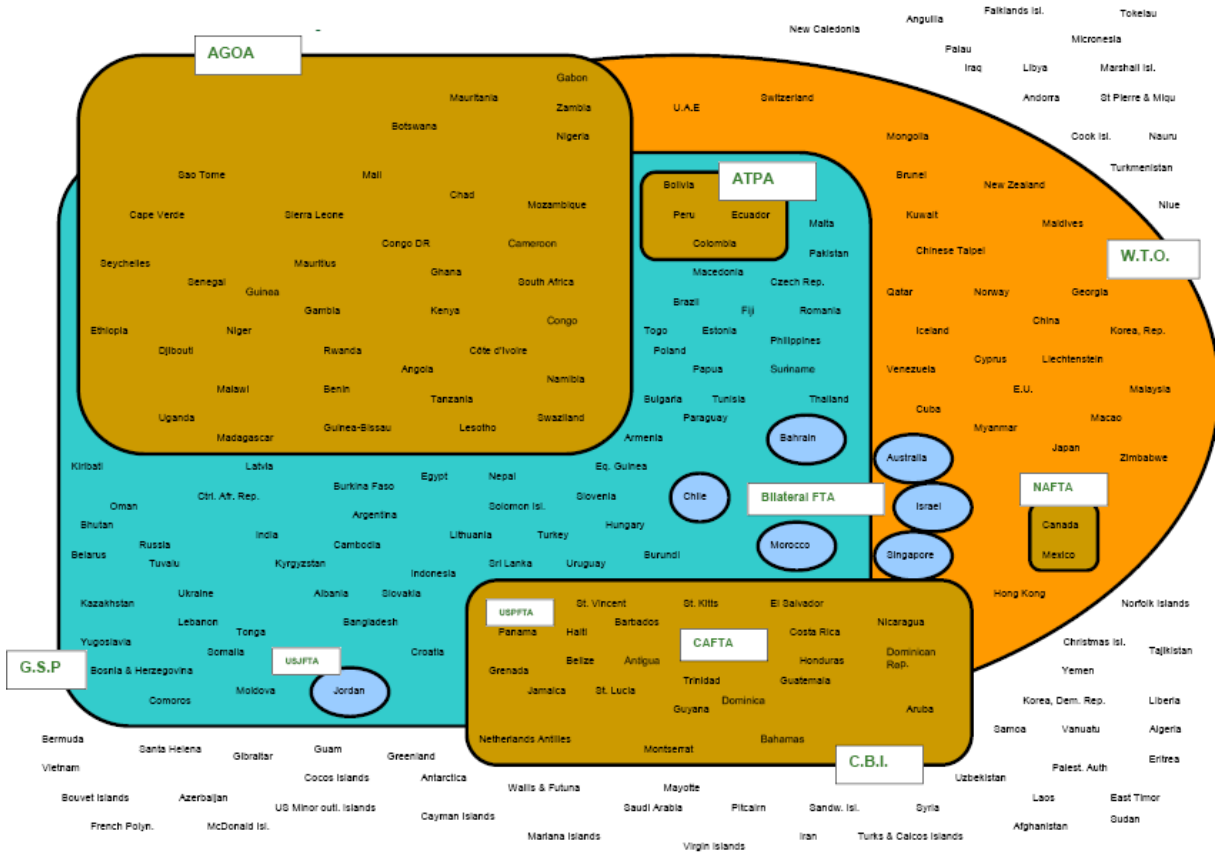
- **Definitions**
  - **Free trade area** : intra-area tariff set to zero. no single external tariff. Requires rules of origin. Ex : NAFTA (US, Canada, Mexico)
  - **Custom union** : FTA + single external tariff. Ex : pre-Single Act EC ; CARICOM (Caribbean Community)
  - **Common market** : custom union + free movements of labour and capital. Ex : EU
- **Impact of a custom union on trade** (Viner, 1950)
  - Trade creation
    - Lifting tariff barriers allows cheaper products to be imported from within union
    - Valid if prices are cheaper in partner countries than in the rest of the world
  - Trade diversion
    - Lifting trade barriers within the union discourages trade with rest of the world
    - Valid if prices are higher in partner countries than in rest of the world
- **Favourable environment for a custom union** :
  - Price discrepancies among member countries ; high initial protection ; high intra-regional trade ; opportunity to set a low external tariff

EU Trade agreements in 2004



Source Bouet et al, 2004

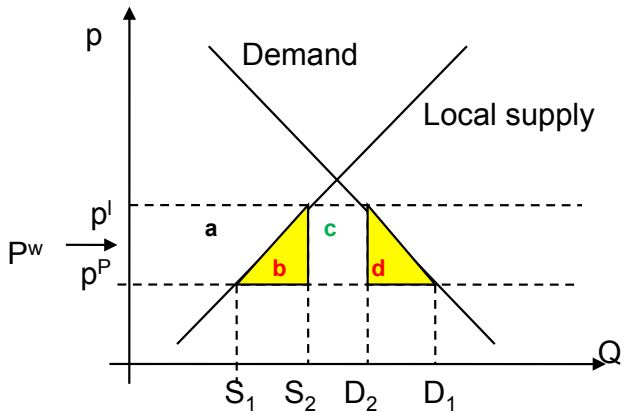
US Trade agreements in 2004



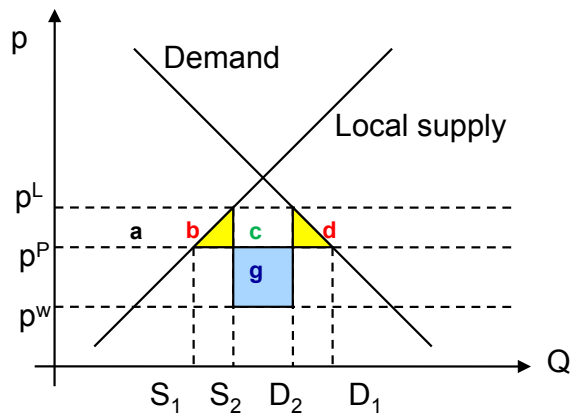
Source Bouet et al, 2004

Welfare impact of a custom union

Trade Creation



Trade Diversion



- **Assumptions**
  - Small country, perfect competition, partial equilibrium
  - Three countries : (L) Local, (P) Partner and (W) Rest of the World
  - p^P export price in (P), p^W export price in (W)
- **Trade creation**
  - Partner price less than world price ($p^P < p^W$)
  - Before custom union, import price is : $p^L = p^P + \tau$
  - Union increases welfare by $(b + d)$
- **Trade diversion**
  - Partner price higher than world price ($p^P > p^W$)
  - Before custom union, import price is : $p^L = p^W + \tau$
  - After union, price becomes p^P
  - Union increases welfare by $(b + d) - g$, which may be positive or negative
- **Custom union is beneficial if import demand is very elastic to price, i.e. if $(b + d)$ is large**
  - This would be even truer if firms were in monopolistic competition, since they would then benefit from a larger market

"Multilateral or bilateral trade agreements : which way to go ?"

Pascal Lamy, Director-General of WTO, 17/1/2007

"Attractiveness of regional trade agreements

In my view, there are several reasons for the attractiveness of bilateral agreements as compared to multilateral negotiations.

- First, they seem **quicker to conclude**. Fewer parties means that preferential trade agreements can be wrapped-up within a shorter period of time. This is usually very attractive to both politicians and business communities who are looking for quick results.
- Secondly, they can **enter into new territories**. Because of similarities in interests and often more common values, bilateral trade agreements can go into new areas such as investment, competition, technical standards, labour standards or environment provisions, where there is no consensus among WTO Members.
- Thirdly, **many of the recent FTAs contain political or geopolitical considerations**. For developing countries negotiating with more powerful developed countries, there is usually the expectation of exclusive preferential benefits, as well as expectations of development assistance and other non-trade rewards. They are also viewed as an instrument to get 'brownie points' and gain an advantage over other WTO Members.
- Bilateral trade agreements are also **useful for negotiators to learn how to negotiate** thus contributing to reinforcing a country's trade institutions. Many regional trade agreements have been the bedrock for peace and greater political stability. Finally, they are often used as instruments for domestic reform in areas where the multilateral system offers a weaker leverage.

Why bilateral trade agreements cannot replace multilateral rules

But in my view **bilateral agreements cannot replace the multilateral trade rules**. Putting aside what we were told by trade theory textbooks: for instance that they create trade diversion and shift imports from most efficient global suppliers, I would like to emphasize four crucial limitations of bilateral agreements.

- **First**, the conclusion of preferential trade agreements can **create an incentive for even further discrimination**, which eventually will hurt all trading partners. Countries outside an agreement will try to conclude agreements with one of those that are inside to avoid exclusion. This has been called the "domino" or "bandwagon effect" and is the reason for much of the regional trade agreement activity seen in Asia recently. In other words, the consequence is that the preferences obtained through forming a preferential agreement against competitors tend to be short-lived. The more agreements you have, the less meaningful the preferences would be.
- **Secondly**, bilateral agreements **cannot solve systemic issues such as rules of origin, antidumping, agricultural and fisheries subsidies**. These issues simply cannot be handled at the bilateral level. Take for instance, negotiations to eliminate or reduce trade distorting agricultural subsidies, or fisheries subsidies. There is no such thing as a "bilateral" farmer or fisherman, or a "bilateral" chicken and a "multilateral" farmer or chicken or fish. Subsidies are given to farmers for all their poultry production. The same is true for rules on anti-dumping.
- **Thirdly**, the proliferation of regional trade agreements can greatly **complicate the trading environment, creating a web of incoherent rules**. Take rules of origin: an increasing number of WTO Members are party to ten or more regional trade agreements, most of which for a given Member, contain agreement-specific rules of origin which are necessary to ensure that the preferences go to your partner and not to others. This complicates the production processes of business who may be obliged to tailor their products for different preferential markets in order to satisfy rules of origin. It also complicates life for customs officials who are obliged to assess the same product differently depending on its origin, thus compromising the transparency of the trading regime. Borrowing the expression used by Professor Bhagwati — this is where we begin to have a real "spaghetti bowl" of twisted rules of origin.
- **Finally**, to many small and weak developing countries, entering into a bilateral agreement with a powerful big country means **less leverage and a weaker negotiating position** as compared that in the multilateral talks. It might not be the case for India, China, Brazil, the US and the EC, it will be true for Mauritius, Sri Lanka, Cambodia or Ghana."

The Political Economy of Trade Protection

Overview

- Trade protection through tariffs, export subsidies or quotas generates a rent for producers and a welfare loss for consumers
- Producers are ready to pay to secure such protection through communication, lobbying, sometimes corruption
- J. Bhagwati (1989) has studied the political economy of protection in developing countries :
  1. 'Upstream' expenses to establish and maintain trade barriers, e.g. to lobby politicians
  2. 'Downstream' expense in response to existing distortions, e.g. to bribe custom officers
  3. The market for protection is not perfectly competitive (e.g. some firms have better access to government) and firms' expenses do not offset the whole of surplus *a*
- Modern models of the demand for protection build upon median voter approach or on game theory

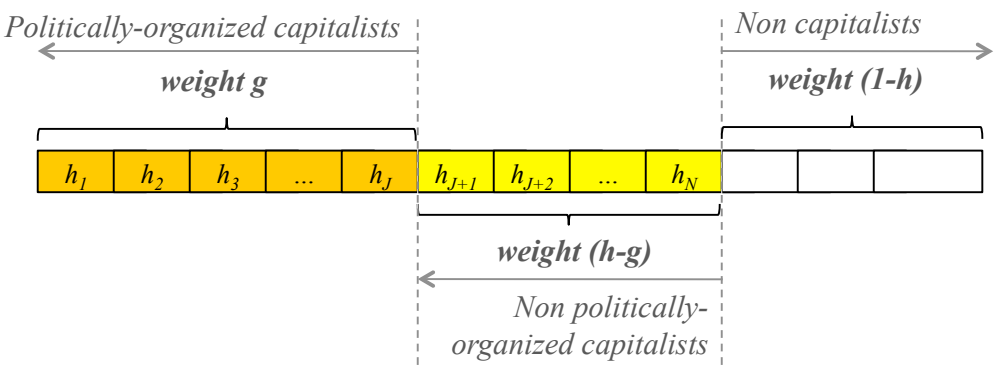
Protection for sale

Adapted from G. Grossman and E. Helpman (1994), "Protection for Sale," *American Economic Review*

- Game between domestic producers who lobby through contributions, and politicians who set tariffs and subsidies
- Continuum of households indexed by $\omega \in [0, 1]$
- $N + 1$ goods :
  - Numeraire good $i = 0$ is produced one-to-one from labor L (therefore wage $= 1$)
  - N identical manufactured goods with prices $\{p_1, ..., p^N\}$, each produced out of labor L_i and sector-specific capital K_i
- Small country (world prices p_i^* exogenous)
- Government sets specific tariffs $\tau_i > 0$ such that $p_i = p_i^* + \tau_i$: If good is exported, then τ_i is an export subsidy
- Trade policy is described by tariff vector $\tau = \{\tau_1, ...\tau_N\}$; tariff revenue $T = \sum_i \tau_i M_i$ is given back to households

Political structure

- A fraction of the population with weight h_i owns capital K_i needed to produce good i. $h = \sum_i h_i$ is the fraction of the population which owns capital.
- Industries $i = 1, ...J$ with $J < N$ are "politically organized" as lobbies
- $g = \sum_{i=1}^{J} h_i$ is the fraction of population which is politically represented.



Contributions to total surplus

- Return to capital K_i is π_i with : $\pi_i(p_i) = max_{L_i} p_i y_i - L_i$ with $p_i = p_i^* + \tau_i$
- Individual consumer surplus is : $S(p_i) = \sum_{i=1}^{N} [u(d(p_i)) - p_i d(p_i)]$ where d is the implied demand for good i : $d(p_i) = u'^{-1}(p_i)$
- Surplus of lobby i :

$$W_i = \underbrace{\pi_i}_{Capital} + h_i[\underbrace{1}_{Labor} + \underbrace{S}_{Consumer\ surplus} + \underbrace{T}_{Tariff\ revenue}]$$

Surplus of non-capitalists : $W^{NC} = 1 - h + (1-h)S + (1-h)T$
Total surplus : $W = 1 + \sum_i \pi_i + S + \sum_j \tau_j M_j$
Lobbies' total surplus : $W^L = \sum_{i=1}^{J} \pi_i + g(1 + S + T)$

Solving the model

- We focus on a **Nash-bargaining solution** : joint objective Ω is a weighted combination of total surplus W and lobbies' surplus W^L

$$\begin{aligned} Max\ \Omega &= \beta W + (1-\beta) W^L \\ &= \beta \left[1 + \sum_i \pi_i + S + T \right] + (1-\beta) \left[\sum_{i=1}^{J} \pi_i + g(1+S+T) \right] \end{aligned}$$

- **First-order condition** :

$$\begin{aligned} 0 &= \partial\Omega/\partial\tau_i = [\beta + (1-\beta)\delta_i]\, \partial\pi_i/\partial p_i \\ &\quad + [\beta + (1-\beta)g]\, [\partial S/\partial p_i + M_i + \tau_i \partial M_i/\partial\tau_i] \end{aligned}$$

where $\delta_i = 1$ if $i \leq J$ (politically-organized industry) and 0 otherwise

- Using $\partial\pi_i/\partial p_i = y_i$ and $\partial S/\partial p_i = -d_i$:

$$[\beta + (1-\beta)\delta_i]\, y_i + [\beta + (1-\beta)g]\, [-d_i + M_i + \tau_i \partial M_i/\partial p_i] = 0$$

Optimal trade policy

- Hence the **(ad-valorem) tariff** :

$$\frac{\tau_i}{p_i} = \frac{(1-\beta)(\delta_i - g)}{\beta + (1-\beta)g} \frac{1}{\varepsilon_i} \frac{y_i}{M_i}$$

where $\varepsilon_i = \left| \frac{\partial M_i / M_i}{\partial p_i / p_i} \right|$ is the price elasticity of imports
and δ_i=1 if the industry is politically-organized and 0 otherwise

$\Rightarrow$ Positive if the industry is organized, negative otherwise (import subsidy)

$\Rightarrow$ Tariff increases with domestic production

$\Rightarrow$ Sectors with high price elasticity should receive less protection (protection is more distortive)

Optimal trade policy (2)

$\Rightarrow$ Free trade is optimal in two special cases : i) Government ignores lobbies ($\beta = 1$), ii) All industries are organized ($\delta_i = 1 \forall i$) and all citizens are capitalists ($g = 1$), in which case surplus of lobbies = social welfare

$\Rightarrow$ If politically-organized sector is very concentrated ($g \approx 0$), there are "tariff peaks" in this sector

Econometric studies of correlation between tariffs and political contributions by lobbies have validated the model