Distortions and Government Policies as Determinants of Trade, unotes6

Motivation:

1. So far, we have considered the effects of trade on countries with "perfect" markets. Prices accurately reflect the cost of resources needed to produce goods, and the value that consumers place on goods.

2. But governments have many policies that distort prices, often with necessity and the best of intentions. For example, governments need to raise tax revenue in order to pay for public goods.

3. How does trade affect the environment in a distorted environment? Agents are making decisions based on distorted prices.

4. In other cases, governments deliberately distort the economy in order to achieve some objective, such as shifting resources to a politically favored sector (e.g., high tech).

5. What are the consequences of a government deliberately distorting the economy to achieve a trade objective, such as the export of high tech products?

1. Distinguishing among producer, consumer, and world prices.

2. Autarky equilibrium, where does tax revenue go?

3. Small economy, fixed world prices: distortions as a basis for (bad) trade.

4. Two identical economies

5. Production externalities

Autarky p - producer prices, q - consumer prices

(1)
$$q = p(1 + t) > p \qquad tax$$
$$q = p(1 - s) < p \qquad subsidy$$

Note the equivalence of a tax on one good and a subsidy on the other.

$$\frac{q_1}{q_2} = \frac{p_1(1+t)}{p_2} > \frac{p_1}{p_2} \qquad tax\ on\ X_1$$

$$\frac{q_1}{q_2} = \frac{p_1}{p_2(1-s)} > \frac{p_1}{p_2} \qquad subsidy\ on\ X_2 \tag{10.2}$$

In the closed (autarky) economy, there is no different between a tax on the producer and a tax on the consumer

Figure 10.1

Notice welfare loss: decisions based on distorted price signals.

Figure 10.1

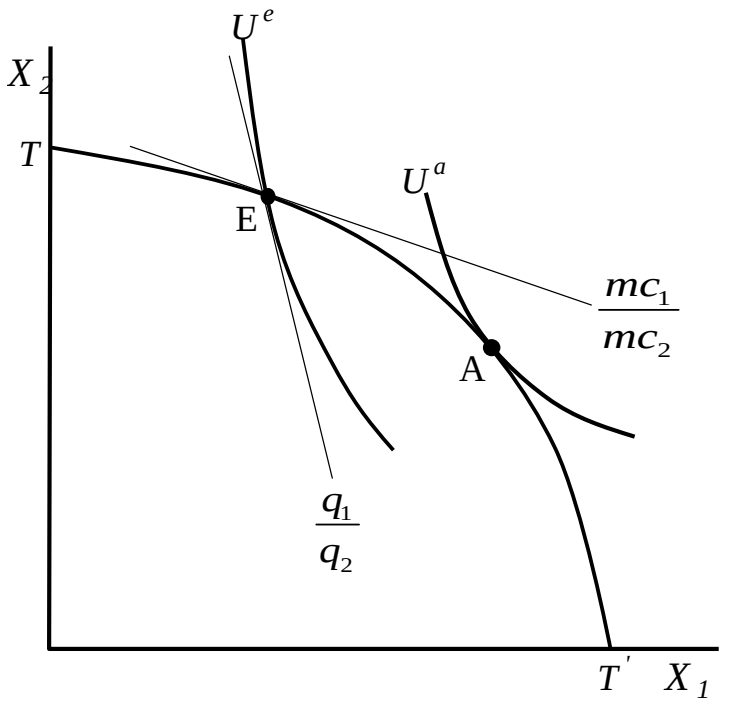
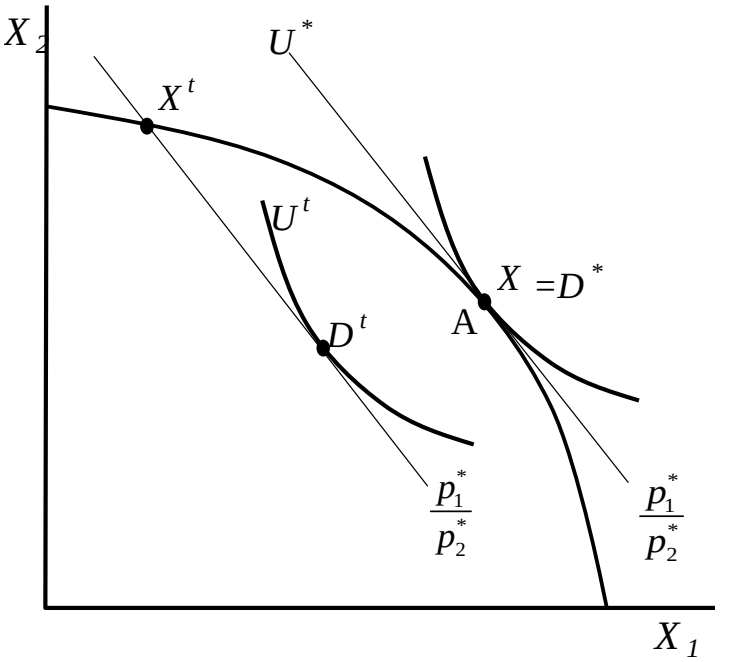


Figure 10.2



In the open economy, there is a great difference between taxing consumption of a good versus taxing production.

Taxing consumption leads to a reduction in consumption, encouraging exports.

Taxing production leads to a reduction in production, encouraging imports.

Assume throughout that tax revenues are redistributed back to consumers lump sum.

Then the value of consumption at consumer prices, equals the value of production at producer prices plus (net) tax revenue.

$$q_1 D_1 + q_2 D_2 = p_1(1+t)X_1 + p_2 X_2 = \left[p_1 X_1 + p_2 X_2\right] + \left[p_1 t X_1\right] \quad (10.3)$$

Small Economy: fixed world prices = undistorted domestic autarky prices.

Production Tax on X_1 (subsidy on X_2) (Figure 10.2)

$$\frac{p_1(1+t)}{p_2} = \frac{q_1}{q_2} = \frac{p_1^*}{p_2^*} > \frac{p_1}{p_2} \qquad (10.4)$$

Equilibrium requires:

(1) Trade balances at *world* prices, implying that the consumption and production points are connected by the world price ratio.

(2) Producer prices do *not* equal world prices, implying that the world price ratio cuts the production frontier.

(3) Consumers optimize with respect to the *consumer* price ratio, so that the slope of an indifference curve is equal to the consumer price ratio = world price ratio.

Result: Bad trade. A subsidy can generate exports, but do not confuse exports with welfare.

“If it ain’t broke, don’t fix it”.

Two identical countries: identical autarky = free trade equilibria at A in Figure 10.3

Let country h put a subsidy on X_2. This will shift production in h from X_1 to X_2.

At the old prices, excess supply of X_2 and excess demand for X_1.

(Passive) country f will be drawn into specializing in and exporting X_1.

Figure 10.3: passive country f gains from trade - silly country h is selling X_2 for less than the cost of production.

Figure 10.3

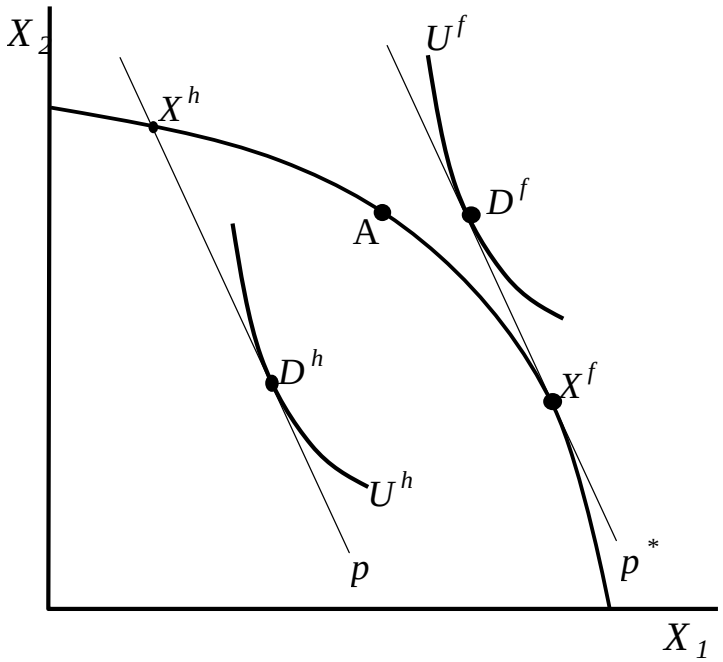
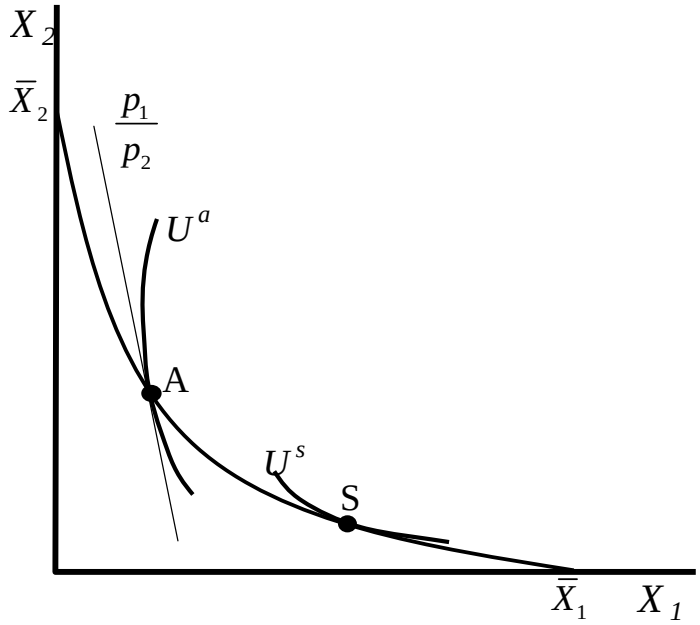


Figure 10.4



Production externalities

Suppose that there are positive "spillovers" among firms in sector 1.

(a) anything learned by one firm can be costlessly copied by all. Firms creating new knowledge/techniques cannot control or charge for this

(b) a large market leads to the creation of specialized intermediate inputs that raise the productivity of all firms. Each firm takes the range of intermediates as fixed (exogenous to its own decisions).

Each firm's output depends on the total output of the sector, which is taken as exogenous.

$$X_{i1} = (X_1^{\alpha})L_{i1} \qquad X_2 = L_2 \qquad \bar{L} = \sum_i L_{i1} + L_2 \tag{10.5}$$

where $0 \leq \alpha < 1$ is an externality parameter: $\alpha = 0$ is the special case of no externality, in which case the model reduces to the Ricardian model of Chapter 7.

In competitive equilibrium, each firm equate the value of the marginal product of labor to the wage rate, denoted *w*, as in the Ricardian model.

$$p_1 X_1^{\alpha} = w \qquad p_2 = w \qquad \frac{p_1}{p_2} = \frac{1}{X_1^{\alpha}} \tag{10.6}$$

Total industry output in X_1 is given by summing the first equation in (10.5) over all i firms. Total industry output X_1 is as follows.

$$\sum_i X_{i1} = X_1 = X_1^{\alpha} \sum_i L_{i1} = X_1^{\alpha} L_1 \qquad X_1^{1-\alpha} = L_1 \qquad X_1 = L_1^{\frac{1}{1-\alpha}} \tag{10.7}$$

Since $\alpha < 1$, the exponent on the right-hand equation of (10.7) is greater than one: total industry output exhibits increasing returns to scale in its total labor input.

Differentiate the middle equation in (10.7) along with the equation for X_2 output, making use of the total labor supply constraint.

$$(1-\alpha)X_1^{-\alpha}dX_1 = dL_1 \qquad dX_2 = dL_2 = -dL_1 \tag{10.8}$$

Divide the first equation of (10.8) by the second and rearrange.

$$-\frac{dX_2}{dX_1} = (1-\alpha)\frac{1}{X_1^{\alpha}} \tag{10.9}$$

which is the slope of the production frontier, the marginal rate of transformation. The production frontier is a convex function: IRS

Figure 10.4

Now combine (10.9) with the competitive pricing condition in (10.6). This gives us a relationship between the marginal rate of transformation and the equilibrium price ratio.

$$-\frac{dX_2}{dX_1} = (1-\alpha)\frac{p_1}{p_2} < \frac{p_1}{p_2} \qquad (10.10)$$

There is also a distortion between the MRT and the price ratio. Let's ignore this for now.

Consider two identical economies as shown in Figure 10.5. Significant gains from trade exist through specialization.

But, this is not the only possibility: there is no reason that equilibrium prices just happen to equal the cord connecting the endpoints of the ppf.

Figure 10.6 shows an outcome in which the gains are very asymmetric despite being identical countries.

There are *multiple equilibria*: just reverse the labeling of the countries in Figure 10.6. This plus the unequal gains creates a role for government policy.

Figure 10.5

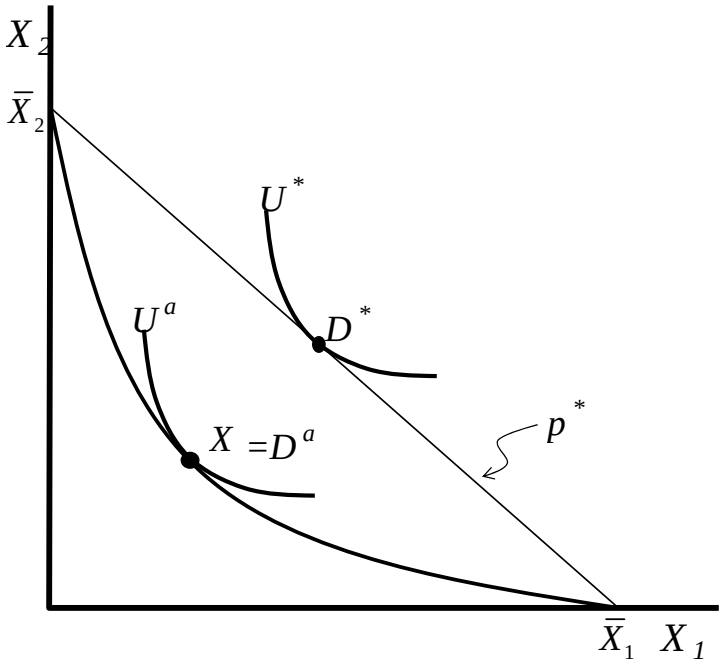
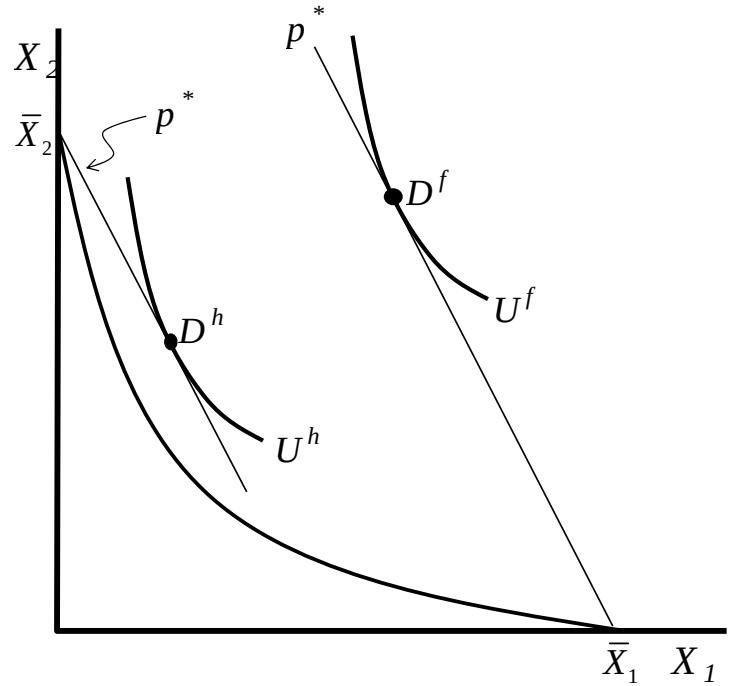


Figure 10.6

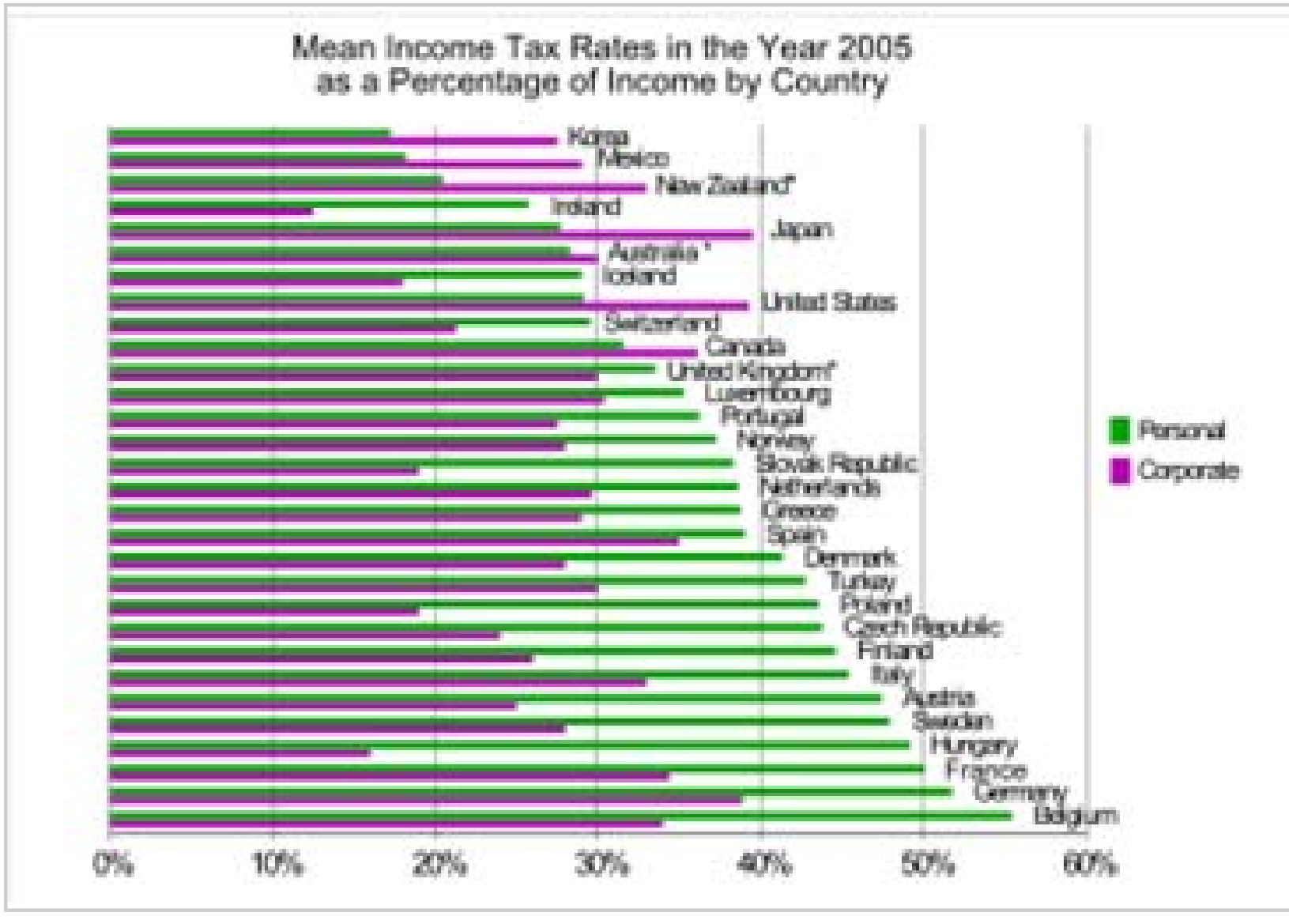


1. Public policy can generate trade, but it is not necessarily good trade and must be welfare worsening if everything is optimal to start with (if it ain't ....). *Exports must not be confused with welfare*.

2. There is a symmetry between a tax in one sector and a subsidy to the other sector. Why are governments so paranoid about foreign subsidies but not about foreign taxes?

3. Production externalities are thought to be common. They can lead to gains from trade between similar countries, though:
   (a) there may exist multiple equilibria
   (b) similar countries do not benefit equally
   (c) these two together create a possible role for government policy

Graphs



Income Tax rates by Country based on OECD 2005 data.
[2]

e's take

ist print edition

s differ dramatically in how they tax—and how much they raise

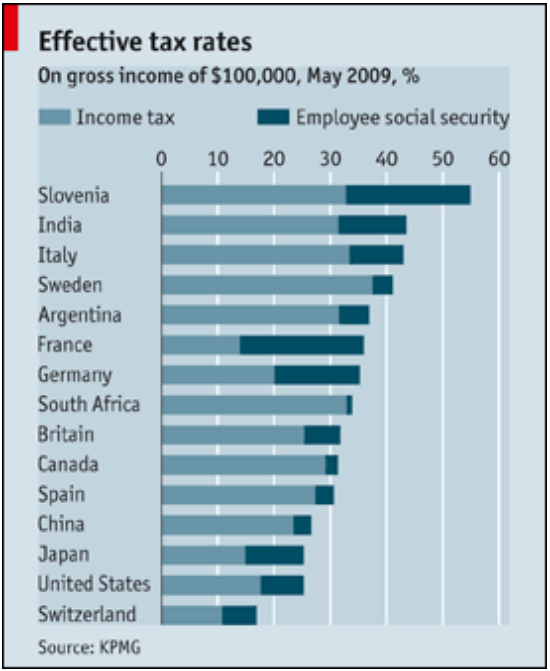
On top of the world

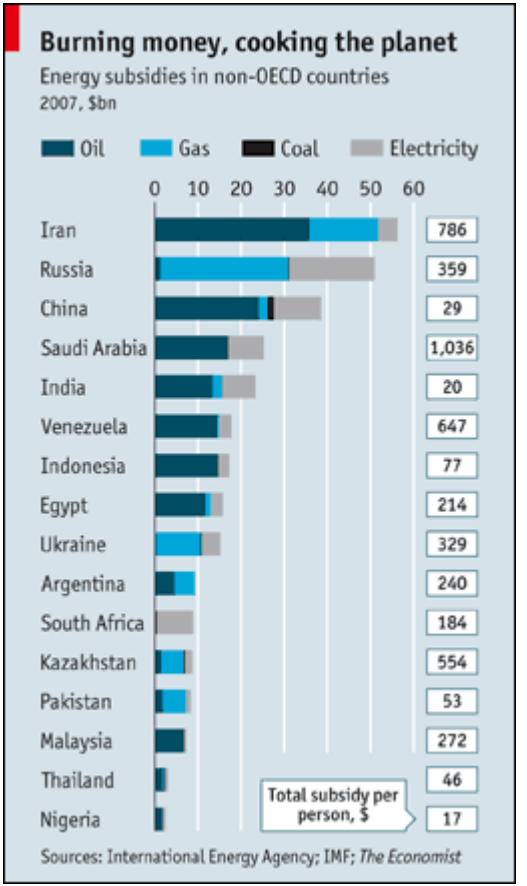
Government taxation, 2007

	Advanced economies									BRICs			
	Australia	Britain	Canada	France	Germany	Italy	Japan*	South Korea	United States	Brazil	China*	India	Russia
Total revenue†, % GDP	35.9	41.8	41.4	49.6	43.8	46.4	34.5	33.6	33.7	34.8	18.1	22.3	47.7
Total tax, % GDP	29.5	37.7	34.8	44.7	40.4	43.0	28.2	28.7	28.0	32.3	16.4	18.9	33.2
Total tax, $bn§	268.5	1,055.6	496.7	1,161.2	1,344.6	910.5	1,230.2	301.1	3,941.7	430.7	435.9	207.8	429.7
Structure, % of total tax													
Income and capital**	59.2	37.8	49.9	23.4	30.9	34.2	35.4	37.6‡	48.3	32.3‡	28.4‡	47.7‡	26.0
people	*37.5*	*28.7*	*36.2*	*16.7*	*23.5*	*26.7*	*18.5*	*19.6‡*	*37.5*	*na*	*7.4‡*	*17.1‡*	*na*
companies	*21.2*	*9.1*	*12.4*	*6.6*	*3.4*	*7.5*	*17.0*	*17.9‡*	*10.8*	*na*	*21.0‡*	*30.7‡*	*na*
Employment	4.5	nil	1.9	2.7	nil	nil	nil	nil‡	nil	6.0‡	nil‡	nil‡	9.5
Property	9.1	12.0	9.7	10.2	2.1	1.9	9.1	4.4‡	10.9	0.1‡	0.9‡	0.1‡	nil
Goods and services**	25.4	28.1	22.4	24.1	26.2	28.7	18.6	30.3‡	15.6	25.3‡	64.9‡	34.1‡	24.2
consumption	*13.2*	*17.0*	*13.7*	*15.7*	*17.0*	*14.1*	*9.2*	*20.7‡*	*7.6*	*na*	*49.0‡*	*0.2‡*	*na*
excise	*7.4*	*8.5*	*4.4*	*4.5*	*6.5*	*4.8*	*7.4*	*9.6‡*	*3.5*	*na*	*15.3‡*	*23.8‡*	*na*
Other	1.8	nil	1.0	nil	nil	4.4	nil	9.4‡	0.7	11.5‡	5.8‡	18.0‡	22.0
Social contributions	nil	22.0	15.0	40.2	40.8	30.8	36.6	18.3‡	24.5	24.9‡	nil‡	0.2‡	18.3

Sources: CEIC; IMF; OECD; National statistics offices

*2006 data †Taxation plus other government income ‡At market prices **Sub-categories are not exhaustive ‡Central government only


Effective tax rates
On gross income of $100,000, May 2009, %
Income tax
Employee social security
0
10
20
30
40
50
60
Slovenia
India
Italy
Sweden
Argentina
France
Germany
South Africa
Britain
Canada
Spain
China
Japan
United States
Switzerland
Source: KPMG



Subsidising fossil fuels has many flaws. If imported, they may increase a country's energy dependence on risky outside supplies. In big oil-producing countries, such as Iran (which is not a G20 member) and Saudi Arabia (which is), subsidies are especially high. They drain public coffers and encourage wasteful domestic consumption, using petrol that could be better sold for export.

Rich countries subsidise fossil fuels too, but by much less—the OECD estimates around $20 billion-$30 billion annually. A new report by the Environmental Law Institute, a think-tank, says that America spent $72 billion on fossil-fuel subsidies from 2002 to 2008. But these are production subsidies. American oil companies earn a tax credit at home for royalties (of up to 85% in some cases) paid on oil extracted abroad. The provision is intended for companies to avoid double taxation, but acts as a windfall for the oil industry. Other subsidies, such as paying for poor families' heating oil, are more defensible. But the G20 agreed that all subsidies that encourage wasteful consumption must go.