

Lecture for 9/11/2008

PK

Why is international macro different from macro-macro?

1. Multiple monies
2. Relative prices play a key role
3. Spending not equal to income for any one country
4. ????

Anyway, all these things interrelated; have to break in somewhere

So we'll start with relative prices and trade flows

Partial equilibrium analysis of trade flows

$$X = X(Y^*, EP^*/P)$$

$$M = M(Y, EP^*/P)$$

Where

X, M = volumes of exports, imports

E = exchange rate (domestic currency/foreign)

P, P^* = goods prices Home and Foreign

Y, Y^* = GDPs Home and Foreign

Thoughts:

1. This looks primitive – where's the general equilibrium? Where's the *macro*?
2. But why shouldn't you use partial equilibrium to look at exports and imports?
3. Elasticities estimated from this approach play a big role in more sophisticated modeling

Typical starting point:

1. Each country's export price is fixed in its own currency; let $P=P^*=1$
2. The *same* relative price is relevant to imports and exports
3. Y, Y^* taken as given

Marshall-Lerner:

Trade balance: $T = X - EM$ (why? Prices normalized to 1)

$dT = dX - EdM - MdE$ (last term is valuation effect)

$$= X \cdot (dX/X) - ME \cdot (dM/M) - ME \cdot (dE/E)$$

Now, a 1% depreciation lowers relative price of exports by 1%, raises price of imports by 1%; so ...

$$dX/X = \epsilon_X \cdot (dE/E)$$

$$dM/M = -\epsilon_M \cdot (dE/E)$$

So

$$dT = X \epsilon_X \cdot (dE/E) + ME (\epsilon_M - 1) \cdot (dE/E)$$

If we start from balanced trade, $X=EM$,

$$dT = X (\epsilon_X + \epsilon_M - 1)$$

TABLE 1
Long-Run Elasticities

	Income		Price	
	Exports	Imports	Exports	Imports
Canada	1.1*	1.4*	-0.9*	-0.9*
France	1.5*	1.6*	-0.2	-0.4*
Germany	1.4*	1.5*	-0.3	-0.06*
Italy	1.6*	1.4*	-0.9*	-0.4*
Japan	1.1*	0.9*	-1.0*	-0.3*
United Kingdom	1.1*	2.2*	-1.6*	-0.6
United States	0.8*	1.8*	-1.5*	-0.3*

Note: * denotes statistical significance at the 5 percent level.

city for exports well in excess of that for imports. Previous estimates, however, use measures of foreign income and relative prices that neglect the importance of developing countries' markets for Japanese exports. Because these markets account for more than half of Japanese exports (see Appendix A), their exclusion from the measurement of foreign economic activity understates foreign growth, which causes the relatively high income

es except Germany and Japan. For these two countries, the income
y is not significantly different from zero. For imports, the income
y is 1 for all countries except Canada, Germany, and the United
where the income elasticity is greater than 1. The results also
that short-run price elasticities are, in all cases, less than 1 and
ot significantly different from zero.⁵

TABLE 2
Short-Run Elasticities

	Income		Price	
	Exports	Imports	Exports	Imports
Canada	1.1*	1.3*	-0.5*	-0.1
France	1.8*	1.7*	-0.1	-0.1
Germany	0.5	1.0*	-0.1	-0.2*
Italy	2.3*	1.0*	-0.3*	-0.0
Japan	0.6	1.0*	-0.5*	-0.1
United Kingdom	1.1*	1.0*	-0.2*	-0.0
United States	1.8*	2.3*	-0.5*	-0.6

Note: * denotes statistical significance at the 5 percent level.

evidence thus suggests that, in the short run, national economic
ments are transmitted internationally largely through changes in

Price elasticities:

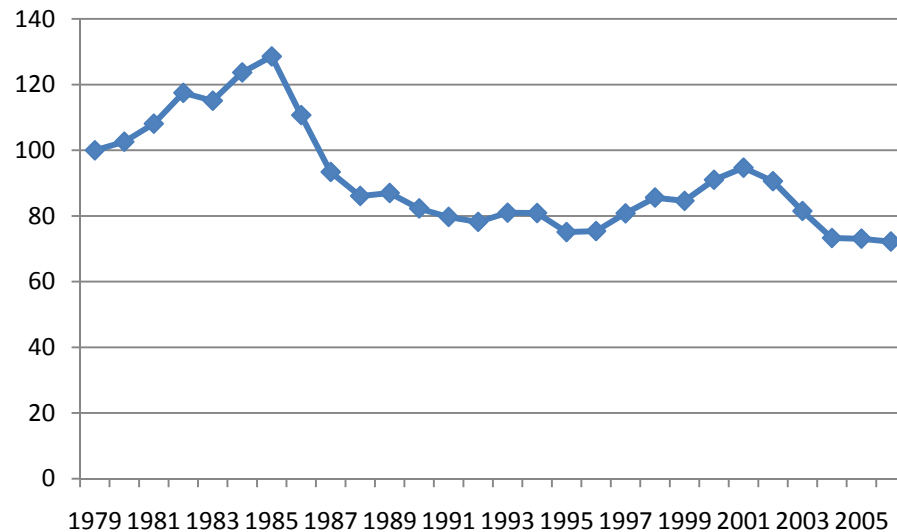
Surprisingly low!

J-curve in short run

Why?

US relative unit labor costs ...

Widespread feeling
they're too low for long run



Income elasticities: Houthakker-Magee effect

$$T = X - EM$$

$$dT/dt = dX/dt - E dM/dt - M dE/dt$$

$$= X (\epsilon_X + \epsilon_M - 1) r + X \zeta_X g^* - X \zeta_M g$$

Where r = rate of depreciation

g = Home GDP growth rate

g^* = foreign GDP growth rate

ζ_X, ζ_M = income elasticities

To maintain balanced trade,

$$r = [\zeta_M g - \zeta_X g^*] / (\epsilon_X + \epsilon_M - 1)$$

path is depreciation; for Italy and Germany, the path is appreciation. Finally, the rate of real depreciation of the U.S. dollar that offsets income effects is 2.8 percent per year, whereas the actual rate of depreciation has been slightly above 1 percent per year. Thus, unless there are shifts in the elasticities and in the trend growth rates, or unless the rate of real depreciation of the dollar accelerates, the U.S. external imbalance will widen.

TABLE 5
Growth, Elasticities, and Real Exchange Rates

	Annual Growth (%)		Annual Real Depreciation (%)	
	Domestic (Δy)	Foreign (Δfy)	Required (\hat{r})	Actual (IMF)
Canada	2.6	2.7	0.8	1.5
France	2.1	2.4	0.6	0.6
Germany	2.7	2.4	-1.2	-1.9
Italy	2.3	2.5	-2.6	0.7
Japan	3.3	3.7	-3.7	-2.3
United Kingdom	1.9	2.5	1.2	-0.6
United States	2.6	3.1	2.8	1.1

Sources: Appendix A, Table A-1, and IMF, *International Financial Statistics*.

¹This equation is derived by Krugman (1989, eq. 7). The minus sign in front of the brackets of the numerator, however, is not in Krugman's equation, which has a typographical error.

²Using the IMF's definition of Δf instead of Δfy would yield a required rate of depreciation of 2.5 percent per year.

Big differences in output and growth

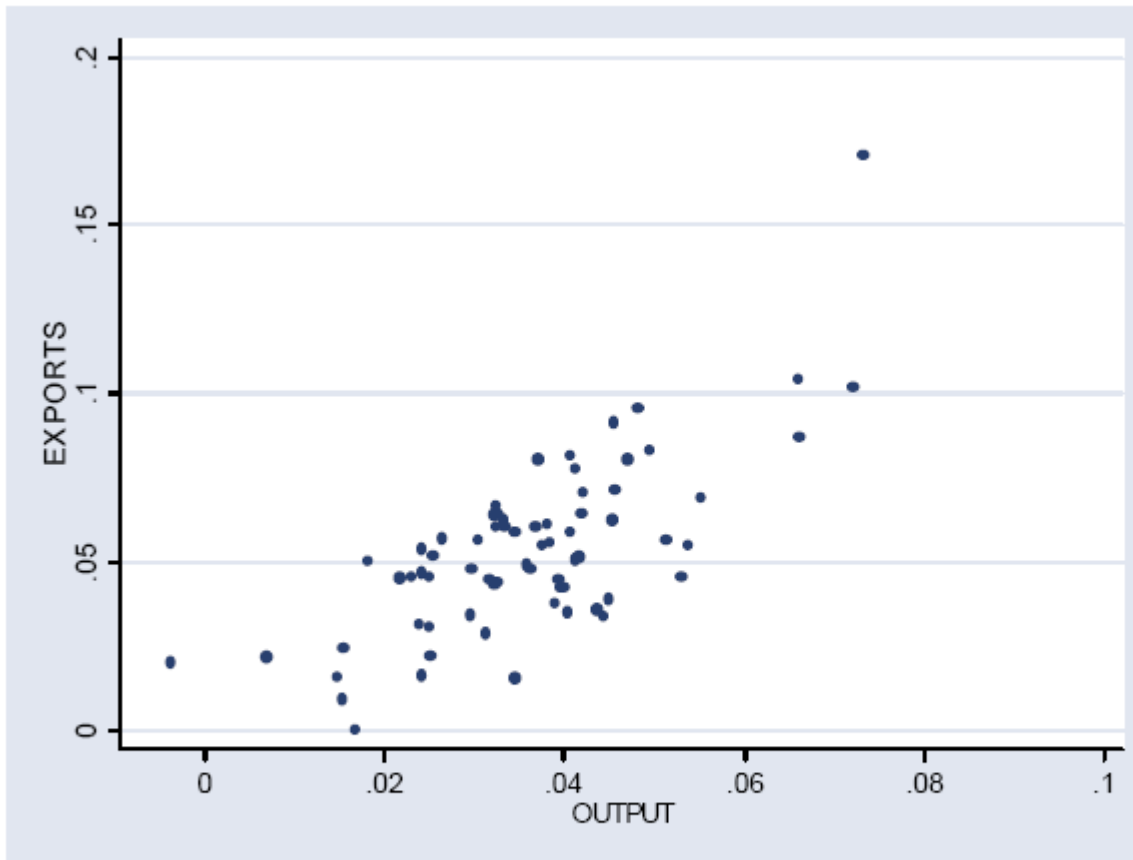


Figure 1. Export Growth and Output Growth, 1960-2000

No systematic relationship between LR export growth
and relative prices

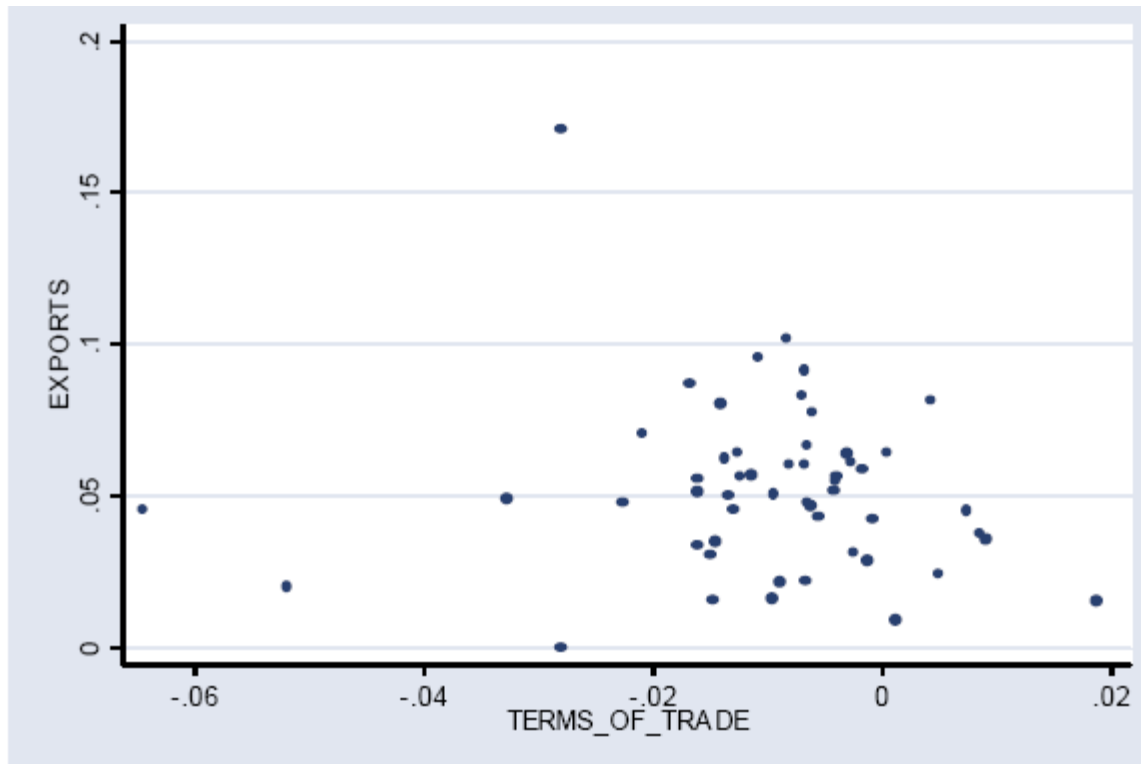


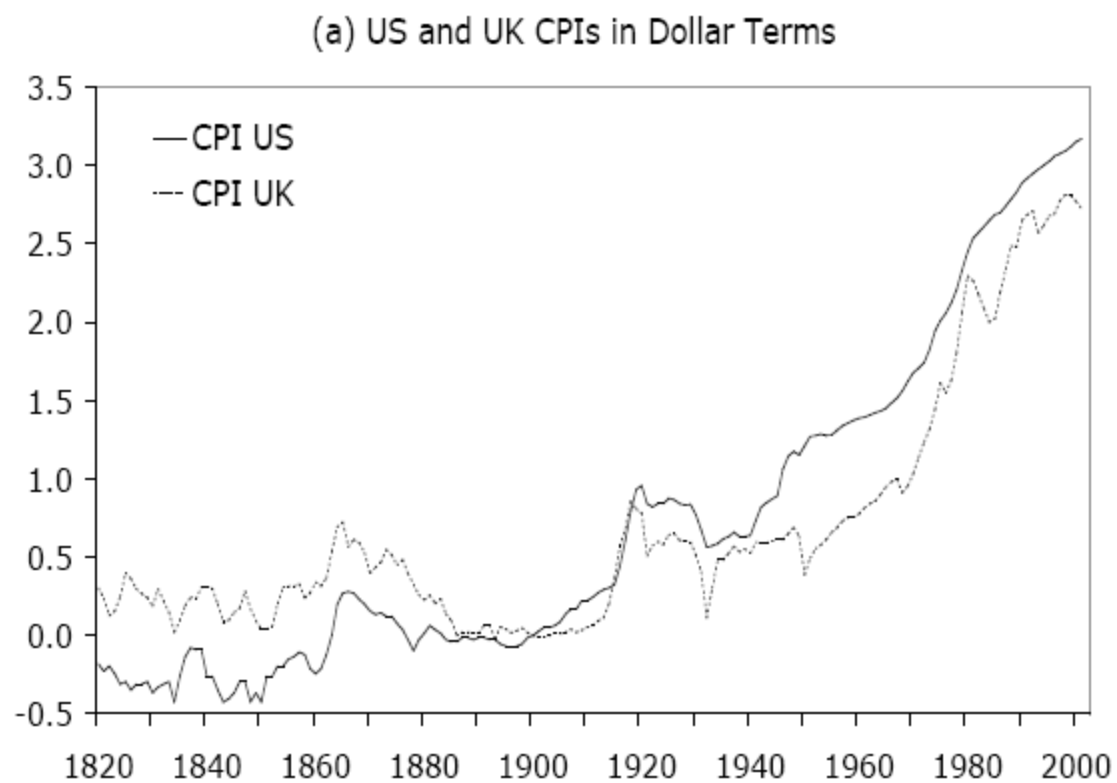
Figure 2. Export Growth and Change in Terms of Trade, 1960-2000

Purchasing power parity:

Absolute: $P = EP^*$

Relative: $P = kEP^*$

Works pretty well in the long run ...



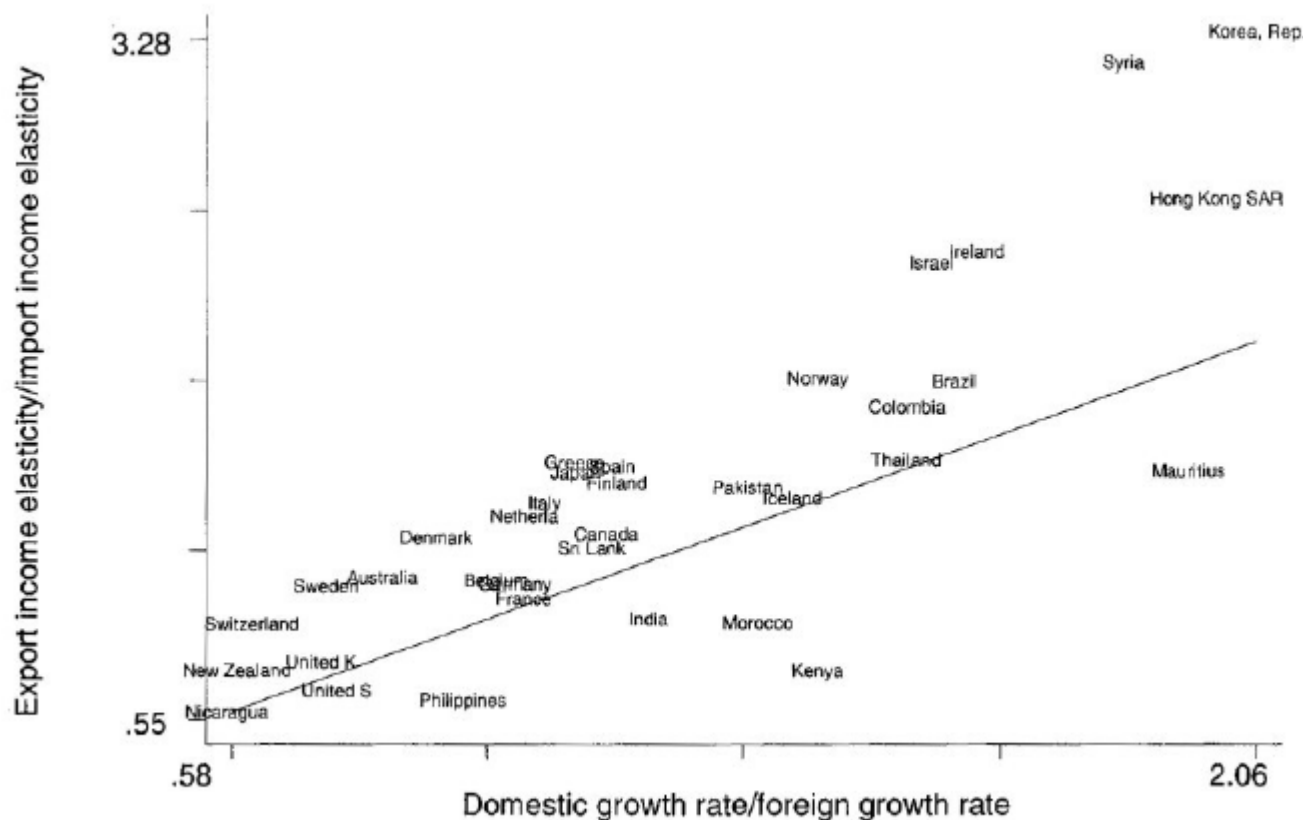
Works for many countries, too



The 45-degree rule?

	Growth	Growth*	ζ_M	ζ_X
Ireland	4.3	2.58	1.42	3.66
UK	2.21	3.04	1.78	1.45

Figure 1a: Krugman's 45-Degree Rule, Whole Sample (1960-98), OLS Elasticity Estimates



Notes: The straight line is the 45-Degree line which goes through the origin and has a slope of one.

OK, fun stuff

But there's another way to look at trade balance:

$$Y = C + I + G + X - M$$

so

$$Y - C - G - I = X - M$$

or

$$X - M = S - I = Y - A \text{ ("absorption")}$$

Leave on one side what determines A; even so, how can these two views be reconciled?

Beware the doctrine of immaculate transfer

One simple model:

2 countries, Home and Foreign; each specialized in producing one good, with outputs Y, Y^*

Cobb-Douglas preferences: Home spends share h on its good, $1-h$ on foreign
Foreign spends h^* , $1-h^*$

Home makes *transfer* T to Foreign

Let E be relative price of foreign good

Market clearing:

$$Y = h(Y-T) + h^*(EY^* + T)$$

$$\Rightarrow E = [(1-h)Y + (h-h^*)T]/h^*Y^*$$

Transfer problem debate between Keynes and Ohlin

Is $h > h^*$?

Another simple model: 2 goods, traded good X and nontraded N

Production of both fixed; traded good price given

Cobb-Douglas again, this time with share n spend on N; price of traded is 1, nontraded P

Production of both goods fixed (not essential)

Inward transfer of T

Market clearing: $P_N = n(X + P_N + T)$

$$\Rightarrow P = n(X+T)/(1-n)$$

Next class, much elaborated versions of these 2 models by Obstfeld-Rogoff, Eaton-Kortum