Question 1. True/False: Bretton Woods/EMS (40 points)

For this question, write no more than one paragraph for each question. Is each of the following statements true or false? Explain your answer.

i) Under the Bretton Woods monetary system, an increase in world gold production - perhaps due to new gold discoveries - relative to the production of all other goods might have required that all currencies be revalued relative to gold to restore credibility to the fixed exchange rate system.

FALSE: When the supply of gold relative to all other goods rises, the relative economic value of gold in terms of goods falls. This should be reflected in a fall in the nominal price of gold relative to the nominal price of goods: $g/P should decline. This can be achieved either by a worldwide inflation of goods prices or by a decline in the nominal price of gold. Under Bretton Woods, the price of gold is fixed in $'s and all other currencies pegged to the $. Thus only a revaluation of the $ in terms of gold is required to induce the necessary fall in the world price of gold. In other words, a fall in the $ price of gold implies that any currency in the system now has a lower gold price since they have fixed $ prices.

ii) Under the Bretton Woods monetary system, a persistent balance of payments deficit for the US would have caused the gold reserves of the Fed. to fall while the dollar reserves of all other central banks would rise.

FALSE: A balance of payments deficit for the US reflects in a net decrease in the total net foreign assets held by the US or lower net acquisitions of foreign assets by the US than net acquisitions of US assets by all other central banks over some period of time. Hence, under the Bretton Woods system in which the US holds gold as its primary reserve asset, a balance of payments deficit typically reflects in lower gold reserves held by the US (as the Fed met excess demands for gold for international payments purposes), while the set of countries with which the US experienced balance of payments deficits would experience a rise in their net holdings of $ assets as central banks purchased the excess supply of $'s generated by the balance of payments surplus. However, not all central banks in the system need be associated with payments surpluses with the US. The US could have run surpluses with some countries but bigger deficits with others.

iii) Restrictive monetary policy conducted by the Bundesbank tends to reduce the DM price of an ecu.

TRUE: Restrictive monetary policy - tight money supply rules or high interest rates that contract demand and so inflationary forces in the economy - tends to raise DM interest returns on DM assets and to keep the prices of German goods low. Thus, both DM assets and goods are highly competitive in world and European markets and the DM tends to experience high relative demand within Europe. Then, within the range of ecu values at which the Dm is permitted to trade, the DM would tend to trade at the lower ecu price admissible under ERM - to be highly valued relative to the ecu (and so other European currencies).

iv) If the pound sterling reaches its upper margin price against the French franc, then the Bank of England must intervene in the foreign exchange market by selling ecu reserves and purchasing pounds while the Bank of France must buy ecu reserves and sell pounds.
**FALSE:** The upper margin price of the pound sterling in terms of French francs is that price at which the pound is at its highest franc value - i.e. the pound is highly valued relative to the franc and tends to trade at a high ecu price relative to the franc. The Bank of England AND the Bank of France must both intervene when one of their respective currencies reaches a margin price in order to reattain a more central exchange rate and prevent speculation against the peg's maintenance. This is MARGINAL INTERVENTION which requires, in this case, that both central banks intervene to reduce the value of the pound relative to the franc. This requires that both banks sell ecu reserves and/or pounds and purchase francs. They cooperate in intervening to depreciate the pound. Neither supports the pound by buying it.

*(NOTE: If you treat the upper margin price of the pound as being the upper price of the franc in terms of pounds (i.e. the pound's lowest franc value) you may take full points provided that the remainder of your argument is correct and consistent with that assumption.)*

v) Bretton Woods and the EMS are identical international monetary systems in which gold has simply been replaced by the ecu as the relevant reserve asset.

**FALSE:** There are many differences between the two monetary systems. "Unilateral" decisions to re/devalue currencies are not admissible under the EMS but require agreement by EMS members. All EMS currencies are pegged at central rates to the ecu and hold ecu reserves while under Bretton Woods only the dollar was directly pegged to gold and most countries held mainly $US reserves. Central banks cooperate to maintain bilateral currency rates in a systematic manner under the EMS. Most importantly, the ecu is not a scarce commodity with a supply - and hence a relative price - dependent on private production incentives which can change independently of the international monetary system but which have profound effects on the viability of current fixed exchange rates. In addition, however, the scarcity of the supply of gold is perhaps why the pre-1970 behaviour of world prices was so stable relative to post-1970 prices.

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**Question 2. International Money and Capital Markets (60 points)**

i) Answer questions #1 and #2 at the end of Chapter 4.

**#1.** e=1.6, F=1.64, i=0.09, i*=0.08

Exact solution: \[ CD = \frac{(F-e)(1+i^*)-(1+i)}{e} = \frac{(1.64/1.6)(1.08)-(1.09)}{(1.025)(1.08)-(1.09)} = 0.017 \]

Approximate solution: \[ CD = \frac{(F-e)}{e} + i^* - i = \frac{0.025}{0.09} + 0.08 - 0.09 = 0.015 \]

Differ by 0.002 = 0.2% = (F-e)/e(i*)

CD>0 implies invest in foreign (UK) assets; there are capital flows out of the US into the UK.

**#2.** Can borrow at i=0.1, lend at 0.08 plus the rate of domestic currency depreciation.

Hence compare 0.1 and 0.08 + (F-e)/e = 0.08 + 0.025 = 0.105.

(Or compare 1.1 and 1.08(1.025) = 1.107)
Can make a profit of 0.005 = 0.5% on each currency unit invested (by approximate solution) or
0.007 = 0.7% (by exact solution).

If there are transactions costs of 0.75% on each unit invested abroad then the net gain from a
covered foreign investment is -0.25% (or 0.05% by exact solution). Hence losses are made once
the costs of transacting are accounted for.

ii) Answer questions #1, #2, #3 and #5 at the end of Chapter 5.

#1. Rus = 0.12, Rca = 0.06 + E{e(t+1)-e(t)/e(t)} = 0.06 + {E(e(t+1))-0.8}/0.8

UIRP implies 0.12 = 0.06 + {E(e(t+1)-e(t))/e(t)}, hence E(e(t+1)) = 0.848

$US expected to depreciate against the Canadian $ by 0.048c/$C

Problems: Risk neutrality assumed: could have risk premia to account for that prevent
equalization of expected returns on uncovered investments. In other words, the calculated
expected rate of depreciation could be over or under estimated. Also, have not accounted for
transactions costs, government regulations, and political risks that prevent the two types of assets
being strictly comparable.

#2. CIRP and PPP hold.

(F-e)/e = 0.05 = E(e(t+1)-e(t))/e(t)
Inflation = expected inflation = 0.1
i=0.08

CIRP implies: (F-e)/e = i - i* = 0.05 = 0.08 - i* .
Hence i* = 0.03.

In addition, we know that r = 0.08 - 0.1 = -0.02.
And, from CIRP and PPP

(F-e)/e = i - i* = r - r* + E(p(t+1)-p(t))/p(t) - E(p*(t+1)-p*(t))/p*(t) = r - r* + E(e(t+1)-e(t))/e(t).
Thus, 0.05 = r-r*+0.05 implies that r=r*=-0.02.

Nominal interest rates reflect (expected) inflation differentials since investors always account for
changes in real returns over time due to domestic inflation. Real interest rates are equalized
across countries since investors ultimately care about domestic consumption returns to holding
any asset and arbitrage ensures these real returns are equalized in equilibrium subject to risk
premia. (Here, risk premia are absent since inflation rates (and all other factors) are expected to
be constant over time.)

#3. i=0.18, i*=0, E(e(t+1)-e(t))/e(t) = 0.2

Hence compare 0.18 with 0.2 implying that Mexican residents will hold $US's provided they can
realize the exchange rate gain due to the domestic currency's depreciation. Since Mexicans can
always buy - and hence sell - $US's in the black market, they will be willing to buy $US's at e(t)
and sell them in the black market at e(t+1). This assumes that there are no or sufficiently low
expected legal costs of transacting in the black market, and that the black market exchange rate
at which a private citizen can buy and sell $US's reflects the legal market exchange rate.
#5. Expected depreciation of punt implies that \( E(e(t+1)) > e(t) \), hence uncovered investment decisions based on comparisons of \( i \) and \( i^* + E(e(t+1) - e(t)/e(t)) \) would generally lead both Irish and foreign investors to hold non-Irish assets. Ireland would experience capital outflows and these produce a fall in the demand for the Irish punt, and a consequent downward pressure on its value.

iii) Expected inflation differentials cause interest rate changes, which in turn bring about exchange rate changes. Is this statement true or false? Explain.

FALSE: Certainly, expected inflation differentials should be reflected in nominal (local currency) interest rates according to the Fisher relation. Thus expected inflation differentials across countries will affect real ex ante (expected) returns to alternative assets. However, in general expected inflation, interest rates and exchange rates are simultaneously determined and one should not make statements about uni-directional causation. For example, in class we have discussed how exchange rate changes can bring about inflation rate and interest rate changes (as in Mexico) and also how interest rate changes (perhaps due to changes in the money supply) can bring about changes in the level of demand and hence in prices of goods and the inflation rate.

iv)

a) **Transactions costs** in international money and capital markets: mean that for any given domestic asset return we require some compensation in a higher foreign return for the additional transactions undertaken to accomplish a foreign asset purchase.

b) **Government regulations** such as foreign exchange controls and capital controls that limit domestic investors' opportunities to hold foreign assets and exploit the available arbitrage opportunities deriving from return differentials.

c) **Financial and Borrowing constraints** which limit investors' ability to borrow at home or abroad in seeking to exploit arbitrage opportunities deriving from return differentials.

d) **Political Risk, Exchange Risk, Inflation Risk and other sources of non-comparability** which call for returns to be adjusted to compensate for differential riskiness across alternative assets.