COMM 220 – PRACTICE PROBLEM SET 5 SOLUTIONS

1 (a)

	U.S.	Canada
Tomatoes (in kg)	180,000	80,000
Potatoes (in kg)	135,000	120,000
MRT_{TP}	0.7500	1.5000
MRT_{PT}	1.3333	0.6667

The opportunity cost of 1 kg of tomatoes in Canada is 1.5 kg of potatoes, and in U.S. it is 0.75 kg of potatoes. U.S. has a comparative advantage in producing tomatoes because fewer potatoes must be given up to produce an extra kg of tomatoes.

The opportunity cost of 1 kg of potatoes in Canada is 0.6667 kg of tomatoes, and in U.S. it is 1.3333 kg of tomatoes. Canada has a comparative advantage in producing potatoes because fewer tomatoes must be given up to produce an extra kg of potatoes.

(b) Canada produces 30,000 more kg of potatoes and 20,000 fewer in tomatoes. U.S. produces 30,000 fewer kg of potatoes and 40,000 more in tomatoes. The world gains 20,000 kg in tomatoes for a 30,000 kg specialization in potatoes.

Canada trades 1 kg of potatoes for 1.05 kg of tomatoes with U.S.:

Price ratio = 1.05	U.S.	Canada
Price ratio x 30,000	–31,500	31,500
MRT_{PT} x 30,000	40,000	–20,000
Gain (tomatoes)	8,500	**11,500**

(c) U.S. produces 30,000 more kg of tomatoes and 22,500 fewer in potatoes. Canada produces 30,000 fewer kg of tomatoes and 45,000 more in potatoes. The world gains 22,500 kg in potatoes for a 30,000 kg specialization in tomatoes.

Canada trades 1 kg of tomatoes for 1.05 kg of potatoes with U.S.:

Price ratio = 1.05	U.S.	Canada
Price ratio x 30,000	31,500	–31,500
MRT_{PT} x 30,000	–22,500	45,000
Gain (potatoes)	9,000	**13,500**

2 (a) The expected value of the Euro in a year, $E(p_1)$:

$E(p_1)$ = 1.3230*1.0209/1.0283 = **1.3135**

(b) Arbitrage opportunity when f_0 = 1.3168 > $E(p_1)$ = 1.3135

Arbitrage profit with $1 million Canadian:

	Today	In one year
Borrow C$1 million in Canada	Borrow $1,000,000	Repay $1,020,900
Invest in Germany	Invest €755,857.8987	Receive €777,248.6772
Sell € forward		Receive $1,023,481.06
Arbitrage profit		**$2,581.06**

(c) Arbitrage opportunity when $f_0 \neq E(p_1)$: f_0 = 1.3112 < $E(p_1)$ = 1.3135

Arbitrage profit with $1 million Canadian:

	Today	In one year
Borrow C$1 million in Germany	Borrow €755,857.8987	Repay €777,248.6772
Invest in Canada	Invest $1,000,000	Receive $1,020,900
Buy € forward		Pay $1,019,128.47
Arbitrage profit		**$1,771.53**