Financial Markets **Quiz 4 A**
HEC school of Management, Paris **Profs. Lovo & Ors**

LAST NAME _____ FIRST NAME _____

A coupon-paying bond B has exactly two years until to its maturity and a par (face) value of € 1,000. Bond B makes coupon payments of € 20 once a year. The yield curve is flat at 2%.

a) What is the spot (cash) market price of bond B?

- ❑ 893.00
- ❑ 926.66
- ❑ 962.28
- ❑ 1,000.00
- ❑ 1,020.00

b) What should be today's price of a forward ($F_{0,\ 18\ mos}$) which calls for the delivery of bond B in 18 months?

- ❑ 1,009.95
- ❑ 1,040.20
- ❑ 1,070.75
- ❑ 1,101.58

c) The price of the same forward in the market place is 1,020. Show exactly how you can do arbitrage by filling the table below. Label your transactions clearly.

TRANSACTIONS	CASH-FLOWS				
	t=0	**t=6 months**	**t=12 months**	**t=18 months**	**t=24 months**

Financial Markets **Quiz 4 B**
HEC school of Management, Paris **Profs. Lovo & Ors**

LAST NAME _____ FIRST NAME _____

A coupon-paying bond B has exactly two years until to its maturity and a par (face) value of € 1,000. Bond B makes coupon payments of € 40 once a year. The yield curve is flat at 4%.

a) What is the spot (cash) market price of bond B?

- ❑ 928.67
- ❑ 963.33
- ❑ 1,000.00
- ❑ 1,038.83
- ❑ 1,040.00

b) What should be today's price of a forward ($F_{0,\ 18\ mos}$) which calls for the delivery of bond B in 18 months?

- ❑ 989.75
- ❑ 1,019.80
- ❑ 1,050.15
- ❑ 1,080.80

c) The price of the same forward in the market place is 1,010. Show exactly how you can do arbitrage by filling the table below. Label your transactions clearly.

TRANSACTIONS	**CASH-FLOWS**				
	t=0	**t=6 months**	**t=12 months**	**t=18 months**	**t=24 months**

Financial Markets **Quiz 4 C**
HEC school of Management, Paris **Profs. Lovo & Ors**

LAST NAME _____ FIRST NAME _____

A coupon-paying bond B has exactly two years until to its maturity and a par (face) value of € 1,000. Bond B makes coupon payments of € 60 once a year. The yield curve is flat at 6%.

a) What is the spot (cash) market price of bond B?

- ❑ 964.33
- ❑ 1,000.00
- ❑ 1,037.72
- ❑ 1,060.00
- ❑ 1,077.66

b) What should be today's price of a forward ($F_{0,\ 18\ mos}$) which calls for the delivery of bond B in 18 months?

- ❑ 969.55
- ❑ 999.41
- ❑ 1,029.56
- ❑ 1,060.02

c) The price of the same forward in the market place is 1,040. Show exactly how you can do arbitrage by filling the table below. Label your transactions clearly.

TRANSACTIONS	CASH-FLOWS				
	t=0	**t=6 months**	**t=12 months**	**t=18 months**	**t=24 months**

Financial Markets **Quiz 4 D**
HEC school of Management, Paris **Profs. Lovo & Ors**

LAST NAME _____ FIRST NAME _____

A coupon-paying bond B has exactly two years until to its maturity and a par (face) value of € 1,000. Bond B makes coupon payments of € 80 once a year. The yield curve is flat at 8%.

a) What is the spot (cash) market price of bond B?

- ❑ 1,000.00
- ❑ 1,036.67
- ❑ 1,075.44
- ❑ 1,080.00
- ❑ 1,116.49

b) What should be today's price of a forward ($F_{0,\ 18\ mos}$) which calls for the delivery of bond B in 18 months?

- ❑ 949.35
- ❑ 979.01
- ❑ 1,008.97
- ❑ 1,039.23

c) The price of the same forward in the market place is 1,030. Show exactly how you can do arbitrage by filling the table below. Label your transactions clearly.

TRANSACTIONS	CASH-FLOWS				
	t=0	**t=6 months**	**t=12 months**	**t=18 months**	**t=24 months**

Financial Markets **Quiz 4 A**
HEC school of Management, Paris **Profs. Lovo & Ors**

LAST NAME _____ FIRST NAME _____

A coupon-paying bond B has exactly two years until to its maturity and a par (face) value of € 1,000. Bond B makes coupon payments of € 20 once a year. The yield curve is flat at 2%.

a) What is the spot (cash) market price of bond B?

- ❑ 893.00
- ❑ 926.66
- ❑ 962.28
- ❑ 1,000.00 ←
- ❑ 1,020.00

b) What should be today's price of a forward ($F_{0,\ 18\ mos}$) which calls for the delivery of bond B in 18 months?

- ❑ 1,009.95 ←
- ❑ 1,040.20
- ❑ 1,070.75
- ❑ 1,101.58

c) The price of the same forward in the market place is 1,020. Show exactly how you can do arbitrage by filling the table below. Label your transactions clearly.

	CASH-FLOWS				
TRANSACTIONS	**t=0**	**t=6 months**	**t=12 months**	**t=18 months**	**t=24 months**
Sell forward in the market	0	0	0	$F_0 - S_{18}$ $=1020 - S_{18}$	0
Buy REPLICATING P/F					
Buy Bond	$-S_0 = -1000$	0	$+C = +20$	$+S_{18}$	0
Borrow 19.61 for 1 year at the risk-free rate	+19.61	0	-19.61×1.02 $= -20$	0	0
Borrow 1000–19.61 for 1.5 years at risk-free rate	+980.39	0	0	-980.39 $\times 1.02^{1.5}$ $= -1,009.95$	0
TOTAL	0	0	0	+11.05	0

Financial Markets **Quiz 4 B**
HEC school of Management, Paris **Profs. Lovo & Ors**

LAST NAME _____ FIRST NAME _____

A coupon-paying bond B has exactly two years until to its maturity and a par (face) value of € 1,000. Bond B makes coupon payments of € 40 once a year. The yield curve is flat at 4%.

a) What is the spot (cash) market price of bond B?

- ❑ 928.67
- ❑ 963.33
- ❑ 1,000.00 ←
- ❑ 1,038.83
- ❑ 1,040.00

b) What should be today's price of a forward ($F_{0,\ 18\ mos}$) which calls for the delivery of bond B in 18 months?

- ❑ 989.75
- ❑ 1,019.80 ←
- ❑ 1,050.15
- ❑ 1,080.80

c) The price of the same forward in the market place is 1,010. Show exactly how you can do arbitrage by filling the table below. Label your transactions clearly.

	CASH-FLOWS				
TRANSACTIONS	**t=0**	**t=6 months**	**t=12 months**	**t=18 months**	**t=24 months**
Buy forward in the market	0	0	0	$S_{18} - F_0$ $= S_{18} - 1010$	0
Sell REPLICATING P/F					
Short-sell Bond	$+S_0 = +1000$	0	$-C = -40$	$-S_{18}$	0
Lend 38.46 for 1 year at the risk-free rate	–38.46	0	+38.46x1.04 = +40	0	0
Lend 1000–38.46 for 1.5 years at risk-free rate	–961.54	0	0	+961.54 $x1.04^{1.5}$ = +1,019.80	0
TOTAL	0	0	0	+9.80	0

Financial Markets **Quiz 4** **C**
HEC school of Management, Paris **Profs. Lovo & Ors**

LAST NAME _____ FIRST NAME _____

A coupon-paying bond B has exactly two years until to its maturity and a par (face) value of € 1,000. Bond B makes coupon payments of € 60 once a year. The yield curve is flat at 6 %.

a) What is the spot (cash) market price of bond B?

- ❑ 964.33
- ❑ 1,000.00 ←
- ❑ 1,037.72
- ❑ 1,060.00
- ❑ 1,077.66

b) What should be today's price of a forward ($F_{0,\ 18\ mos}$) which calls for the delivery of bond B in 18 months?

- ❑ 969.55
- ❑ 999.41
- ❑ 1,029.56 ←
- ❑ 1,060.02

c) The price of the same forward in the market place is 1,040. Show exactly how you can do arbitrage by filling the table below. Label your transactions clearly.

	CASH-FLOWS				
TRANSACTIONS	**t=0**	**t=6 months**	**t=12 months**	**t=18 months**	**t=24 months**
Sell forward in the market	0	0	0	$F_0 - S_{18}$ $=1040 - S_{18}$	0
Buy REPLICATING P/F					
Buy Bond	$-S_0 = -1000$	0	$+C = +60$	$+S_{18}$	0
Borrow 56.60 for 1 year at the risk-free rate	+56.60	0	-56.60×1.06 $= -60$	0	0
Borrow 1000–38.46 for 1.5 years at risk-free rate	+943.40	0	0	-943.40 $\times 1.06^{1.5}$ $= -1,029.56$	0
TOTAL	0	0	0	+10.44	0

Financial Markets **Quiz 4 D**
HEC school of Management, Paris **Profs. Lovo & Ors**

LAST NAME _____ FIRST NAME _____

A coupon-paying bond B has exactly two years until to its maturity and a par (face) value of € 1,000. Bond B makes coupon payments of € 80 once a year. The yield curve is flat at 8%.

a) What is the spot (cash) market price of bond B?

- ❑ 1,000.00 ←
- ❑ 1,036.67
- ❑ 1,075.44
- ❑ 1,080.00
- ❑ 1,116.49

b) What should be today's price of a forward ($F_{0,\ 18\ mos}$) which calls for the delivery of bond B in 18 months?

- ❑ 949.35
- ❑ 979.01
- ❑ 1,008.97
- ❑ 1,039.23 ←

c) The price of the same forward in the market place is 1,030. Show exactly how you can do arbitrage by filling the table below. Label your transactions clearly.

	CASH-FLOWS				
TRANSACTIONS	**t=0**	**t=6 months**	**t=12 months**	**t=18 months**	**t=24 months**
Buy forward in the market	0	0	0	$S_{18} - F_0$ $= S_{18} - 1030$	0
Sell REPLICATING P/F					
Short-sell Bond	$+S_0 = +1000$	0	$-C = -80$	$-S_{18}$	0
Lend 74.07 for 1 year at the risk-free rate	–74.07	0	+74.07x1.08 = +80	0	0
Lend 1000–74.07 for 1.5 years at risk-free rate	–925.93	0	0	+925.93 $x1.08^{1.5}$ = +1,039.23	0
TOTAL	0	0	0	+9.23	0