Instructions -- Part 1 of 3

General Instructions

This is an experiment in the economics of market decision-making. If you follow the instructions carefully and make good decisions you may earn a considerable amount of money that will be paid to you after the session. **You will participate in one or more sequences each consisting of 10 trading periods.**

There are two objects of interest in this experiment: francs and assets.

At the start of each trading **period**:

- You will receive 101 francs in odd periods and 5 francs in even periods.
- In addition you will earn 1 franc for each unit of the asset you hold.

At the beginning of a trading **sequence**:

- You will receive an initial endowment of 1 asset.

During the trading period you may place orders to buy from or sell assets to other participants using francs. The number of assets you own carry over from one period to the next. However, your franc balance does not--you start each period with the endowment of francs indicated by your endowment process in even and odd periods. Therefore, there are two reasons to hold assets:

1. They provide additional francs at the beginning of each period.
2. Assets may be sold for francs in some future period.

Your Earnings

At the end of each period, your inventory of francs will be allocated to your "Payment Account" and converted into US dollars. These dollar earnings will accumulate across periods and sequences and be paid to you after the session concludes.

- Francs received from sales will be added to the payment account and any francs not used in a purchase will automatically go to your payment account.

Below is a calculator you will have access to throughout the experiment to compute the cash value of francs.

Allocation to Payment Account ❓

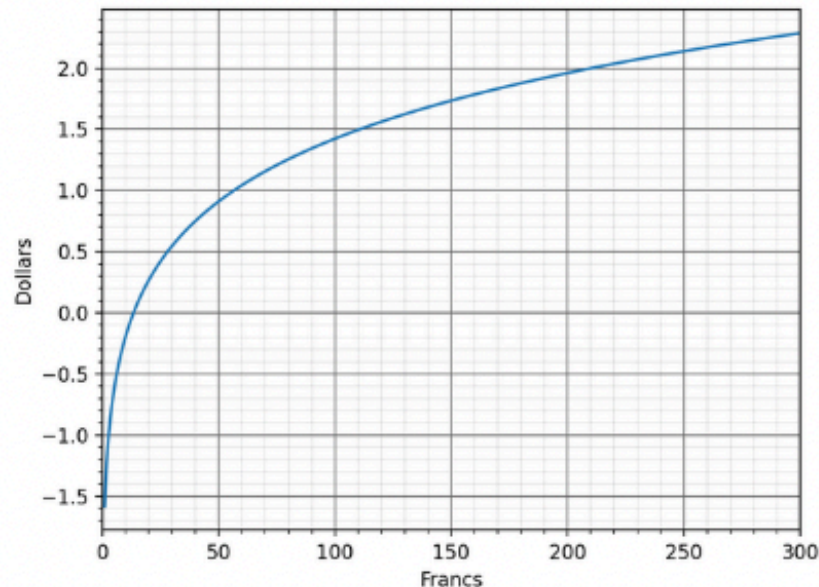0   ❓102

Amount: 0	Remaining Balance: 102.00
Value: $-10.00	❓Weighted Value: $-10.00

The payoff chart below provides a graphical illustration of the payoffs for a period.

$$8.419051 \times francs^{0.06627633} - 10$$

There are a few things to notice:

1. Very low numbers of francs yield negative dollar payoffs.
2. The more francs you earn in a period, the higher will be your dollar earnings for that period.
3. The dollar payoff from each additional franc that you earn in a period is diminishing. For example, the payoff difference between 56 and 57 francs is larger than the difference between 93 and 94.

Note: The total number of francs and assets held by all participants in this market does not change over the course of a sequence. Further, the number of francs provided by each asset, 1, is the same for all participants.

Payoff Weighting

The cash you earn in each period is multiplied by a "weighting term," that decreases over time. Specifically, the cash you earn in period t is multiplied by $0.9^{(t-1)}$. For example, if you earn $3 from your choices in period 3, the cash you earn in that period will be $(0.9)^2 \times \$3 = \$2.43$.

The on screen calculator displays the Weighted Value in the lower right.

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Additional Payoff

In addition to the weighted cash you earn in periods 1 to 10 as described in the previous screens, you will also receive an additional payoff that depends on the choices that you and all other participants made in periods 1 to 10. These additional payoffs are intended to capture the francs allocated to the payment account after period 10 as if the sequence were to continue. The computer will calculate these francs for you, as explained below.

- The computer will use your average franc allocation to the payment account in even and odd periods to simulate your behavior into an infinite number of subsequent periods.

These simulated period earnings will be added to your session earnings, however since each period is weighted by $(0.9)^{(t-1)}$, as the period number gets high your additional earnings will eventually become zero. Therefore you will not earn an infinite amount of money in this experiment, however **a larger average earnings in periods 1-10 will mean a larger earnings in simulated periods 11 and after.**

Quiz 1

Below is the information about your franc and asset holdings and the slider calculator that you will have available throughout the trading periods. Use the example to answer the following questions.

Market -- Period 1 of 10

Your Francs

| From dividends: 1 |
| From endowment: 101 |
| Total: 102 francs |

Allocation to Payment Account 🔵

0   🔵102

| Amount: 0 | Remaining Balance: 102.00 |
| Value: $-10.00 | Endowment next period: 5 | 🔵Weighted Value: $-10.00 |

Your Assets: 1 asset(s)

You may attempt this quiz as many times as needed and you will not be penalized for incorrect answers.

1. What is the number of assets you own?

[   ]

2. What is the total number of francs you have available, including both your endowment of francs and the francs you get as dividends for each unit of asset you own at the start of the period?

[   ]

3. Suppose that at the end of the first period you have not bought or sold any assets, so your franc total is the same as at the start of the period (your answer to question 2). What is your payoff in dollars for this first period? (Use the slider tool above):

[   ]

4. Suppose that the sequence continues with period 2 and that you did not buy or sell any assets in the first period, so you own the same number of assets as in period 1. What is the total number of francs you have available at the start of period 2 (This number includes both your endowment of francs and the 1 francs you get for each unit of the asset you own at the start of a period)?

[   ]

[▦]

Use the image below to answer the following question.

Market -- Period 2 of 10

Your Francs

| From dividends: 1.00 |
| From endowment: 5 |
| Total: 6.00 francs |

Allocation to Payment Account 🔵

0   🔵6.00

| Amount: 6 | Remaining Balance: 0.00 |
| Value: $-0.52 | Endowment next period: 101 | 🔵Weighted Value: $-0.47 |

Your Assets: 1.00 asset(s)

Buy Order	🔵 Max total cost: 0	**Sell Order**	🔵 Min total value: 0
Number of assets you want to buy:	The highest price at which to buy:	Number of assets you want to sell:	The lowest price at which to sell:
[0.00]	[0.00] [francs]	[0.00]	[0.00] [francs]

[Submit]

5. Suppose that at the end of period 2 you have not bought or sold any assets, so your franc total is the same as at the start of the period--as shown in the image above. What is your payoff in dollars for this second period?

[   ]

6. In addition to the weighted payoffs you earn through periods 1 to 10, you automatically receive additional weighted payoff computed using your average franc allocation to the payment account in periods 1 through 10.

[--------- ▾]

Sequences of Trading Periods

Today's session consists of several sequences, which are further broken down into 10 different periods. Each period lasts 3 minutes. The cash you earn in each period will be weighted by a weighting term, as explained in the previous section "Payoff Weighting". After period 10 of each sequence, you will also receive an additional payoff that depends on the choices that you and all other participants made in periods 1 to 10, as previously explained in the "Additional Payoff" section. Depending on the time available, we may start a new sequence.

«	1	2	3	4	Quiz	»

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Market and Trading Rules

Each period you will have a trading interface similar to the one seen below. You can use this interface to buy and sell units of the asset. The number of francs and assets you have available is shown in the upper left.

Market -- Period 1 of 10

Your Francs

From dividends: 1.00	
From endowment: 101	
Total: 102.00 francs	

Allocation to Payment Account ❓

0   ❓102.00

Amount: 51	Remaining Balance: 51.00	
Value: $0.93	Endowment next period: 5	❓Weighted Value: $0.93

Your Assets: 1.00 asset(s)

Buy Order   ❓ Max total cost: 0

Number of assets you want to buy:

`0.00`

The highest price at which to buy:

`0.00` francs

Sell Order   ❓ Min total value: 0

Number of assets you want to sell:

`0.00`

The lowest price at which to sell:

`0.00` francs

Submit

Selling

Each trading period, if you wish to sell units of the asset you can send in a **Sell Order**. Your sell order indicates the number of units of the asset you are offering to sell and the lowest price, per unit, that you are willing to accept.

Buying

Similarly, if you wish to purchase units of the asset you can send in a **Buy Order**. Your buy order indicates the number of units you would like to buy and the highest price, per unit, that you are willing to pay.

Notes on selling and buying

- You may choose to simultaneously submit buy and sell orders. The price at which you offer to buy must be less than the price at which you offer to sell.
- The price you specify in your order is a per-unit price at which you are offering to buy or sell each unit of the asset.
- Your orders to sell are limited by your inventory of the asset, and your orders to buy are limited by your francs on hand and price.
- You may place buy and sell orders for fractions of a unit.

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Trading Price

The trading price is determined as follows

1. The program sorts buy orders by price from high to low. Sell orders are sorted by price from low to high
2. The program selects all buy and sell order pairs where purchase price is greater than the sale price.
3. The market price is calculated midway between the lowest filled buy order and highest filled sell order. All buy orders above the market price will trade at the market price. All sell orders below the market price will trade at the market price. All other orders will remain unfilled.

Examples of how the market works

Example 1: Suppose that in period 7 four traders participate in the market and:

- Trader 1 submits an offer to buy at 60
- Trader 2 submits an offer to buy at 20
- Trader 3 submits an offer to sell at 10
- Trader 4 submits an offer to sell at 40

At any price above 40, there are more units offered for sale than for purchase. At any price below 20 there are more units offered for purchase than for sale. At any price between 20 and 40 there is an equal number of units offered for purchase and for sale. **The trading price is the average price at which there is an equal number of units offered for purchase and for sale.** In this example that price is 30. Trader 1 makes a purchase from trader 3 at a price of 30.

Example 2: Suppose that in period 7 four traders participate in the market and:

- Trader 1 submits an offer to buy at 3.60
- Trader 2 submits an offer to buy at 3.20
- Trader 3 submits an offer to sell at 3.10
- Trader 4 submits an offer to sell at 3.00

At any price between 3.10 and 3.20 there is an equal number of units offered for purchase and for sale. The trading price is the average price at which there is an equal number of units offered for purchase and for sale. In this example that price is 3.15. Traders 1 and 2 make a purchase from traders 3 and 4 at a price of 3.15.

Recording your earnings

At the end of each period, a summary screen will be provided to you (an example is illustrated below).

Results for Period 1

In the previous market round you **sold 0 assets** and **purchased 0 assets**.

The Trading Price: 0.00 francs

Beginning Francs	102.00 francs
Net Sales (Sales minus Purchases)	0.00 francs
Closing Assets on Hand:	1.00 Assets
Amount allocated to payment account Value:	102.00 francs $1.45
Earnings from price forecast:	$0.07
Cumulative Earnings from market sequence:	$1.52

Next

The blue box contains information about any sales or purchases in addition to the trading price from the most recent trading period.

The table displays:

- The quantity of francs in your inventory at the start of the period.
- The net sales based on the trading price and any fulfilled buy or sell orders.
- The amount of assets you have in your inventory after all trades have been executed.
- The amount of francs allocated to the payment account after all trades have been executed.
- The cash value of the amount allocated to the payment account.
- Your earning from price forecast (which will be explained in a subsequent page).
- Your cumulative earnings from the current market sequence.

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Quiz 2

Consider the following scenarios and answer the questions. The numbers used are merely illustrative; the actual numbers in the experiment may be quite different.

1. How many trading periods do you participate in per sequence?

[   ]

2. Suppose you have 8 assets at the end of period 1, after all trades have been fulfulled. How many assets would you hold at the beginning of the next period?

[   ]

3. Suppose in period, a buy order of 2 units at 40 francs is submitted. According to this order, what is the largest amount that would be paid for 1 unit of the asset?

[--------- ▾]

4. Suppose in a period, two traders participate in the market. Trader 1 submits a buy order at 4 francs. Trader 2 submits a sell order at 3 francs. The trading price in this example is:

[--------- ▾]

Submit

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In addition to the money you earn from your trading activity, you can make money by accurately forecasting the trading price of the upcoming period. Before the start of each trading period you will be asked to input your prediction. The money you receive from your prediction will be calculated in the following manner:

Accuracy	Your earnings
Within 10% of actual trading price	$0.07
Within 25% of actual trading price	$0.02
Within 50% of actual trading price	$0.01

The more accurate your forecast, the more you earn.

Next