APPENDIX II

WESTFÄLISCHE
WILHELMS-UNIVERSITÄT
MÜNSTER

Instructions for the experiment „Stock market in the laboratory"

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0.   Introduction

Welcome to this experiment and thank you very much for taking the time to support our research.

Your task for approximately the next two hours will be to trade assets on a computer based trading system.

Before starting the experiment, we would like to familiarize you with the experiment and how the trading software that you will use works.

Therefore we would like to fully explain the three following questions:

> ➢ What will be traded?
> ➢ How does the trading system work?
> ➢ How will you be paid?

In studies like this one it is standard to provide the participants with written instructions and to go through them together, in order to guarantee that every group has exactly the same information about how the experiment works. Please keep general questions until the end of the introduction, as they may be answered during the following explanations. Although if there is something which you do not understand at all, please ask the people in charge, so that they can explain the point in further detail.

1.   *What will be traded?*

In this experiment you will trade very simple assets which you can probably better imagine as bets on the occurrence of a certain future event (e.g. „Germany will be European Soccer Champion 2008"). Depending on whether the event occurs or not the asset will pay the owner either 100 or 0 monetary units (MU). Due to the fact that the outcome of the event is uncertain during the trading period, the price usually varies between the two extremes.

In a market you can always trade three assets simultaneously which all depend on the same basic event. At the end of the event, only one of the three assets will pay 100 MU. To clarify this, we will give you an example which will also be used later in a practice trading round:

Example. The uncertain future event is what share of votes the SPD party will receive in the next election of the German "Bundestag". The three assets relating to this event can be described in the following way:

Asset 1: SPD.[0-29.9]	This asset will pay exactly 100 MU if the SPD share of votes is smaller than 30.0 % or will expire worthless otherwise. The final outcome for this, and the following assets, is based on all valid secondary votes (indirect votes for the party), which is determined by the "Bundeswahlleiter."
Asset 2: SPD.[30.0-34.9]	This asset will pay exactly 100 MU if the SPD share of votes is between 30.0 % and 34.9 % or will expire worthless otherwise.
Asset 3: SPD.[35.0+]	This asset will pay exactly 100 MU if the SPD share of votes is equal to or more than 35.0 % or will expire worthless otherwise.

Please note that after the election of the German "Bundestag" only one out of the three assets will pay 100 MU, while the other two assets will expire worthless (since the intervals cover every possible outcome of the event, but at the same time do not overlap).

Before you start trading you should think about how much you are willing to pay for these assets and for how much you are willing to sell them for in the market. Trading will only occur between the participants of each experimental session. There are no external and/or computer-controlled participants in the market (one small exemption is the unit-portfolio, which will be explained later). Transaction costs do not exist for these assets.

During the experiment you will not trade assets on political events, but on events concerning financial markets, weather and sports. The order in which you will deal with these three topics will be determined randomly and varies for each group.

Furthermore, for each topic the groups will not trade the exact same three assets, since there are two different partitions, which will be assigned to your experiment session randomly. In order to guarantee that each participant has the same information, the following table shows all groups of three assets used in this study (even those that you will not be dealing with) including an accurate description of the payment conditions.

Financial markets ---- Event: DAX-closing in 2 weeks

Asset definition:

An asset will pay 100 MU, if the outcome of the underlying event exactly fits the definition of the asset. All the other assets will expire worthless.

Relevant for the payment of the assets in the financial markets is the Xetra-DAX closing (incl. final auction) in two weeks from today (i.e., on May 8, 2007). Xetra-DAX closing as of April 23, 2007 was 7335.62.

	Partition 1	Partition 2
Asset 1	DAX.[0 - 7248.99]	DAX.[0 - 7415.99]
Asset 2	DAX.[7249 - 7415.99]	DAX.[7416 - 7563.99]
Asset 3	DAX.[7416+]	DAX.[7564+]

Weather ---- Event: Maximum Temperature in Münster at the end of May

Asset definition:

An asset will pay 100 MU, if the outcome of the underlying event exactly fits the definition of the asset. The other two assets will expire worthless.

Relevant for the payment of the assets concerning the weather is the maximum temperature 2 meters above ground-level (abbreviation TX) at the weather center Muenster/Osnabrueck (station no. 10315) on May 31st, 2007 in degrees Celsius determined by Germany's National Meteorological Service ("Deutscher Wetterdienst").

	Partition 1	Partition 2
Asset 1	Temp.[up to 15.9]	Temp.[up to 19.9]
Asset 2	Temp.[16.0 - 19.9]	Temp.[20.0 - 23.9]
Asset 3	Temp.[20.0+]	Temp.[24.0+]

Sports ---- Event: Number of goals scored on the 34th matchday of the German 1. Bundesliga (Season 2006/2007)

Asset definition:

An asset will pay 100 MU, if the outcome of the underlying event exactly fits the definition of the asset. The other two assets will expire worthless.

Relevant for the payment of the assets concerning sports is the number of goals scored on the final matchday of the German 1. Bundesliga in season 2006/2007 (soccer/men).

	Partition 1	Partition 2
Asset 1	Goals.[0 - 20]	Goals.[0 - 25]
Asset 2	Goals.[21 - 25]	Goals.[26 - 30]
Asset 3	Goals.[26+]	Goals.[31+]

At the beginning of each trading round, you will receive an initial endowment of 2000 MU, which partly consists of assets and partly consists of cash. If you spend all your liquid funds or sell all your assets, you are not able to buy or sell any more; i.e. debts or short selling are not permitted. However, in order to obtain liquidity in cash or assets you can use a so called "unit-portfolio", which will be explained in the next paragraph.

Unit-portfolio („Unit-PF")

The unit-portfolio is based on the idea that a full set—consisting of all 3 assets of one event—will always lead to a certain payment of 100 MU. This is independent of the outcome of the uncertain event, since one of the assets will always pay an amount of 100 MU, while the other two assets will expire worthless.

Therefore the person in charge of the experiment changes 100 MU for a complete set of assets at any time during the experiment. This trade takes place via the so called unit-portfolio, which can be bought or sold like the other assets via the trading system. However, the trading partner for this kind of deal is always the person in charge of the experiment and the price is fixed at 100 MU, i.e. it does not depend on bids and asks. In particular it should be clear that this deal does not depend upon the value of a single asset, but the fact that all 3 assets combined represent a certain payment of 100 MU. To clarify this, we return to our example. If you buy one "unit-PF", one asset of each of the available assets is added to your portfolio. Thus, exactly one asset of type SPD.[0-29.9], one asset of SPD.[30.0-34.9] as well as one asset of type SPD.[35.0+] will be added, while your cash balance will be lowered by 100 MU. After the purchase of the „unit-PF", you are able to trade and sell these assets in the market independently.

By selling a "unit-PF", 100 MU will be added to your account, while simultaneously your portfolio will be reduced by one of each type of asset (of course, this sale is only permitted if you own at least one asset of each type). Hence, by using the "unit-PF" you can either acquire liquidity in assets, if you have enough cash or liquidity in cash, as long as you own a positive quantity of all types of assets.

In addition, by using the "unit-PF" you can exploit arbitrage opportunities in the market more directly. Arbitrage means completing a transaction, which results in a sure profit.

Arbitrage opportunity 1. If the market prices for individual assets enable you to purchase a complete set of assets for less than 100 MU, you can obtain a certain profit by buying these 3 assets for less than 100 MU and selling them via the "unit-PF" for 100 MU to the person in charge of the experiment.

Arbitrage opportunity 2. Alternatively, you can obtain a certain profit, if it is possible to sell the 3 assets individually in the market for more than 100 MU. Then you can purchase a complete set of assets via the "unit-PF" for 100 MU and sell them in the market as individual assets for a higher price afterwards.

Such arbitrage opportunities are not excluded by the trading system automatically. Therefore, you should be aware that arbitrage may be possible!

2. How does the trading system work?

> The trading system is a so called continuous double auction, i.e. at any time during the trading round you can act as buyer or seller. After a test trading phase you will trade a total of 6 rounds, each of 10 min. Each scenario appears twice, so you will deal with 3 different scenarios in total.

We will now explain the trading software in detail.

Trading screen

The trading screen is divided into three areas:

1. "Information Area":

    In this area you can find "account info", "session info" and "time info". The "account info" shows information on your cash balance and blocked cash, which will be explained in more detail later on.

2. "Market Area":

    This area gives an overview about the tradable assets, your own portfolio, blocked assets, the recent market price ("current price") and the best (highest) buy and the best (lowest) sell quote. The best buy order (sell order) indicates the volume and the price limit of the

highest buy order (lowest sell order) at present, separated by an "@" symbol. For example, the display "20 @ 10" means, that one or more traders are ready to buy a quantity of 20 assets SPD.[0 - 29.9] at a price of 10 MU each.

3. "Order History":

This area shows all of your orders which are pending or executed (currently there is a quantity of 1 order in the system). By pushing the "delete" button an outstanding order will be deleted. Using the "edit" button means all data regarding this order will be transferred into the "edit form" which subsequently appears.

Order placement

You can place an order by pushing one of the "buy"/"sell" buttons in the market area. Thereupon the "order form" appears:
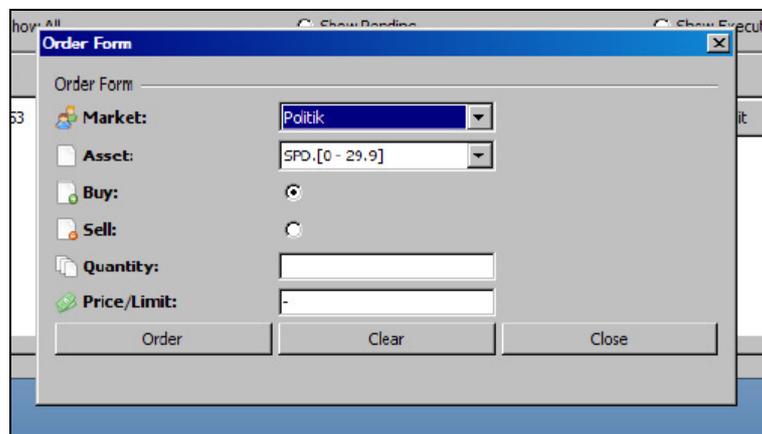
You can complete your order by adding/modifying how many assets you would like to trade and for which price limit. By pushing the "clear" button you will delete all values previously entered, by pushing the "order" button you will confirm your order and it will be processed by the system ("order accepted").

The "order form" remains active until you press the "close" button. While the "order form" is still active you can configure and submit further buy or sell orders.

After confirming your order, it will be processed by the system. When trading, this can last for 1-2 seconds. Your trading screen will be blocked during this time.

Regarding order placement, you should pay particular attention to the following two error messages:

Error "not enough cash" and error "short selling restriction":

These error messages will appear, if you:

1. do not possess enough cash and/or if you have already placed too many active buy orders ("not enough cash"), or, if you

2. do not possess enough assets and/or if you have placed too many active sell orders ("short selling restriction").

This is because any order placed will block your cash or assets until the orders are executed or cancelled. Blocked cash will be shown in the "account info", blocked assets will be displayed in the associated column of the market area. This prevents you from placing orders which cannot be executed. Current orders can be cancelled or edited anytime, in order to access the blocked cash/assets again.

In addition, the error message "*do not trade with yourself*" may occur. This happens if you try to place a buy and a sell order for the same asset simultaneously and if the limit price of the buy order is the same or higher than the limit price of your own sell order.

Order editing and cancelling

Orders not yet executed can be cancelled and edited anytime, in order to do this; pick a current order, which is marked as "pending" in the section "orders", and push one of the related buttons "edit" or "delete" which correspond to this order. "Delete" immediately deletes the order from the system, "edit" removes the order from the system as well, but at the same time inserts the data into the "edit form" that appears:
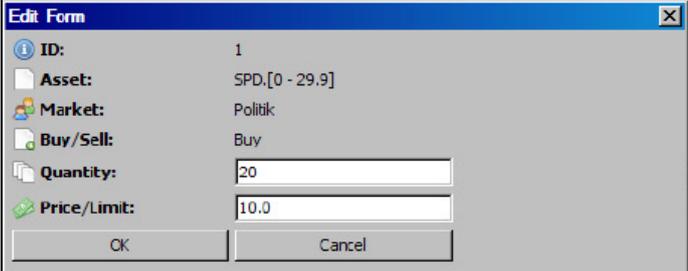
In this "edit form" you can modify the quantity and the limit price of your order. By pressing "OK" the modified order will be placed to the trading system, by pressing "cancel" the original order will be placed to the system again.

Order execution

As previously mentioned, the trading system is based on a continuous double auction. Two orders will be executed against each other simultaneously, only if the buy order has the same or a higher price limit as the corresponding sell order. Please look at the following order book, i.e. the data sheet of current buy and sell orders, which are entered into the system but not yet executed:

buy order	sell order
	1 @ 60 MU
	1 @ 56 MU
	1 @ 50 MU
-none entered-	

Assume you would like to buy assets and enter a buy order "6 @ 80" MU into the trading system, i.e. you are willing to buy a quantity of 6 assets with a price limit of 80 MU each. You definitely know that you are going to buy 1 asset as you can see on your "trading screen" that a quantity of 1 asset is offered at a price of 50 MU in the market (best sell order).

The remaining part of the order book is not visible on the trading screen. Due to the fact that you are willing to pay up to 80 MU per asset, you will buy a quantity of 3 assets in total (see order book).

Important: Your original order quantity of 6 has been split up, so that 3 orders, each consisting of 1 asset, have been completed, while one order of 3 assets remains in the trading system. The price which is shown in the "price" column is your limit price (for the pending order) or the trading price (for the executed orders).

The part of your order which was not yet executed (3 @ 80) now appears as the best buy offer in the order book. Therefore, an amount of 240 MU was blocked and is displayed as "blocked cash" in your "account info".

If two orders can be executed against each other, the transaction will always take place at the price limit of the previously requested buy or sell order (time priority).

3. *How will you be paid?*

To encourage you to carefully think about your decisions, your compensation will be incentive-compatible. This means, your trading performance (as well as a little bit of luck) will determine your payment.

For each experimental group we will randomly select one out of the six trading rounds and use this as the basis for your payment. For this round we will determine the value of your portfolio and add it to your cash balance (to decide which asset will pay 100 MU and which assets will be worthless, we have to wait until the relevant uncertainty (financial markets, weather, sports) is resolved).

> The total value of your portfolio will be divided by 100
> and equals your payment in Euro!

We will inform you by e-mail about how much you earned. At a later date, you will be able to pick up your money from room 263 during office hours (daily 10 till 12) and you will need to bring identification (student ID, identity card, etc.).

Good luck!