1. Risk Management

This report discusses the various forms and levels of risk which currently exist in the Ukraine capital market and how those risks will be managed in the future. This report will set out suggestions for establishing settlement caps for market participants, establishing buy-in and sell-out procedures for failed trades and calculating the level of contribution required by each market participant to a Guarantee Fund.

In general, we are interested in all forms of market risk to the extent that the occurrence of any risk could cause a failure in the clearing and settlement process or a failure in the clearing and settlement process could lead to other forms of risk in the market.

The forms of risk can be defined as systemic risk, principal risk, liquidity risk, and replacement cost risk:

- **Systemic risk** refers to the inability of one market participant to meet its financial obligations causing a cascading effect resulting in other market participants failing to meet their obligations until eventually the entire market is adversely affected. The ability to contain the magnitude of any risk incurred and to limit the impact of the risk to the parties directly involved is critical if systemic risk is to be avoided;
- **Principal risk**, also referred to as counterparty risk, is the risk that the seller of securities will deliver the securities to the buyer and not be paid for the securities, or a buyer will pay for securities and not receive them. "Principal risk in securities clearance and settlement systems is generally recognized to be the largest potential source of systemic risk."[1]
- **Liquidity risk** occurs when a delivery of securities or payment for securities does not happen at the appointed time and the party failing to receive the securities or the funds is forced to make other arrangements (and incur the cost of making these other arrangements) to meet other obligations. "Liquidity problems have the potential to create systemic problems, particularly if they occur at a time when securities prices are changing rapidly and failures to meet obligations when due are more likely to create concerns about the solvency of counterparties."[2]
- **Replacement cost risk**, also referred to as market risk, occurs when it is necessary to buy-in or sell-out securities as a result of, respectively, a failure to deliver securities or a failure to pay for securities that have been delivered. The replacement cost risk occurs when the buy-in or sell-out happens at a price which is different from the original trade or transaction.

2. Multi-lateral Trade Netting & Risk Management

The effective management of the various forms of risk which are inherent within any capital market is essential for the stability and continued growth of that market. The methods used for the clearing and settlement of trades and transactions which occur in the market are a major consideration in the degree of risk to which the market is exposed.

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[1] Delivery Versus Payment in Securities Settlement Systems, Report prepared by the Committee on Payment and Settlement Systems of the central banks of the Group of Ten countries, Basle, September 1992

[2] Ibid

At the present time, clearing and settlement of securities trades and transactions in Ukraine is on a trade-for-trade basis directly between those market participants involved in the trade or transaction. By default, risk is managed at the market participant level. Market participants have traditionally relied on the principle of "know your client" to minimize the risk of loss as a result of a default by a client and the trade-for-trade basis of clearing and settlement has allowed each market participant to assess its counterparty risk on an individual trade basis and to act accordingly. The most prevalent types of risk which occur in this type of trade-for-trade environment are replacement cost risk and liquidity risk.

The introduction of multilateral trade netting will have the effect of interposing a Central Counterparty (CCP) into the middle of all netted trades. Consequently, the CCP is in the position of having to guarantee the settlement of these trades. What it means to "guarantee settlement" is that the CPP must make good on any failure of a market participant to honour outstanding settlement obligations. A central securities depository (CSD) can act as a CCP, or there may be a separate organization charged with this function.

The underlying legal principle which allows netting to take place is called "novation". Novation occurs when the parties to a contract agree to terminate it and substitute a new contract. In effect, the trades which took place on the exchange are replaced with trades between market participants that are net sellers of a security on any one day with market participants that are net buyers of the same security on the same day. Netting substantially improves the efficiency of securities settlement.

However, netting also changes the way in which the market participants need to view the management of risk. Rather than being able to view the incidence of risk as being contained between the market participants to a trade, risk must now be viewed as being spread across the entire market (i.e., spread across all market participants). The reason for this change in outlook towards the management of risk is that market participants can no longer rely upon knowing the counterparty to their trades; the netting process treats all trades in a security as being equal, regardless of the reputation or amount of paid-up capital of the market participants making the trades, and produces a series of "aggregate" trades all of which must settle for the market to remain in balance. The role of the central counterparty in this netting environment is to act as the intermediary between the net sellers of securities and the net buyers of securities and to make sure that all of these "aggregate" trades settle correctly.

3. The Role of the Central Counterparty

It is important to recognize that the risks inherent in capital markets are the responsibility of the market participants. What this means is that whatever losses are incurred in the capital markets will continue to be funded and borne by the market participants. The role of the CCP is to act on behalf of the market participants in minimizing and managing those risks. It is **not** the role of the CCP to absorb risk or in any way substitute for the market participants in bearing the cost of any losses which are incurred. Consequently, the market participants must continue to play a significant role in minimizing and managing risk.

A Guarantee Fund is one mechanism used to protect the CCP from principal risk. The Guarantee Fund is intended to act as a last line of defence in the event that there is a failure to pay on the part of one of the market participants. The mechanics of operating the Guarantee Fund will be described in detail in a later section of this report. Settlement caps and buy-ins are other mechanisms used to protect the CPP from principal risk and these concepts are also discussed in later sections of this report.

The following general principles are relevant to the role that a CCP will play in managing risk on behalf of the market participants:

- the CCP should endeavour to limit its exposure to risk to the level to which it has the resources to cover the risk;
- the risk management measures introduced by the CCP should give equal weight to avoiding the occurrence of risk as recovering from the losses that have occurred;
- as much as possible, the market participants that create risk should bear the responsibility for such risk;
- where possible, alternative risk cover should be sought outside the securities industry (e.g., via insurance coverage) to reduce the burden on the securities industry and to spread the risk across a broader base;
- the Guarantee Fund should only be used by the CPP as a last resort and only in the event that there is a failure by a market participant to pay funds when due.

If the CCP is to be able to guarantee settlement, it must be in a financial position to make good on any defaults in existing settlement obligations. The Guarantee Fund is intended to provide the required source of funds to make good on settlement defaults. Making use of the money in the Guarantee Fund is not considered to be part of the regular operational procedure of the CCP. Before going to the Guarantee Fund, the CCP will make every effort to have the defaulting market participant make good on the default. Only in the event that the market participant will not make good on the default will the CCP look to the Guarantee Fund for reimbursement.

4. Settlement Caps

The term "settlement cap" refers to the maximum exposure that the CCP is prepared to manage for each market participant. The settlement cap should be calculated based on the financial condition of the market participant and, consequently, will be different for each market participant.

Settlement caps should be calculated in the following manner:

- Every market participant will be given a settlement cap equal to their contribution to the Guarantee Fund
- Each security made eligible for the CSD will be given a “margin” value based on market price volatility for that security
- There will also be a market volatility index maintained by the CCP. This index will be based on prevailing market price volatility
- Each day, each unsettled buy trade will be valued. The value will be derived by multiplying the quantity of the trade by the current market price of the security and by the volatility indexes for both the security and the overall market
- This calculated trade value is compared to the original value of the trade and a delta is calculated. Positive deltas are ignored (i.e., the calculated value is greater than the original value). Negative deltas are used to decrease the broker’s settlement cap value. The rationale behind only using negative deltas is that the positive experience relating to the positive deltas in no way offsets the risks posed by the negative deltas. Consequently, the positive deltas should not be factored into the settlement cap equation

- If the settlement cap becomes negative or close to negative the broker is required to provide additional funds to the Guarantee Fund. The broker's settlement cap will be increased upon receipt of the required additional funds. If the additional funds are not received within the required timeframe, it is likely that sanctions will be imposed such as restrictions on trading activity until such time as the exposure of the market to this broker is brought back within acceptable limits

Where a sell trade or transaction cannot be settled against an investor account (i.e., the trade "failed") the market participant's account will show a short position owing to the CCP. This position should be subject to buy-in and the market participant should be subject to a fine based on the value of the failed trade. In addition, the failed trades in the market participant's account will also be marked-to-market and any unfavourable marks must be collected and held until the failed settlement is resolved.

The term "mark-to-market" means that trades are revalued using the latest market price. The difference in value between the value of the trade using the current market value and the value of the trade as it was originally established represents the current level of replacement cost risk that these trades represent to the market. "Unfavourable" marks exist where the market value of the trades is less than the original value. "Favourable" marks exists where the market value is now greater than the original value. The greater the value of the "unfavourable" marks, the greater the risk to the market in the event that there is a failure to pay for the trade.

5. Buy-ins and Sell-outs

The Guarantee Fund exists to ensure that all settlement obligations which involve the CCP are honoured. Where a market participant cannot, or will not, honour its obligations to deliver money and/or securities to the CCP, the CCP must still honour its obligations to those market participants which are owed money or securities from the CCP. Consequently, if a market participant is due to deliver securities to the CCP and fails to do so, the CCP will initiate buy-in procedures against the failing market participant. If the failing market participant refuses to honour the buy-in trade, the CCP must pay for the buy-in. All or part of the buy-in cost will be recovered when the CCP delivers the bought-in securities to the market participant which is due to receive these securities. How much of the buy-in cost of the securities is recovered will depend on which way the market has gone (i.e. up or down) since the original trade was made by the failing broker. It is even possible in theory (although unlikely in practice) that the CCP will make a profit on the buy-in transaction. More typically, there will be a loss equal to the amount by which the price of the security has gone up since the original trade was made by the failing broker. The Guarantee Fund is used to cover the replacement cost risk when there is a refusal of a market participant to deliver securities or to honour the buy-in of the securities which were to be delivered.

Other than the failure to deliver securities, a market participant may refuse to pay the funds which are due as a result of settlement obligations. The CCP will strictly follow the principle of delivery against payment. Consequently, where a market participant cannot, or will not, pay for netted settlement obligations, the CCP will retain control of the securities which should be delivered to the defaulting market participant. However, the market participants that delivered these securities to the CCP have to be paid immediately. The Guarantee Fund will be used to make these payments on the settlement date. The CCP will then attempt to recover the funds expended from the Guarantee Fund. Some of the funds will be recovered by selling out the securities that were not delivered to the defaulting market participant. Any reduction in the price of the securities since the securities were first bought by the defaulting market participant will be a permanent charge against the Guarantee Fund.

A market participant should be subject to buy-in or sell-out on all failed trades. The buy-in or sell-out will be initiated on settlement date + 1 (i.e. T+4) and will be effected on the cash market of the exchange where the original trade took place.

6. Contributions to a Guarantee Fund

The level of contribution to the guarantee fund by a market participant is intended to be commensurate with the risk posed by the market participant. Typically, the level of risk posed by a market participant is directly related to the level of trading and settlement activity by the market participant. However, there should be a minimum amount which must be contributed by all participants to the Guarantee Fund, regardless of the trading and settlement activity of the participant. This is usually set as a minimum percentage of paid-up capital.

Contributions to the Guarantee Fund should be set annually and revised every quarter based on the most recent trading statistics for each market participant. However, on a daily basis, it is important that all trading activity and all settlement activity for every contributor to the Guarantee Fund be carefully monitored. If a market participant is consistently trading outside of the range upon which the contribution to the Guarantee Fund has been calculated, then this will act as a signal for further investigation. The fail rate of all market participants should be constantly monitored. If a market participant is failing on a regular basis, this will be taken as an indication of potential problems and action must be taken to determine the reason for the problems. Similarly, market volatility plays a role in the calculation of the total amount of the Guarantee Fund. If market volatility becomes markedly greater than that which was used to calculate the size of the Guarantee Fund, further action may be required immediately.

The contributions made by market participants to the Guarantee Fund are usually in the form of a minimum amount of cash with the remaining amount being in the form of either collateral (i.e. time deposits, stocks or bonds owned by the market participant) or a bank letter of guarantee issued in favour of the CCP. The CCP will be responsible for calculating the amounts that have to be contributed to the fund and will be responsible for collecting the appropriate amount from each market participant.

The primary objective of the Guarantee Fund is to ensure the orderly, on-going functioning of the market in the event that there is a failure to pay funds by a market participant. Meeting this objective implies that the Guarantee Fund is liquid and can be drawn on at short notice to meet a cash shortfall caused by a defaulting market participant. The composition of the Guarantee Fund comprises various forms of collateral and letters of guarantee. The Guarantee Fund in this form does not provide the level of liquidity required by the CCP in its management of a default by a market participant. Consequently, the CCP must make alternate arrangements to ensure sufficient liquidity of funds in the event of default. The approach used is for the CCP to obtain a line of credit from a bank and to use the Guarantee Fund as collateral for this line of credit. The use of the line of credit is highly restricted to the situation where there is a default of payment by a market participant. As previously stated, it is not the purpose of the Guarantee Fund to provide funds to address day-to-day operational problems which may arise.

7. Calculating Guarantee Fund Contributions

The following example for calculating the level of contributions required by market participants to a Guarantee Fund is based on the method used by the Securities Depository Centre of Jordan. This example has been chosen because it represents a relatively simple formula for establishing contribution levels.

Market participants are required to make the following contributions to the Guarantee Fund:

1. An unconditional bank guarantee, adjusted annually, in the amount calculated below, and
2. A cash contribution, adjusted quarterly, in the amount calculated below. If securities are substituted for cash, then the securities would be "marked-to-market" on a periodic basis and the amount of the cash contribution adjusted accordingly.

The bank guarantee is calculated on the basis of the net amounts due from the market participant for the settlement of trades averaged over a period of twelve months. The amount of bank guarantee required is subject to a minimum which, in Jordan, is expressed as a monetary amount. However, this could also be expressed as a percentage of paid-up capital and we would recommend that a 2% minimum be applied in Ukraine. Trade-for-trade settlements are **not** included in the following calculations.

7.1. Annual Adjustment

The amount of the bank guarantee required from each market participant (G) is calculated as:

$(A \times P) \times S \geq 2\%$ of paid-up capital

Where: "A" is the daily average net amounts due from the market participant over the previous twelve months.

"P" is the percentage of days within the previous twelve months where the market participant had to pay net amounts due for the settlement of trades. To determine this value, divide the number of days that the market participant was due to pay by the total number of trading days in the previous twelve months.

"S" is the settlement period (i.e. T+3)

The amount required in the form of an unconditional bank guarantee, adjusted annually, is the greater of the amount "G" calculated above and 2% of the market participant's paid-up capital.

7.2. Quarterly Adjustment

The amount of cash contribution required by each market participant is calculated as:

$(X \times Y \times S) - G \geq 0$

Where: "X" is the daily average net amounts due from the market participant over the previous three months

"Y" is the percentage of days within the previous three months where the market participant had to pay net amounts due for the settlement of trades. To determine this value, divide the number of days that the market participant was due to pay by the total number of trading days in the previous three months.

"S" is the settlement period (i.e. T+3)

"G" is the amount of the bank guarantee calculated in the first step.

Negative adjustments should be ignored in the case of the quarterly calculation.

The amount of the bank guarantee and the cash contribution derived from these formulas would represent the market participant's required contribution to the Guarantee Fund and the market participant's Settlement Cap.