

# Selling Toxic Assets in Ukraine. Overview of the Current Situation and Suggestions for Improvement of the Auction Design

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## **Abstract/Introduction**

As of June 19, 2017, ProZorro.sale, an electronic platform to sell public and communal assets, has sold assets and loans for UAH 1.2 bln since October, 31 2016. It has been deployed mainly by the Deposit Guarantee Fund to facilitate the liquidation of insolvent banks. The platform will soon extend its portfolio to cover all the disposed assets in the public sector. A major problem is that only a tiny share of all assets offered through the auctions on the platform are sold. The unsold assets languish without a (private) owner. The empirical evidence suggests that the primary reason for a small volume of trade is high starting prices in the auctions and the lack of competition. In this memorandum, we discuss ways to improve the auction rules to increase efficiency and revenue of the platform. We suggest that a modified Dutch with a final sealed bid stage can increase efficiency and the revenue of the Fund.

## Introduction

A good auction design must do well along three dimensions. First, it should allocate the object for sale efficiently, to the bidder whose (social or economic) value of the object is largest. Second, it should generate high revenues for the seller. Third, it should allow for price discovery so that the markets can learn the true value of the assets. All three require sufficient competition which is difficult to achieve in the case of toxic assets. The number of bidders with deep pockets and able to carefully value the asset being sold is limited. Encouraging competition requires attracting bidders who are weak and less informed. However, they have no incentive to participate unless there is a plausible chance of winning the auction and making a profit. This is only possible if the good is *not* always sold to the stronger, more informed bidder. So, a balance must be struck between efficiency, revenue and the desire for more competition.

This memorandum proposes an auction design for selling assets owned by the Deposit Guarantee Fund that will strike such a balance. Currently, the fund sells the assets through a sequence of hybrid auctions, called Prozorro.Sale, which implements a descending clock Dutch auction. There are very few sales, the objects stay on the market for a long time, and the prices, as a consequence, are depressed. The present auction design favors the bidders with insider information about the value of assets, discouraging entry by outsiders. As a result, there is no competition (average number of bidders in completed auctions is 2.6) Furthermore, efficiency properties of the auction structure might also be weak.

In this memorandum, we propose a different auction format that will overcome flaws of the current auctions. It consists of three stage. In the first stage, a descending clock auction is deployed. The second stage starts after the clock stops. At this stage, bidders submit, if they wish, sealed-bids above the stopping price of the clock stage. Finally, in the third stage, the winner of the clock stage is informed about the magnitude of the sealed bids and is given a chance to submit a bid at least 10% higher than the highest sealed bid. The winner gets the object and pays his bid. We argue below why this auction format is suitable for the sale of toxic assets in Ukraine.

## Current State of Sale of Toxic Assets

Between 2014-2017, the National Bank of Ukraine declared 88 banks to be insolvent. By law, the assets of these banks were transferred to the Deposits Guarantee Fund (DGF) of

Ukraine. The Fund is required to liquidate these assets by selling (privatizing) them in the open market.

The amount of assets to be sold is enormous. The total balance value of the assets is about 20% of the nominal GDP of Ukraine in 2016. However, the market value of the assets is likely to be substantively lower than the balance value. As of April, 2017, the estimated value of the banks' assets, calculated by the independent appraisers hired by the DGF, constitutes on average only 20% of the balance value – UAH 97 bln of UAH 471 bln.

The Fund plans to dispose of these assets over the next two years.<sup>1</sup> To fulfill this target, between November, 2016 and April, 2017, the DGF launched 21,917 auctions for UAH 66.2 bln on a single electronic auction platform, ProZorro.sale. In general, participation in these auctions is open to any established company that has been operating in financial markets. There are some restrictions to discourage frivolous and shill bidders. The true effect of those restrictions remains an open question.

The assets are essentially of two types: loans issued by the banks and the collateral on loans that have not been serviced and that now belong to the Fund. The value of assets is highly uncertain. For example, some loans might be much more likely to be serviced than others, while the property rights of the Fund over the collateral might be more secure for some assets than for others. Furthermore, some of the assets submitted as collateral might be lemons, while others might be peaches.

Furthermore, the distribution of information about the value of assets is highly uneven among the market participants. There two types of insiders: (1) individuals who had access to information of the credit risk assessment and related departments at the banks that held the assets and (2) individuals and companies that took out loans and submitted assets as the collateral. The insiders might also have lower costs of securing the property rights over the assets if they win the auction (better understanding of legal risks, specific knowledge about how to use the assets, prior experience dealing with courts in regards to the assets, etc).

The Fund has a two-pronged objective. It would like to liquidate the assets as soon as possible. The Fund has not explicitly declared that the objective is to allocating the assets efficiently, i.e., to bidder with the highest economic value. Nonetheless, first-

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<sup>1</sup> [Decision #388 of the Executive Management of the Deposit Guarantee Fund as of 24.03.2016](#)

order efficiency considerations are embedded in the objective to sell assets quickly. Since un-serviced assets tend to depreciate in value, efficiency dictates speedy sale of the assets. At the same time, the Fund seeks to increase competition at the auctions in order to increase the price at which the assets are sold.

Both of these objectives are currently not met. Only 2% of all auctions result in a successful sale. In most of the successful auctions, it appears that there is one serious bidder and one shill bidder. (The law requires that at least two bidders be present in order for an auction to start. Thus, a lone insider has an incentive to bring along a shill bidder who will lose, in order to satisfy the two bidder requirement.) Only 20% of the auctions have 3 or more participants.

The current rules require the Fund to set the reserve prices at the level estimated by the bank liquidators. This makes the reserve price too high and most of the auctions result in no sale. After an unsuccessful sale, the Fund can decrease the starting price by 10% and put the asset on the market through the auction again, after a cooling off period of two weeks. In practice, it takes four or more weeks, because of capacity constraints and, occasional political reasons. The Fund is allowed to decrease the starting price by 10% and run a new auction three more times. If the asset is not sold, the Fund can re-evaluate the asset and start the series of auctions again. Thus, the minimal reserve prices can be .3 of the nominal value of assets after seven unsuccessful auctions. After that, if the asset is not sold, the Fund can, in principle lower the price further. This requires a lengthy approval process.

Most of the assets are sold only after several decreases of the prices, which creates inefficiency. Furthermore, there is typically only one serious bidder (see appendix for the stylized facts). De facto, the sequence of Prozorro.Sale auctions implements a slow descending clock Dutch auction, where the price drops decrements of 10% and a substantive delay, where new bidders can enter at any stage.

The descending clock auction suffers from severe winner's curse. Indeed, if an uninformed outsider decides to bid in this auction and wins, it means that the owner of the asset or another insider has decided not to participate or placed a lower bid. Both of these are bad news, implying that the outsider has bid excessively high given the information of the insiders. This effect creates incentives for the outside bidders to bid low or not to participate in the auction. In turn, the insiders can now also bid lower as they face less competition.

## Proposed Auction Format

The Fund proposes to move to a fast descending clock Dutch auction, where the clock runs down from 100% to 0% in 1% decrements within one working day. Such an auction will be close or equivalent to the outcome of the sequence of Prozorro.Sale auctions with decreasing starting prices. Indeed, as we show in the appendix, most of the assets are sold after several decreases of the starting price to one serious bidder who does not face any competition.

Of course, the proposed auction will consume one day instead of several months, increasing efficiency of allocation by saving on depreciation of assets.

This standard descending clock does not, however, resolve the winner's curse problem described above. The winner is likely to be an insider. As the outsiders are unsure about the value of the assets they will bid conservatively, if they participate at all.

Furthermore, they will know that they can only win by stopping the clock. And when they do, it means that an insider is absent (bad news, he is not interested in buying the asset) or is unwilling to stop the clock at this price (bad news, he thinks the asset is less valuable). This will further suppress participation and bids of the outsiders. As a result, the insider will be likely to win at relatively low prices. So, the Dutch auction, while speedier than selling the assets through a sequence of Prozorro.Sale, will not attract sufficient competition and depress revenues.

To overcome the winner's curse, we allow for one additional round of bids after the Dutch auction stops. The bidders, including relatively uninformed outsiders, will observe the stopping bid and will be able to update their estimates about the value of the asset. After that, they can place one sealed-bid above the stopping bid. This will allow for an outsider to learn some good information about the value of the asset in the auction. The sealed-bid nature of this last round will give some advantage to weak (outside) bidders and drive prices up.

In addition, we need to provide incentives for an (informed) bidder to stop the clock. This can be done by giving him the right to make the last and final bid, if he is so willing, after observing the sealed bids of others. However, to avoid re-introducing a substantive winner's curse back, there should be a requirement that in order to win, the last and final bid should be 10% above the highest sealed-bid. Of course, the specific

value of the difference has to be estimated empirically, but it should be different from 0.

## Appendix. Stylized Facts in ProZorro.Sale Auctions

- I. Only 2% of tenders lead to contract. Success rate of the tenders is low independent of the item type and price category. Only industrial machinery and transport have higher success rates.
- II. 15,261 (70%) auctioned items were not sold even after several iterations, 2,472 (11% of all) were not sold even from 4<sup>th</sup> attempt with 30% discount (maximum discount possible, according to the legislation).
- III. Only 20% of all auctions and 22% of completed auctions experience competition of 3 or more bidders.
- IV. 2% of tenders which led to the contract, show an average increase of price of 10% (drown by a 4 cases of > than 50% increase) and median increase of 3%.
- V. With 80% of all the tenders being run with 2 bidders, in 67% of these cases, the would-be-loser seems to come to lose, not to win.

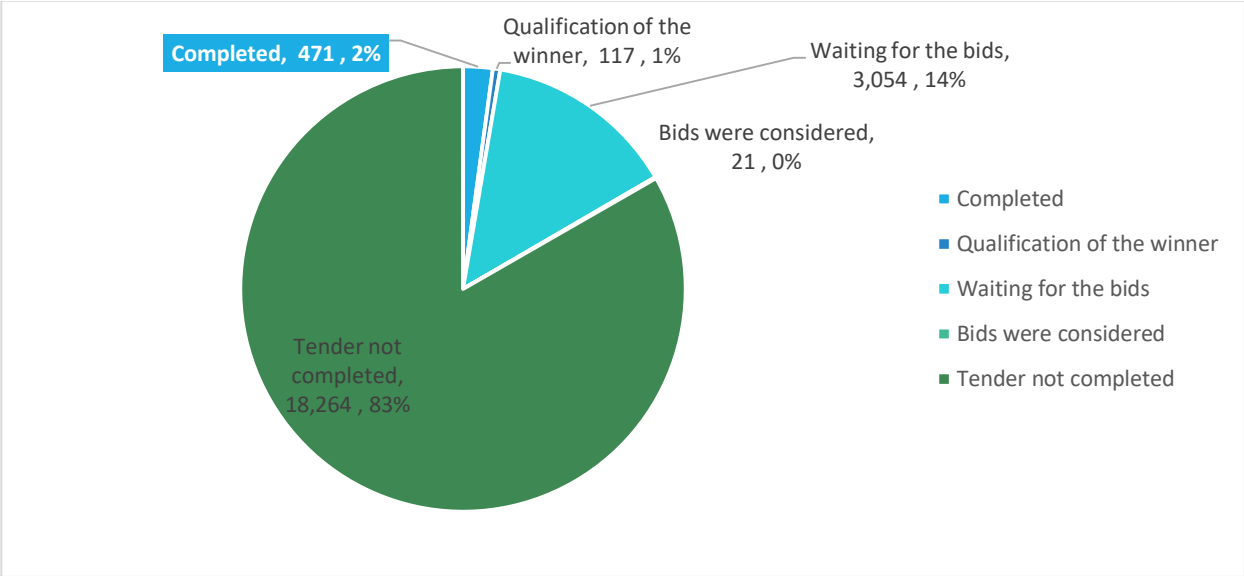
High proportion of the tenders with two bidders, where the would-be-loser bids in a way that he can not win, suggests, that it is very likely, that it is frequent that actual borrowers/owners of the collateral are coming to the tenders to buy out their loan, and taking shield bidder with them to ensure that tenders takes place.

### I. Low share of completed tenders

**Out of more than 21K tenders, only 2% lead to the contract, 83% were cancelled due to the lack of bidders (Figure 1).** Over the study period, 1 658 bidders participated in 639 auctions for UAH 774.4 mln. 471 (74%) of completed auctions led to the contract (total value UAH 521.7 mln). 29 tenders for approx 18.9 mln were back cancelled, 44 auctions for 147.5 mln didn't lead to the contract; the rest (86.3 mln) are still awaiting for the final status. **Success rate of the tenders is low independent of the type the item sold and price category.**

*Figure 1. Distribution of ProZorro.sale tenders by status, 31.10.2016 – 30.04.2017*





Most of the items have a success rate of the tenders around 2-3%. (*Complete table with all the numbers is in the end of the file, Annex 1*). Only in the case of industrial machinery and transport, the ration of competed to not completed tenders is 1 to 4.

There is not much variation in completion rate depending on the reserve price (Table 1). However, in absolute terms, majority of the completed tenders fall into the category of tenders with the reserve price less than 1 mln (380) or between 1 mln and 3 mln (57). Only five tenders out of 792 with the reserve price higher than 10 mln were completed.

Table 1. Tenders completion rate depending on the reserve price

Reserve price range, UAH	Completed	Tender not completed	Completed and Not completed
0-1 mln	380	3% 14263	97% 14,643
1 mln-3 mln	57	3% 2179	97% 2,236
3 mln-7 mln	20	2% 823	98% 843
7 mln-10 mln	9	4% 207	96% 216
10 mln-50 mln	4	1% 632	99% 636
50 mln-100 mln	1	1% 68	99% 69
100 mln +		0% 92	100% 92
<b>Grand Total</b>	<b>471</b>	<b>3% 18264</b>	<b>97% 18,735</b>

**II. High proportion of the lots that are sold after 2 or more iterations, or not sold even after 4 iterations**

15,261 (70%) auctioned items were not sold even after several iterations, 2,472 (11% of all) were not sold even from 4<sup>th</sup> attempt (Table 2) with 30% discount (maximum discount possible, according to the legislation).

Table 2. Status of the tender by the order of the auction (how many times the item is being auctioned by now)

Status of the tender	Order of the auction for this item					Grand Total
	-	1	2	3	4	
Completed	125	129	86	39	92	471
Qualification of the winner	10	32	23	29	23	117
Waiting for the bids	225	688	809	508	824	3,054
Bids were considered	3	7	3	4	4	21
Tender not competed	3,003	4,955	4,524	3,310	2,472	18,264
<b>Grand Total</b>	<b>3,366</b>	<b>5,811</b>	<b>5,445</b>	<b>3,890</b>	<b>3,415</b>	<b>21,927</b>

### III. Low competition on the tenders

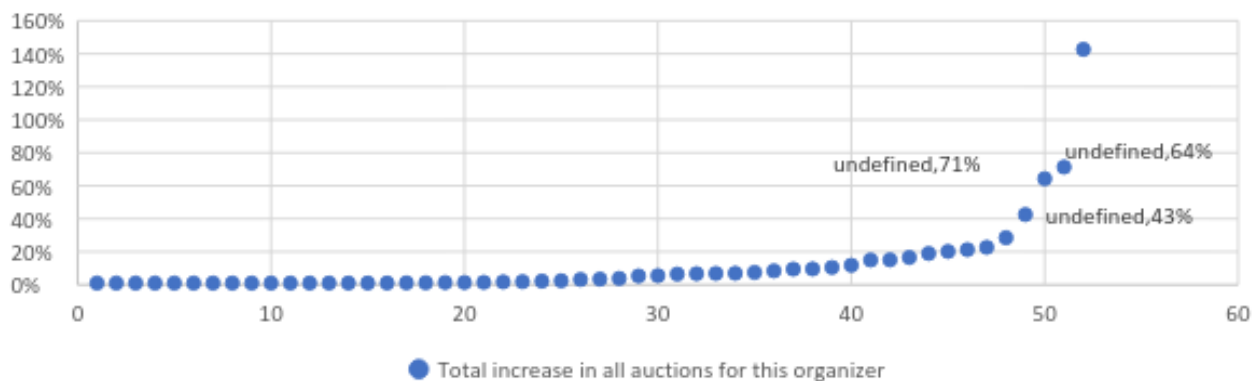
Tenders are frequently cancelled being able to attract only one, or zero bidders, (18,264 tenders or 83% of all) with the law requiring for the tender to have at least 2 bidders to be valid. **Only 20% of all auctions and 22% of completed auctions experience competition of 3 or more bidders.** In particular:

- In 80% of all auctions, there are only 2 bidders. In 13.6% there are 3-4 bidders.
- In 78% of completed auctions (the contract was signed), there are 2 bidders. In 14% there are 3-4 bidders.
- In 82% of cancelled auction, there were 2 bidders (14 out of 17)

### IV. Sluggish bidding

**Those 2% of tenders which led to the contract, show an average increase of price of 10% (drown by a 4 cases of > than 50% increase) and median increase of 3%.** That is, in November, 2016 - April, 2017, difference between contracted value and reserve price constitutes UAH 46.3 mln (521.6 mln - 475.3 mln). For 21 out of 52 organizers of the tenders, total increase for all their sales constituted 1%.

Figure 2. Total increase of price in the auction for all the items sold, by organizer (insolvent bank)



In fact, only 2 banks sold more than 2% of the assets/loans put for auctions – Expobank («Експобанк»; 61.6%, contract value – UAH 2.3 bln), and Interbank (“Інтербанк”; 50%, UAH 2.1 bln).

#### V. High proportion of bidders who follow strategy destined to lose

In every round, bidders have a few options: they either raise their bid, or hold it; either win the round or lose it. We grouped all the bidders' strategies according to their behavior in all the rounds.

\*R- raise, H-hold, D-Drop; Rise can be S,r,R: S-making an obligatory step, r-making a rise smaller than an obligatory step, R- making a raise higher than a step;

\*M- the bidder is the winner in this round with the Maximum bid, N-not the winner;

8 strategies constitute 88% of the sample. Same strategies constitute 89% of winning bids

- In 17% bidders don't change their bid, sticking to the announced reserve price
- In 44% (15.92+14.96+13.33) cases, the bidder makes a rising step once, either in the first or second round. In 15% cases, the bidder drops in the first round after the rise in the blind and then holds in the 2nd and 3rd
- Some strategies result in losing the tender in 100% cases: RDHH, RDRH, DDHH, DDDR. They were used in 265 tenders
- Strategy which is used most frequently by the winners - HRHH - 34%. Then follows RHHH (24%), RRHH(14% of winners), RRRR (9%), HRRR(5%)

Table 3. Eight most frequently used Hold-Rise strategies

Strategy (Rise or Hold)	Freq.	Percent	Looser	% of the strategy	of losers	Winner	% of the strategy2	of winners
HHHH	284	17%	268	94%	27%	16	6%	2%
HRHH	254	15%	31	12%	3%	223	88%	34%
RDHH	250	15%	250	100%	25%	0	0%	0%
RHHH	224	14%	67	30%	7%	157	70%	24%
RRHH	166	10%	74	45%	7%	92	55%	14%
RRRR	147	9%	87	59%	9%	60	41%	9%
HRRR	69	4%	35	51%	4%	34	49%	5%
RRRH	60	4%	52	87%	5%	8	13%	1%

With 80% of all the tenders being run with 2 bidders, in 67% of these cases, auction follows one of 8 possible scenarios. In all these cases, the would-be-loser uses strategy which is not aimed at winning. Loser strategies look like strategies designed to lose.

Table 4. Combination of bidder and loser strategies

Group	Pair (Winner and Loser)	Pair (Winner and Loser)	Frequency	%
12	MMMM Mnnn	HSHH HHHH	79	15.58
17	MMMM nnnn	RHHH HHHH	68	13.41
56	nMMM Mnnn	HRHH RDHH	58	11.44
62	nMMM Mnnn	HSHH SDHH	50	9.86
33	MMMM nnnn	SHHH HHHH	40	7.89
23	MMMM nnnn	RHHH rHHH	19	3.75
8	MMMM Mnnn	HRHH HHHH	15	2.96
74	nMMM Mnnn	rRHH RDHH	12	2.37

Annex 2. Success rate of the tenders

Table 5. Success rate of tenders by type of item auctioned

Row Labels	Completed tender	Qualification of the winner	Waiting for the bids	Bids were considered	Tender not completed	Grand Total
<b>Assets</b>						
Assets on the balance sheet			5		23	28
Property on the balance sheet	2		14		29	45
ATM (cash machine)	2	1	162		2,511	2,676
Charity			1			1
Buildings	3	1	4		38	46
Land	13	4	200	2	695	914
Kiosks					471	471
Banknotes counters and packers	1	2	3		20	26
Property complex	1		7		31	39
Property rights	9	4	48		297	358
Furniture	3		8		156	167
Scrap		5	1		2	8
Real Estate	38	13	89	4	761	905
Fixed assets (?)					42	42
Fixed assets	33	5	356	5	2,704	3,103
Office and computer equipment	24	1	17		393	435
Commemorative coins					58	58
Industrial machinery	1			1	3	5
Radio-,Telecom					41	41
Various	11	3	85		455	554
Safe			22		318	340
Banknotes sorter	6	12	5		85	108
Terminals, etc			4		9	13
Material assets	1		26		47	74
Transport	42	6	24	1	142	215
Premises suitable for craftsmanship (Hex?)					7	7
<b>Rights to claim/loans/receivables</b>						
Receivables		1	6		71	78
Receivables, loans portfolio					5	5
Receivables, loans					8	8
Loans portfolio			25		94	119
Loans (with and w/o guarantees(zastava))	281	59	1,942	8	8,748	11,038
<b>Grand Total</b>	<b>471</b>	<b>117</b>	<b>3,054</b>	<b>21</b>	<b>18,264</b>	<b>21,927</b>

Table 6. Ration of completed to not completed tenders by type of item auctioned.

Row Labels	Completed tender	Tender not completed	Grand Total
<b>Assets</b>	<b>2%</b>	<b>98%</b>	<b>100%</b>
Assets on the balance sheet	0%	100%	100%
Property on the balance sheet	6%	94%	100%
ATM (cash machine)	0%	100%	100%
Buildings	7%	93%	100%
Land	2%	98%	100%
Kiosks	0%	100%	100%
Banknotes counters and packers	5%	95%	100%
Property complex	3%	97%	100%
Property rights	3%	97%	100%
Furniture	2%	98%	100%
Scrap	0%	100%	100%
Real Estate	5%	95%	100%
Fixed assets (?)	0%	100%	100%
Fixed assets	1%	99%	100%
Office and computer equipment	6%	94%	100%
Commemorative coins	0%	100%	100%
<b>Industrial machinery</b>	<b>25%</b>	<b>75%</b>	<b>100%</b>
Radio-,Telecom	0%	100%	100%
Various	2%	98%	100%
Safe	0%	100%	100%
Banknotes sorter	7%	93%	100%
Terminals, etc	0%	100%	100%
Material assets	2%	98%	100%
<b>Transport</b>	<b>23%</b>	<b>77%</b>	<b>100%</b>
Premises suitable for craftsmanship (Цех?)	0%	100%	100%
<b>Rights to claim/loans/receivables</b>	<b>3%</b>	<b>97%</b>	<b>100%</b>
Receivables	0%	100%	100%
Receivables, loans portfolio	0%	100%	100%
Receivables, loans	0%	100%	100%
Loans portfolio	0%	100%	100%
Loans (with and w/o guarantees(zastava))	3%	97%	100%
<b>Grand Total</b>	<b>3%</b>	<b>97%</b>	<b>100%</b>

Strategy (Rise or Hold)	Freq.	Percent	Cum.	Looser	% of the strategy	of losers	Winner	% of the strategy 2	of winners
HHHH	290	17.49	19.24	290	100%	25%	0	0%	0%
HRHH	264	15.92	37.45	76	29%	7%	188	71%	38%
RDHH	248	14.96	58.99	248	100%	21%	0	0%	0%
RHHH	221	13.33	75.03	106	48%	9%	115	52%	23%
RRHH	155	9.35	86.07	94	61%	8%	61	39%	12%
RRRR	144	8.69	100	99	69%	8%	45	31%	9%
HRRR	72	4.34	44.03	44	61%	4%	28	39%	6%
RRRH	58	3.5	91.31	51	88%	4%	7	12%	1%
RRHR	29	1.75	87.82	22	76%	2%	7	24%	1%
HRRH	20	1.21	39.69	18	90%	2%	2	10%	0%
RDHR	20	1.21	60.19	17	85%	1%	3	15%	1%
HHRH	17	1.03	21.05	6	35%	1%	11	65%	2%
HRHR	17	1.03	38.48	12	71%	1%	5	29%	1%
RDRR	16	0.97	61.7	12	75%	1%	4	25%	1%
HHHR	13	0.78	20.02	4	31%	0%	9	69%	2%
DHHH	11	0.66	0.9	11	100%	1%	0	0%	0%
RHRH	11	0.66	76.12	7	64%	1%	4	36%	1%
RHRR	10	0.6	76.72	8	80%	1%	2	20%	0%
RDRH	9	0.54	60.74	9	100%	1%	0	0%	0%
DRRR	8	0.48	1.75	8	100%	1%	0	0%	0%
HHRR	8	0.48	21.53	6	75%	1%	2	25%	0%
RHHR	7	0.42	75.45	7	100%	1%	0	0%	0%
DRHH	6	0.36	1.27	6	100%	1%	0	0%	0%

DDHH	2	0.12	0.12	2	100%	0%	0	0%	0%
DDRR	2	0.12	0.24	2	100%	0%	0	0%	0%
Total	1,658	100		1165	70%	100%	493	30%	100%



