

ORIGINAL RESEARCH

RELATION OF EFFECTIVENESS IN PICK N' ROLL APPLICATION BETWEEN THE  
NATIONAL GREEK TEAM OF AND ITS OPPONENTS DURING THE MEN'S WORLD  
BASKETBALL CHAMPIONSHIP OF 2006

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Abstract

The purpose of this study was to register and analyse the alterations of Pick n' Roll effectiveness between the national team of Greece and its opponents during the Mundobasket 2006 in Japan. The sample consisted of the 9 games that took place between them during the Mundobasket 2006. In the 1528 cases which were registered, we analyzed all the Pick n' Rolls according to 26 pre-estimated factors (form, court area, players combination, way of attack, attack player, shot area, way of defending Pick n' Roll), to reveal all the comparing differences in the Pick n' Roll application and the relation of Pick n' Roll effectiveness and productivity. The statistical analysis package SPSS was used for the statistical analysis of the data, correlation analysis, classification (cluster) and Crosstabs command with  $\chi^2$  (Chi-square) test. The results of the Crosstab analysis, revealed that there are statistically significant differences between the Greek and the other National Teams according to the use of Pick n' Roll move in the offensive set plays and also according the offence efficacy and offence productivity. The Correlation analysis revealed extremely high interrelation between offence efficacy and shot area ( $p=-0,209^{***}$ ,  $\alpha=0,01$ ), and as far as offence productivity is concerned extremely high interrelation revealed first of all with the final shot player and secondly with the shot area ( $p=-0,2877^{**}$ ,  $\alpha=0,01$ ). According to the Cluster analysis the results revealed that as far as both offence efficacy and offence productivity are concerned the maximum similarity is modulating in relation with the Pick n' Roll form.

**Keywords:** Basketball, Pick n' Roll, video analysis

Introduction

Basketball is characterized as one of the richest and most complicated, as far as the area of tactics are concerned, because during the duration of a game many different situations are presented as much for defense as for offense (Anastasiadis, 1995). In 2000 FIBA changed the rules of basketball in Europe, their aim being to spot the offense more quickly so as to increase the spectacularity of the game in order to increase television ratings and attract sponsors. In this way, the time allowed for offense was reduced from 10" to 8" seconds, and the maximum time allowed from the start of the offense until shooting the ball was reduced from 30" to 24" seconds.

These changes in combination with the continuous improvement of defensive tactics significantly differentiated the way the offense was expressed. In this way, a big part of this, independent of the offensive tactics that follow, end in one on one situations and Pick n' Roll, which consists of the most common cooperation between two players with a ball, and this is why the defense in the two above mentioned situations is so important (Ratberger, 2004). The first responsibility of a player is to create a situation where he can make a pass to a team-mate for a shot in the hoop area or the outside. (Krause, 1991; Kunstadr, 1994; Miller, 1994). That's why, the Pick n' Roll is a great offensive weapon, used by all the teams of the NBA, and is one of the hardest offensive actions to face that teams are called on to stop. Pick-and-rolls are run in transition as drags and step-ups. They are run on the half court on the side, in the middle of the floor and off the elbow. The picks can be stationary or off movement, and they can be set plays or random actions. As you can see, Pick n' Roll plays

can cause a strategic nightmare for coaches just in looking at the numerous actions that a team can present. Now, add to the mix the great players involved, and you further complicate matters” (Ociepka, 2004).

Coaches all around the world independently of their offensive or defensive philosophy adopt a common ground in their goal to beat their opponent at any cost. For this purpose, they use tactics applied to the individual characteristics of the players whom they coach. “Many coaches with an aggressive philosophy, based on pick n’ roll to help their players increase their opportunities to score with an easy basket”. (Filipovski, 2005).

There are no scientific studies regarding the Pick n’ Roll offensive action in the international references, except those which refer to its appearance frequency according to the total number of attacks. On the other hand the references of great coaches from all over the world as pertains the way of application, the players combination, the offensive opportunities created from the Pick n’ Roll action as well as the ways how to defend Pick n’ Roll, are numerous.

Karl (2003) and Kruger (2007) mention the percentage of using Pick n’ Roll as well in the NBA as in Europe determining the importance that many coaches, around the world, pay for this offensive move. Karl (2003), Yannakis (2006) and Filipovski (2005) explain the reasons and the purposes of the application of this offensive move, emphasizing the creation mismatch within the involved players. Katsikaris (2006) and Ociepca (2004) present the most applicable section of the court and the most prevalent ways defending the Pick n’ Roll. Harris (2007) mentioning the ways defending Pick n’ Roll, detects the increase of the defense efficacy, that the switch offers, during the last seconds of the offence. Winter (1997) explains and analyzes the effectiveness of the offensive triangles created during the Pick n’ Roll application within the involving players and those who spot up in the peripheral area.

In conclusion, Torbert (2004) refers that the attack from the low post offers the attacker, not only the high percentage of shot but also the opportunity of free throws plus the damage of the opponent team which results from the personal fouls.

### **Purpose**

The purpose of this research was to record and analyze the different appearances of Pick n’ Roll as well as the relation of its efficacy between the national team of Greece and its opposing teams during the men’s World Basketball Championship which took place in Japan in 2006, in order to determinate which is the factor that makes the difference between them and maximize the effectiveness of Pick n’ Roll of the Greek offense.

### **Method and process**

The study comprised all the games between the national teams of Greece and it’s opponents, not only during the preliminary round but also during the semifinal and final rounds of the championship. Most specifically video analysis was performed in 9 games of the Greek National Team during this Champion ship (Greece - Qatar, Greece - Lithuania, Greece - Australia, Greece- Brazil, Greece - Turkey, Greece - China, Greece - France, Greece - USA και Greece – Spain) which were recorded from the international broadcasting sports channels.

### **Instruments collecting data**

The instruments used for the completion of the research were the following:

Video JVC HR-D521EM for the recording of the game, DVD Recorder LG HDMI 10801 Up conversion connected with a computer for the input of the samples for counting, Sony television Trinitron KV-2553 MT for the reproduction of the games, computer with 2GB RAM memory which was equipped with the video analyzing program Pinnacle Studio Plus 700 USB (10.5 Titanium Edition) and one external hard drive WD250 GB on which footages of the plays to be analyzed were stored.

The analyzed factors were: a) method of offense[1<sup>st</sup>-2<sup>nd</sup> fast breaks, 2<sup>nd</sup> fast break with Pick n’ Roll, Set Plays that ended with Pick n’ Roll, Set Plays that contained Pick n’ Roll, Set Plays without Pick n’ Roll, transitions] b) the type of Pick n’ Roll [simple, double high, pick n’ pop, Pick and Re-pick] c) the section of the court that the Pick n’ Roll was performed [high, elbow, side] d) the combination of players involved, e) the type of offense displayed, f) the player of attack, g) the section of the court that the shot was performed, h) the effectiveness of the attack [positive-negative] i) the productivity in points, the type of defense and the section of court it was performed in, the way Pick n’ Roll, and j) all the unique cases.

### **Statistical analysis**

For the statistical analysis the statistic package SPSS 13 was used. On the first level, control of homogeneity and independence (t-test  $\chi^2$ ) was performed, where the differences between the two teams were explored according to the parameters examinable. On the second level we transformed the Cluster Hierarchical analysis between the main variables using the Ward method, where the Euclidean area and degree of homogeneity is analyzed. We chose the Ward method because it fashions the process of choosing between two groups (Clusters). For all that statistical analyses that were performed the level of significance was define to  $p < 0,05$ .

## Results

The Crosstab Analysis had the following results: In a total of 1528 detected phases 215 were fast breaks, 1151 set plays and 162 transitions. In more details, were detected 171 1<sup>st</sup> fast breaks (11, 2%), 44 2<sup>nd</sup> fast breaks (2, 9%), 416 set plays that ended with Pick n' Roll (27, 2%), 72 set plays that included Pick n' Roll (4, 7%), 664 set plays without Pick n' Roll (43, 4%) and 164 transitions (10, 7%). These results show that in a total of 1528 detected offenses, 488 included Pick n' Roll (31,93%) while in a total of 1152 set plays, the percentage of using Pick n' Roll was 42,36%.

Chi Square analysis revealed statistically significant differences ( $\chi^2_{(6)}=26,177, p<0,05$ ) regarding the type of offensive play between the Greek team and its opponents. The Greek team executed: 92 1<sup>st</sup> fast breaks (12,1%), 19 2<sup>nd</sup> fast breaks (2,5%), 227 set plays that ended with Pick n' Roll (29,9%), 46 set plays that included Pick n' Roll (6,1%), 315 set plays without Pick n' Roll (41,6%) and 59 transitions (7,7%). On the other hand the Greek opponents had: 79 1<sup>st</sup> fast breaks (10,2%), 25 2<sup>nd</sup> fast breaks (3,2%), 189 set plays that ended with Pick n' Roll (24,4%), 26 set plays that included Pick n' Roll (3,4%), 350 set plays without Pick n' Roll (45,2%) and 105 transitions (13,5%).

Statistically significant differences were observed ( $\chi^2_{(4)}=24,040, p<0,05$ ) between the Greek team and its opponents according to the section of the court that the Pick n' Roll was performed. (Table 1.) As well, from a total number of 532 Pick n' Rolls the Greek team executed the 295 (55,5%) 5 of which were performed on the Side Right court area (1,7%), 6 on the Side Left court area (2%), 60 on the Elbow Right court area (20,3%), 61 on Elbow Left court area (20,7%) και 163 on the High court area (55,5%).

On the other hand the Greek opponents executed 237 Pick n' Rolls (44,5%) which 9 of them were performed on the Side Right court area (3,8%), 12 on the Side Left court area (5,1%), 61 on the Elbow Right court area (25,7%), 72 on the Elbow Left court area (30,4%) and 83 on the top of the key [ High] (35%). We observe that the Greek team showed a preference for the High court area in higher percentage respectively to its opponents (66,3% against 33,7%, respectively).

**Table 1.** Team of attack \* Court area that the Pick n' Roll was performed

			Court area that the Pick n' Roll was performed					Total
			Side Right	Side Left	Elbow Right	Elbow Left	High	
Team of	Greece	N	1,7%	2%	20,3%	20,7%	55,5%	55,5%
	Opponent	N	3,8%	5,1%	25,7%	30,4%	35%	44,5%
Total		Count	2,6%	3,3%	22,7%	25%	46,2%	100,0%

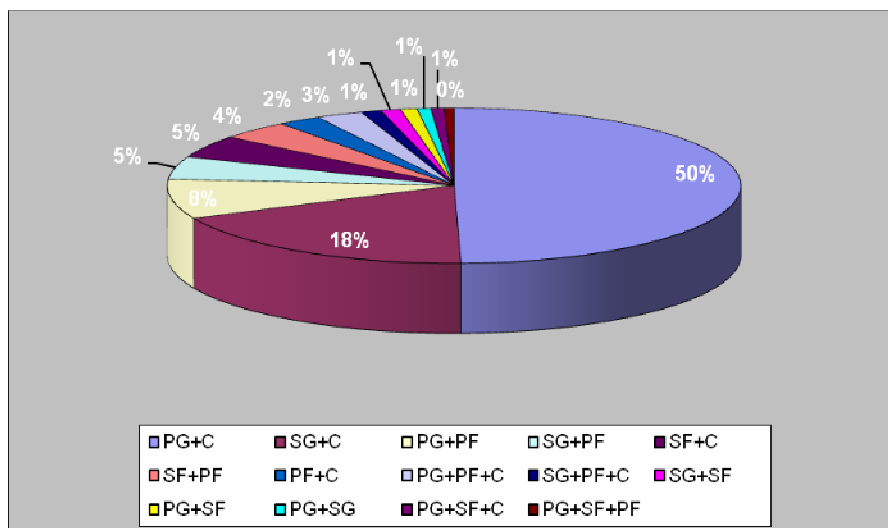
According to the Pick n' Roll form, statistically significant differences between Greece and its opponents were observed ( $\chi^2=0,649, df=3, p<0,05$ ), showing that the Greek team executed more than the double number of Double High (74,1%, against 25,9%), double number of pop outs (66,7% against 33,3%) and quadruple number of pick and re-picks (81,3% against 18,8%) respectively to its opponents average (Table 2.).

From the total of 295 Pick n' Roll of the Greek national team, 254 pertained to simple Pick n' Roll (86,1%), 20 to Double High (6,8%), 8 to Pop out (2,7%) and 13 to Pick and re-pick (4,4%), while the opposing teams from the total of 237 Pick n' Rolls they execute the 223 were simple (94,1%), 7 Double High (3%), 4 Pop out (1,7%) and 3 Pick and re-pick (1,3%).

**Table 2.** Team of attack \* Type of Pick n' Roll

			Type of Pick n' Roll				Total
			Simple	Double High	Pop out	Pick and re- pick	
Team of attack	Greece	N	86,1%	6,8%	2,7%	4,4%	55,4%
	Opponents	N	94,1%	3,0%	1,7%	1,3%	44,6%
Total		N	89,6%	5,0%	2,2%	3,0%	100,0%

Statistically significant differences were observed ( $\chi^2_{(13)}=88,729, p<0,05$ ) as pertains the combination of players in the Pick n' Roll between the Greek team and its opponents.



**Figure 1. :** Description of players combination in P/R  
 Symbols explanation: PG=Point Guard, SG=Shooting guard, SF=Small Forward, F=Power Forward, C=Center

In a total of 532 Pick n’ Rolls that were performed (Figure 1) the 264 pertain cooperation between Point Guard + Center (49,9%), 98 between Shooting Guard + Center (18,4%), 44 between Point Guard + Power Forward (8,3%), 25 between Shooting Guard + Power Forward (4,7%), 25 between Small Forward + Center (4,7%), 21 between Small Forward + Power Forward (3,9%), 13 between Power Forward + Center (2,4%), 14 between Point Guard + Power Forward + Center (2,6%), 6 between Shooting Guard + Small Forward (0,9%), 6 between Shooting Guard + Power Forward + Center (1,1%), 5 between Point Guard + Small Forward (0,9%), 4 between Point Guard + Shooting Guard (0,8%), 4 between Point Guard + Small Forward + Center (0,8%), 3 between Point Guard + Small Forward + Power Forward (0,6%).

In more detail,, the Greek team performed (Table 3.) 0 Pick n’ Rolls between Point Guard+ Shooting Guard (0%), 0 between Point Guard + Small forward (,0%), 22 between Point Guard + Power Forward (7,5%), 180 between Point Guard + Center (61 %), 1 between Shooting Guard + Small Forward (0,3%), 10 between Shooting Guard + Power Forward (3,4%), 52 between Shooting Guard + Center (17,6%), 2 between Small Forward + Power Forward (0,7%), 5 between Small Forward + Center (1,7%), 3 between Power Forward + Center (1 %), 0 between Point Guard + Small Forward + Power Forward (,0%), 4 between Point Guard + Small Forward + Center (1,4%), 10 between Point Guard + Power Forward + Center (3,4%) and 6 between Shooting Guard + Power Forward + Center (2%).

Respectively the opposing teams which performed 4 Pick n’ Rolls between Point Guard + Shooting Guard ( 1,7%), 5 between Point Guard + Small Forward ( 2,1%), 22 between Point Guard + Power Forward (9,3%), 84 between Point Guard + Center (35,8%), 5 between Shooting Guard + Small Forward ( 2,1%), 15 between Shooting Guard + Power Forward (6,3%), 46 between Shooting Guard + Center ( 19,4%), 19 between Small Forward + Power Forward ( 8 %), 20 between Small Forward + Center ( 8,4%), 10 between Power Forward + Center ( 4,2 %), 3 between Point Guard + Small Forward + Power Forward (1,3%), 0 between Point Guard + Small Forward + Center ( ,0%), 4 between Point Guard + Power Forward + Center ( 1,7%) and 0 between Shooting Guard + Power Forward + Center ( ,0%)

**Table 3.** Players combination in P/R.

Symbols explanation: PG=Point Guard, SG=Shooting guard, SF=Small Forward, PF=Power Forward, C=Center

Players Involved		Team of attack		Total
		Greece	Opponents	
PG+ SG	N	0,0%	1,7%	0,7%
PG+ SF	N	0,0%	2,1%	1,0%
PG+ PF	N	7,5%	9,3%	8,2%
PG+ C	N	61,0%	35,8%	49,6%
SG+ SF	N	0,3%	2,1%	1,1%
SG+ PF	N	3,4%	6,3%	4,6%
SG+ C	N	17,6%	19,4%	18,4%

SF+ PF	N	0,7%	8,0%	3,9%
SF+ C	N	1,7%	8,4%	4,6%
PF+ C	N	1,0%	4,2%	2,4%
PG+ SF+ PF	N	0,0%	1,3%	0,5%
PG+ SF+ C	N	1,4%	0,0%	0,7%
PG+ PF+ C	N	3,4%	1,7%	2,6%
SG + PF+ C	N	2,0%	0,0%	1,1%
Total	N	55,4%	44,6%	100,0%

The Greek team has performed more than double Pick n' Roll attacks with Point Guard + Center than its opponents (68, 2% against 31, 8% respectively), on the other hand the opponent teams have performed ten times more attacks with Small Forward + Power Forward (90, 5% against 9,5% respectively), quadruple number of attacks as well with Small Forward + Center as with Power Forward + Center respectively (80% against 20%).

Statistically significant differences were presented also ( $\chi^2_{(16)}=35,546$ ,  $p<0,05$ ) regarding the way of attack between the Greek team and its opponents as shown in Table 4. Particularly the Greek team after the Pick n' Roll attacked 26 times with ball handler's drive (9,6%), 35 times with split and pass to roller (12,9%), 52 times with split out and extra pass and shot (19,2%), 6 times with split and pass to pop out and 6 times with high low (2,2%), 15 times with Fake the Pick and drive (5,5%), 13 times with Fake the Pick and split out (4,8%) and 6 times with Fake the Pick split out and extra pass and shot (2,2%).

Respectively, the opponent teams after the Pick n' Roll performed their attacks 50 times with ball handler's drive (23,8%), 19 times with split and to roller (9%), 38 times with split out and extra pass and shot (18,1%), 4 times with Fake the Pick and drive (1,9%), 6 times with Fake the Pick and split out (2,9%) and finally only 1 time with Fake the Pick split out and extra pass and shot (0,5%).

As we observe the opponents of the Greek team performed over a double number of attacks with ball handler's drive (65,8% against 34,2% respectively). In contrast, the Greek team performed double number of attacks with split and pass to roller (64,8% against 35,2% respectively), devastating higher percentage of high-Low attacks after the pop out pass (100% against 0% respectively). We also observe, in the Greek team, much higher percentage of attacks with split out-extra pass and shot (57,8% against 42,2%), over than three times more attacks with Fake the pick and drive (78,9% against 21,1%), three times more of attacks with Fake the pick and split out (72,2% against 27,8%) and six times more attacks with Fake the pick και pass-pass-shot (85,7% against 14,3%).

As to the rest way of attack, after the Pick n' Roll move, no statistically significant differences were observed between the Greek and the opponents National teams.

**Table 4.** Way of attack \* team of attack.

Way of attack		Team of Attack		Total
		Greece	Opponent	
ball handler + shot	N	8,8%	8,5%	8,7%
ball handler + drive	N	9,6%	23,8%	15,8%
split and pass to roller	N	12,9%	9,0%	11,2%
split and pass at low post	N	2,9%	3,3%	3,1%
split out	N	15,1%	19%	16,8%
split + pass at weak side	N	8,1%	7,1%	7,7%
split + pass to pop out or flare	N	2,6%	1,4%	2,0%
split +pass to pop out + high-low	N	2,2%	0,0%	1,2%
split+extra pass-shot	N	19,2%	18,1%	18,7%
Fake the Pick +shot	N	1,8%	1,4%	1,6%
Fake the Pick +drive	N	5,5%	1,9%	3,9%
Fake the Pick +split and pass to roller	N	2,5%	2,3%	2,5%
Fake the Pick +split and pass at low post	N	0,7%	0,0%	0,4%
Fake the Pick +split and pass at weak side	N	0,7%	0,0%	0,4%
Fake the Pick +split and pass to pop out	N	0,0%	0,5%	0,2%
Fake the Pick + split out	Nt	4,8%	2,9%	3,7%
Fake the Pick +extra pass- shot	N	2,2%	0,5%	1,4%
Total	N	56,4%	43,6%	100,0%

Statistically significant differences between Greece and its opponents were presented in regards to the player who would perform the shot after the Pick n' Roll ( $\chi^2_{(4)}=31,439$ ,  $p<0,05$ ). As shown in Table 5. From a total of 382 offenses which were executed, 108 ended with Point Guard (28,3%), 75 ended with Shooting Guard

(19,6%), 47 ended with Small Forward (12,3%), 73 ended with Power Forward (19,1%) and 79 ended with Center (20,7%)

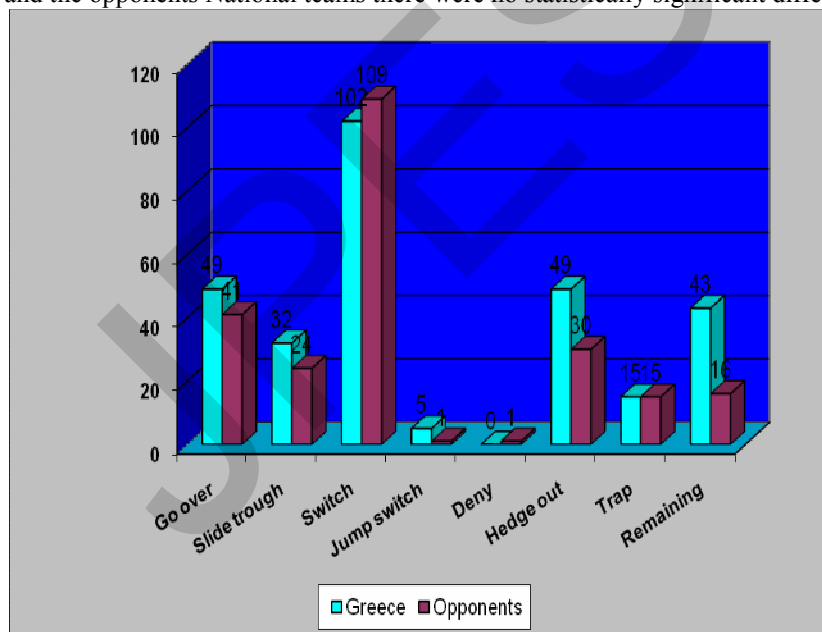
**Table 5.** Player of attack \* Team.

		Player of attack					Total	
		Point Guard	Shooting Guard	Small forward	Power forward	Center		
Team in Offense	Greece	N	29,4%	18,2%	4,7%	22,4%	25,2%	56,0%
	Opponents	N	26,8%	21,4%	22,0%	14,9%	14,9%	44,0%
Total		N	28,3%	19,6%	12,3%	19,1%	20,7%	100,0%

Detailed, from the total of 214 offense were performed by the Greek team 63 of them were finished by Point Guards (29,4%), 39 by Shooting Guards (18,2%), 10 by Small Forwards (4,7%), 48 by Power Forwards (22,4%) and 54 by Centers (25,2%).

On the other hand the opponents team performed 168 offenses and the final shot was attempted 45 times by Point Guards (26,8%), 36 times by Shooting Guards (21,4%), 37 times by Small Forwards (22%), 25 times by Power Forwards (14,9%) and 25 times by Centers (14,9%). We observed that when Greek team was attacked with the Point Guard its percentages was much higher than its opponents (58,3% against 41,7%), oppositely the opponents were attacked with Small Forwards three times more respectively to Greek team average (78,7% against 21,3%).

The Greek team showed a preference to attack with the Power Forwards, over a double percentage respectively to opponent teams average (65,8% against 34,2%), as to attack with Center with similar percentage respectively to opponent teams average (68,4% against 31,6%). As regards to the attacks with Shooting Guards between the Greek and the opponents National teams there were no statistically significant differences observed.



**Figure 2. :** Way to defend Pick n'Roll

The Chi Square did not show statistically significant differences regarding the section of the court where the shot was performed ( $\chi^2_{(8)}=8,208$ ,  $p<0,05$ ). Nevertheless the Greek team's percentages from the Low Post area were over a double respectively to opponent teams (64,8% against 35,2%). Specifically the Greek team performed 70 shot from this area in comparison with the only 38 of its opponents. For the rest of the court sections the percentage laid at the same levels. Every team had a preference for 3 G section. In a total of 317 shots 87 of them were made from this section (27,4%) and the Greek team performed the 48 of them (55,2%)

As regards to the defensive confrontation of the Pick n' Roll statistically significant differences were observed between the Greek team and its opponents ( $\chi^2_{(8)}=16,552$ ,  $p<0,05$ ) (Figure 2.). From a total of 532 Pick n' Roll which were performed 90 of them were confronted with Go over the top (16,9%), 56 with Slide Through (10,5%), 211 with Switch (39,7%), 6 with Jump Switch (1,1%), 1 with Deny (0,2%), 79 with Hedge Out











