When the Weak Survives Taking Advantage of Rivalry Between Stronger Opponents?

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Abstract

Not always might is an asset; not always heavyweights win, and lightweights lose. Not all conflicts are two-person zero-sum games in which the winner's gains equal to the loser's losses. Often, conflicts are "games" played by more than two players with varying skills and strengths; and gains and losses are distributed unevenly. A weak player can survive by exploiting the rivalry among stronger opponents. Political and economic contests are non-zero-sum games in which both competition and cooperation go together, and even the loser gets a stake. Based on a three-person three-way duel, this paper mathematically proves the proposition that, if played strategically, the weak can survive a conflict in a fight against far stronger opponents. The paper has limitations that are intrinsic to rational choice theory. The war between the State of Eritrea, the Federal Republic of Ethiopia, and the Tigray Liberation Front can be analysed using this game model. So long, as there is peace between Ethiopia and Eritrea, the chances of TPLF survival are extremely low.

Keywords: Game theory, Truel, Three-way duel, Ethiopia, Eritrea, TPLF

I. Introduction

This article extends the discussion on a three-way duel (or truel) presented by Professors A. Dixit and B. Nalebuff (1994) in their popular book "Thinking Strategically: The Competitive Edge in Business, Politics, and Everyday Life" (pp. 329 - 331). It analyses all the possible six orders and made the choices among orders an integral part of the game. Furthermore, it introduces side-payment to allow the coexistence of competition and cooperation. The paper analysis to what extent the weak can survive

competition by exploiting the rivalry between stronger opponents. The political situation in Ethiopia and Eritrea is taken as a case study.

The paper endorses the assumptions of the Rational Choice Theory that agents (or players) are rational utility maximisers subject to the constraints they face. It uses value-neutral analytical deduction and abstraction as a methodology alongside using secondary sources for the interpretation

II. The Model

Assume that three antagonists, Mr. X, Y, and Z are engaged in a three-way duel. Assume further that Mr. X is a poor shot with only a 30 percent chance of hitting his target while Mr. Y is a much better shot, achieving 80 percent accuracy; Mr. Z is a perfect shot - which never misses. Each person knows his own and the rival's strength and reputation. Who has the highest chance of survival? Is there any possible strategy for Mr. X, the weakest of all, to win this deadly game?

Professors A. Dixit and B. Nalebuff (1994) in “Thinking Strategically: The Competitive Edge in Business, Politics, and Everyday Life” (pp. 329 - 331) state the rule of the game and the likely outcomes as follows[1]:

The Rule

There are two rounds. In the first round, each player is given one shot: first X, then Y, and then Z. After the first round any survivors are given a second shot, again beginning with X, then Y, and then Z.

The Likely Outcomes

To start the game, Mr. X is given a pistol with a bullet. If he shoots at Y and hits, the next turn is Z’s, and Mr. Z certainly will kill X. This is the worst strategy for Mr. X since

[1] . Dorraki M. Allison A, and Abbott D. (2019) discuss this model without assigning any specific probability of hitting their targets other than $0 < x \leq y \leq z < 1$.

his chance of survival is 0%. If Mr. X shoots at Mr. Z and hits, then it's Y's turn. Mr. Y will shoot at Mr. X and the probability that Y will win the game in the two rounds is 0.912 (91.2%). This is not an attractive option either. If X misses his first shot, no matter whom he aimed, then it's Y's turn. Likely, Mr. Y will aim at Mr. Z because eliminating Z increases his chance of survival. If Y kills Z, then in the second round Mr. X will have at least a 30 percent chance of survival. The third outcome is better than the other two. Why then does not Mr. X fire up in the air in the first round? By doing so he will force the giants to kill each other! If Mr. X is wise enough to choose this strategy his chance of survival will be 41.2 percent, that of Y - 56 percent, and that of Z, the sharpshooter, only 14 percent.

This game has many important theoretical and practical applications. Thus, this paper attempts to further the analysis of the game taking in mind the Tigray Liberation Front (TPLF) as Mr. X, the State of Eritrea as Mr. Y, and the Ethiopian Federal and Allied Forces as Mr. Z.

This game model can be improved by raising the following six questions:

1. For three entities there are six ways of ordered arrangements; (X,Y,Z), (Y,X,Z), (Y,Z,X), (Z,X,Y), (Z,Y,X) and (X,Z,Y). Professors A. Dixit and B. Nalebuff discussed only the first, (X, Y, Z), order. What are the possible outcomes in the other five orders? This can be interpreted as: "Does it matter who started the war?"
2. Is there any possibility for side payments, exchange, or cooperation between any two players to eliminate the third? What will happen if two players conspire against the third?

III. Orders

The possible outcomes are dependent on the order that determines who should shoot first, second, and last. Table 1 summarizes the likely outcomes in terms of probability of survival in each order when all players move strategically (see Annex 1)[2].

Order	Probability of Survival (%)			Remarks
	X	Y	Z	
X,Y,Z	41.2	56.0	14.0	(X) ∩ (Y)=11.2
Y,X,Z	41.2	52.64	14.0	(X) ∩ (Y)=7.84
Y,Z,X	41.2	52.64	14.0	(X) ∩ (Y)=7.84
Z,X,Y	30.0	0.0	70.0	
Z,Y,X	30.0	0.0	70.0	
X,Z,Y	30.0	0.0	70.0	

Table 1 Outcomes for Rational Players

Close observation of table 1 helps to substantiate the following statements:

1. According to the likely outcomes, we can classify the six orders into three groups: group A - (X, Y, Z), group B - (Y, X, Z) and (Y, Z, X), and group C - (Z, X, Y), (Z, Y, X), and (X, Z, Y).
2. The position of X (that is, should his turn be before or after Y, or before or after Z) does not determine his probability of survival. Consequently, he is indifferent to his position. But, and this is an important point, he is not indifferent to the positions held by the other two; he should always prefer those orders in which Y moves before Z, no matter what his position is.
3. The position of Y in relation to Z (or that of Z in relation to Y) is what determines the likely outcomes of the game for all participants. Specifically, Z will be better off if he moves before Y but both X and Y will be worse off. On the other hand, if Y moves before Z, both X and Y will be better off.

From the above discussion, it should be clear that it is in X and Y's common interest that one of the orders in group A or B is chosen for the three-way duel. However, the degree of preference is not equal; Mr. Y's degree of preference is by far higher than that of Mr. X's.

[2] . Six charts (one for each order) are presented in the annexes.

IV. Game with Side-Payments

If side-payment or exchange is introduced in our model, the outcomes will be changed substantially. As it is shown in Table 1, if order (Y, X, Z) or (Y, Z, X) is to be chosen, the most unfortunate person will happen to be Mr. Z, the sharpshooter. Is there any possibility for Mr. Z to change the order without violating the simple majority rule? We know that Mr. X is indifferent to his own position. It is the position of Mr. Y in relation to Mr. Z that concerns him. This and all other factors already discussed make Mr. X's vote decisive and pivotal. Any order preferred by Mr. X will pass by a 2:1 vote. Why then does not Mr. Z try to buy Mr. X's pivotal vote? This can be done, for instance, in the following way. Mr. Z will go to Mr. X and say: "I offer you the following deal. If you vote for (Z, X, Y) or (Z, Y, X) orders, I will eliminate our common enemy, Mr. Y, in my first shot; then it will be your turn. You will shoot at me. If you kill me, you will be the absolute winner. If you miss me, then it is my second turn. You know that I am a sharpshooter, but since you helped me by voting for my favourite orders, I promise you that I will fire up in the air (this is the price for your vote) thus both of us will survive." Mr. X should accept this offer because it improves his probability of survival, in this particular case, it even guarantees him life! If the game is played following the deal, the probability that X will survive is 100 percent; that of Y is 0 percent, and that of Z is 49 percent. That is both Mr. X and Mr. Z will benefit a lot from this deal at the expense of Mr. Y.

However, once side-payment is allowed and knowing that Mr. Z will certainly try to alter the choice of orders by buying Mr. X's pivotal vote, it is unlikely that Mr. Y will passively await his fate. He will also come to Mr. X with a counteroffer for his vote for the (X, Y, Z) order. The procedure is similar to the one described above.

The following table summarizes the likely outcomes when side-payment (exchange) is allowed:

Orders	Probability of Survival (%)			Remarks
	X	Y	Z	
X,Y,Z	86.0	56.0	14.0	When Y trades with X
Y,X,Z	86.0	39.2	14.0	" " "

Y,Z,X	86.0	39.2	14.0	" " "
Z,X,Y	100.0	0.0	49.0	When Z trades with X
Z,Y,X	100.0	0.0	49.0	" " "
X,Z,Y	100.0	0.0	70.0	" " "

Table 2: Outcomes with Side Payments Allowed

One may note from table 2 that orders (X, Y, Z) and (X, Z, Y) have a unique characteristic: they improve the well-being of Y or Z, respectively, without making X worse-off. This means that there is always one player who wants X to move first. This makes Mr. X even stronger in determining the choice among orders and, ultimately, the likely outcomes as well.

The analysis proves that in the one-time three-player game with a side payment allowed Mr. X, the weakest of all, is the most likely survivor. He may even guarantee himself a life. This proves that miniatures may win battles against giants. However, since rivals do not necessarily trust each other, there is a problem of enforcing the contracts (deals). This problem calls for an amendment of the rule of the game.

V. The Rule of the Game

Let us assume that Mr. Z has traded with Mr. X and therefore (Z, Y, X) order has been chosen. This means that after Z killed Y, X will fire at Z. If X hits Z, the game is over; and X will be the only survivor. However, there is a 70 percent chance that X may miss Z when, if it occurs, then according to the deal, will lead to Z firing up in the air because this is the "price" Z has agreed to pay for X's pivotal vote in choosing the order.

Does this sound realistic? Being antagonists, how can Mr. X trust Mr. Z? What if Mr. Z broke his promise and killed Mr. X? Of course, Mr. X cannot take revenge after being killed. Without an effective mechanism that may guarantee enforcement of promises, the sort of exchange we have discussed makes little sense if any. This problem calls for an amendment to the rule of the game. The amended rule should read something like the following:

> *There are two rounds. In the first round, each player is given one shot, according to the order chosen by the players themselves. After the first*

round, any survivors are given a second shot, again according to the same order as in the first round. The game will continue until only one player is left alive or a point of exchange is reached if such a thing exists.

A short description of the amended rule may be necessary.

1. It is possible that the players will approve the amended rule unanimously. Since this rule will be amended before the choice among orders is made, neither Y nor Z will be certain who will benefit more. Rather each of them will remain hopeful that under the new rule he will be in a better position to buy X's pivotal vote. Thus, both Y and Z will vote "yes" for the amended rule[3]. Mr. X is, of course, the person most interested in adopting the amended rule.
2. Even if we assume that the players possess perfect knowledge and thus there is no uncertainty considering the likely effect of the amended rule, the rule nevertheless will be passed by a 2: 1 vote.
3. Under the amended rule promises are fully enforced. For example, in the (Z, Y, X) order, Z kills Y, then X shoots at Z. If X kills Z, the game is over, and Mr. X is the only survivor. If he misses, again the game is over. A pistol with a bullet will not be given to Z since he has already sold off his chance of playing further.
4. There is only one point in each order where the game may come to an end in the way described at 3 above. The point is in the area marked for exchange in each chart in an annex.

The amended rule brings about new patterns of likely outcomes. The following table summarizes the likely outcomes with a side-payment allowed under the amended rule.

	Probability of survival (%)		
Order	X	Y	Z
(X,Y,Z)	86.0	56.0	14.0
(Y,X,Z)	86.0	56.0	14.0

3 . This reminds us John Rawls' (1971) "The veil of uncertainty and ignorance". According to Rawls, adopting just and fair rules through collective decisions is easier if members of the collective cannot anticipate in what ways each member will be affected by the rules.

(Y,Z,X)	86.0	56.0	14.0
(Z,X,Y)	100.0	0.0	70.0
(Z,Y,X)	100.0	0.0	70.0
(X,Z,Y)	100.0	0.0	70.0

Table 3: Outcomes under the Amended Rules

Now, under the amended rule with side-payment allowed, all the first three orders in table 3 (hence after, "group I") yield the same set of likely outcomes. Similarly, the last three orders (hence after, "group II") yield another set of likely outcomes. Thus, if the players are perfectly rational, the choice is not among six orders but only between the two groups.

Which of the two groups will be chosen? Since Mr. X has the decisive vote, any option preferred by him will pass by a 2:1 vote. If the game is a two-round only game, which will not be repeated sometime in the future between the survivors (in those cases where two of the three players survive), then Mr. X will rationally vote for the orders in group II. But what if the game should continue between the survivors[4]?

VI. Continuity

Mr. X will rationally choose any order in-group II if the game is a one-time game. However, if there is a possibility that the game may be repeated sometime in the future between two survivors, the choice becomes more difficult.

In the I group orders, the probability that both X and Y will survive is 56 percent, and this is the probability that the game may be repeated sometime in the future if any one of the I group orders has been chosen for the first-round game. In the second round, (future) game there will be two orders: (X, Y) and (Y, X). Under the same rule of the game, (X, Y) yields a 36.16% chance of survival for Mr. X and 65.8% for Mr. Y; and order (Y, X) yields only an 8.8% chance of survival for Mr. X and 93.16% for Mr. Y.

In the II group orders, the probability that both X and Z will survive is 70 percent, and this is the probability that the game may be repeated sometime in the future if any one

[4]. Note that repeating the game and playing it for more than two rounds are basically the same

of the II group orders has been chosen for the first-round game. In the second round (future) game there will be two orders: (X, Z) and (Z, X). Under the same rule of the game, (X, Z) yields a 30% chance of survival for Mr. X and 70% for Mr. Z; and order (Z, X) yields a 0% chance of survival for Mr. X and a 100% chance of survival for Mr. Z.

In second-round games, Mr. X will be better off if he moves first, no matter against whom he is going to play the game. However, since there is no privilege for X, the order should be chosen by tossing a coin, so that each order has a 50% chance of being chosen.

Table 4 summarizes the likely outcomes in second-round (future) games among survivors of the first-round game.

Orders	**Probability of Survival (%)**		
	X	Y	Z
(X, Y)	36.16	65.80	-
(Y, X)	8.80	93.16	-
(X, Z)	30.0	-	70.0
(Z, X)	0.0	-	100.0

Table 4: Outcomes of the Second-round Game

Note that if any one of the orders in group I has been chosen for the first-round game, the probability that the game may be repeated is 56%. Then in the second-round game, the chance that any of the two orders may be selected is 50% each. Thus, the probability of survival of the players under the amended rule with a side-payment allowed in two-round game (or in a one-round game with four-round shots) is 0.3 + [0.56 x 0.5 (0.3616+0.088)] = 0.425888 i.e. 42.55888% for Mr. X; 0+[0..56 x 0.5 (0.658+0.9316)] =0.445088 i.e. 44.5088% for Mr. Y; and 14 +0=14% for Mr. Z.
However, if anyone order in group II has been chosen, then the chance of survival of each player after playing two round games will be 0.3+[0.7 x 0.5(0.3+0)] = 0.405 i.e. 40.5% for Mr. X; 0% for Mr. Y; and 0 +[0.7 x 0.5(0.7+1)] =0 .595 i.e., 59.5% for Mr. Z. Therefore, should the game be repeated one more time, Mr. X will rationally choose one of the orders in group I. By doing so, Mr. X will secure a 42.55888% chance of

survival however he still runs a 1.96% risk that the game may be repeated for the third time.

The following table summarizes the whole analysis of the game.

Condition	**Orders that are likely to be chosen by the players under majority rule**	**Ultimate chance of survival (%)**			**Remarks**
		X	Y	Z	
A one-time game without side-payments	(Y,X,Z) or (Y,ZX)	41.2	52.64	14.0	From table 1
A one-time game with side payments is allowed under the amended rule.	(Z,XY), (Z,YX) or (X,Z,Y)	100.0	0.0	70.0	From table 2
A two-time game without side-payment	(Y,X,Z), or (Y,Z,X)	35.5814	50.994	14.0	Tables 3 and 4 plus more calculations. P(X)^P(Y)=0.58084
A two-time game with side payments is allowed under the amended rule	(X,Y,Z), (Y,X,Z) or (Y,Z,X)	42.53888	44.5088	14.0	Tables 3 and 4 plus more calculations. P(X)^P(Y)=1.0976%

Table 5: Summarising Table

Note that even when the game is played for four rounds (i.e. a two-time game), still Mr. X, the miniature has a greater chance of survival than Mr. Z, the super-giant!
Here we come to our conclusions:

1. Being the weakest does not necessarily mean becoming the loser in war games. Conversely, being strong does not guarantee to win them.
2. In one-time games, it is better not to be the strongest and not to behave as such. Verbal insults and military parades and arms twisting are often used to provoke the other(s) to start the fight, so determining the order.
3. Cooperation exists even in such war games as the one we have just analysed. Cooperation can exist “without friendship or foresight” (Axelrod, 1984, Chapter 3). However, as the game is played several times, the incentive for further cooperation seems to diminish.

4. The game effectively demonstrates that there are two distinct types of choices: choices between orders and choices between strategies in a given order. Choices between orders are what James Buchanan, a Nobel Prize Laureate in economics, call them creative choices, or constitutional choices, or choices of higher order while choices between strategies in a given order are what he called reactive choices, or post-constitutional choices, or choices of lower order (Buchanan and Tullock, 1967; Buchanan, 1994). The analysis proves that the likely fate of the players depends not only on their skill and the strategy chosen by them but also on the order; thus, the choice among orders is part of the game itself. A choice between alternative political and economic systems (for example, a choice between a market and command economy) can be conceived as a choice between orders. Pre-emptive and reactive attacks can also be conceived as a choice between orders.

VII. Interpretation

Background

Students of conflict studies, political science, economics, and sociology may interpret the game in different ways. One such interpretation can be the ongoing war between the Tigray Liberation Front (TPLF), the State of Eritrean (SE), and the Federal Democratic Republic of Ethiopia (FDRE).

TPLF is a leftist organisation that claims to represent the ethnic Tigray people of Ethiopia; it was established in 1975 in Dedebit, North-western Tigray (Uhlig, 2003). Since its inception in 1975, TPLF was allied with Eritrean People Liberation Front (EPLF) and fought against the Ethiopian government. In 1991, TPLF (as a core member of the coalition Ethiopian People Revolutionary Democratic Front (EPRDF)) took power in Ethiopia, while EPLF controlled Eritrea. After two years of “transition period” EPRDF formed FDRE, while EPLF formed an independent State of Eritrea (SE). The inner party conflict within EPRDF was exacerbated through time and forced TPLF to pull itself out of EPRDF in 2018. Since then, TPLF stood as an opponent to

FDRE. The FDRE parliament designated TPLF as a terrorist organisation on 5 May 2021. Nevertheless, TPLF continued to be the ruling party of the Tigray Regional State of FDRE which a home to about six percent of the Ethiopian total population.

Eritrea is a country in the Horn of Africa that has a total area of approximately 117,600 km^2 that includes one thousand km of the Red Sea coast; it has a population of about 6 million people. Following the United Nations supervised referendum in April 1993, the Eritrean people overwhelmingly voted for independence from Ethiopia. On 28 May 1993, the United Nations formally admitted Eritrea to its membership (UN Digital Library, 1993). In 1998 a border conflict between Eritrea and Ethiopia started and lasted until 2018 passing through various phases. The disputed lands including Badme are located inside the current Tigray regional state's territory, which is governed by TPLF.

The Federal Democratic Republic of Ethiopia is a landlocked country in the Horn of Africa. It shares borders with Eritrea to the north, Djibouti to the northeast, Somalia to the east and southeast, Kenya to the south, South Sudan to the west, and Sudan to the northwest. Ethiopia has a total area of 1,100,000 square kilometres and a 120 million population.

Analysis

Until recently, TPLF has been smart in playing the three-way duel. From its inception up to 1991, it has allied with EPLF to fight against its common enemy, the Ethiopian government. After TPLF controlled the federal power in Ethiopia, it switched a partner keeping the conflict alive. During these periods, TPLF was playing implementing the strategies discussed above in section IV. From 1998 – 2018, it used the federal government resources to fight against the State of Eritrea. During both periods TPLF was using its relative weakness as a strength by aligning itself with one of the antagonists; first with the Eritrean EPLF and then with Ethiopia's EPRDF.

TPLF's strategy has changed since 2018. In 2018, with the ascendance of Abiy Ahmed to the Ethiopian Premiership, the "Cold War" between Eritrea and Ethiopia ended (The Economist, 2018). Abiy Ahmed Ali of Ethiopia won the 2019 Nobel Peace Prize mainly

for his role in ending the two-decade hostility between the two countries (Ahmed, 2019). However, “The peace process [between FDRE and SE] failed to adequately consult some stakeholders like the TPLF” (Demissie, 2020). Now TPLF is fighting against both SE and FDRE. We are observing a tacit alliance between FDRE and SE. The Guardian reports that “Eritrean troops entered Tigray to back the Ethiopian military after fighting broke out in November 2020 before withdrawing from most areas last year” (The Guardian, 2022); the news is that they are back again.

According to the findings of the model discussed in this article, TPLF’s survival depends on the rivalry between FDRE and SE. Until 2018, TPLF has been a smart player. Despite its relative weaknesses, it has survived the conflict because of its alliance with either Eritrea or Ethiopia. Now it is antagonising both; it is now less likely that it will survive the conflict.

VIII. Limitations

This paper has certain limitations most of which are inherent to its theoretical base – Rational Choice Theory. The players Mr. X, Y, and Z, and TPLF, SE, and FDRE are assumed to be rational whereas people, groups, and states may not always act rationally (Kahneman, 2011; Loasby, McGuire and Radner, 1972). The model ignores the roles of individual agency and proxy agency (where players act on their own behalf or behalf of someone else), ideas, norms, history, and identity (Hay, 1995; 2002); whereas the conflict in Ethiopia is highly intermingled with these factors. Lastly, the game is confined to the three players; in the reality, however, there are many other players including the international community. Despite these limitations, the model illustrates the general picture of the conflict.

IX. Conclusion

Weakness can be an asset if utilised wisely. The weak can survive competition against much stronger opponents by letting the stronger opponents fight against each other; or by colluding with some of the stronger opponents against other strong opponents. However, it is detrimental to the weak if it is engaged in a battle against stronger

opponents without any alliance with either of stronger opponents. Despite its relative weakness, the Tigray People Liberation Front (TPLF) has survived the conflict in the Horn of Africa for the last several decades by aligning either with Eritrea or Ethiopia. However, now it is trapped in a conflict against both, and this can be detrimental to its existence.

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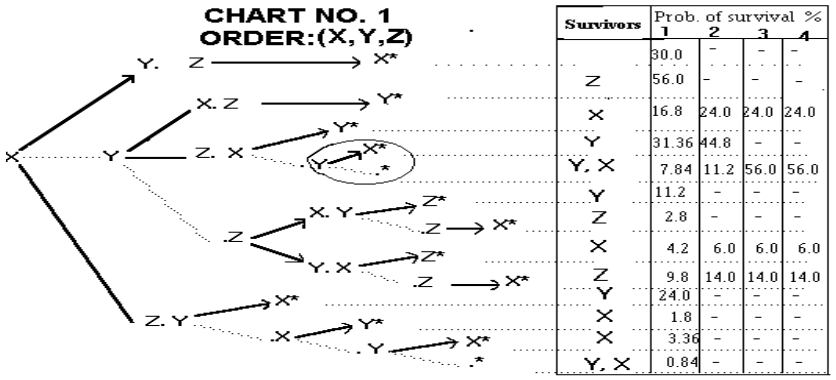
Extended Game Tree 1: Order XYZ

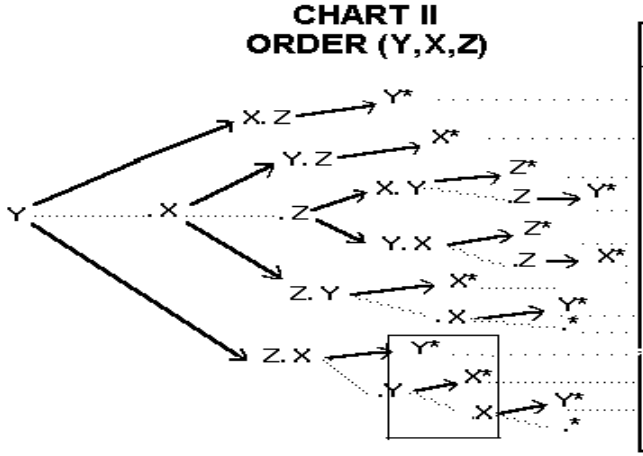


Survivors	Prob. of survival % 1	2	3	4
	30.0	–	–	–
Z	56.0	–	–	–
X	16.8	24.0	24.0	24.0
Y	31.36	44.8	–	–
Y, X	7.84	11.2	56.0	56.0
Y	11.2	–	–	–
Z	2.8	–	–	–
X	4.2	6.0	6.0	6.0
Z	9.8	14.0	14.0	14.0
Y	24.0	–	–	–
X	1.8	–	–	–
X	3.36	–	–	–
Y, X	0.84	–	–	–

Note

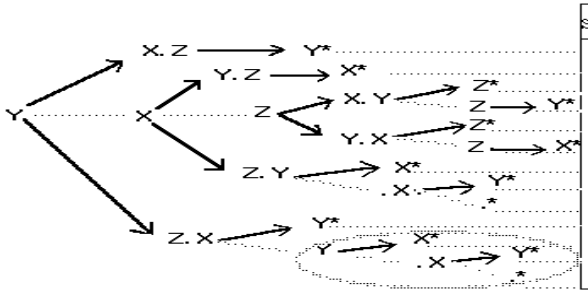
- The 1st column shows the survivor(s)
- The 2nd column shows the outcomes of the game when it is played without side payments.
- The 3rd column shows the outcome when side payment is allowed.
- The 4th column shows the outcomes when the game is played according to the amended rule.
- The positions where exchange of probability of survival is possible are marked in each chart.

Extended Game Tree 2: *Order XYZ*



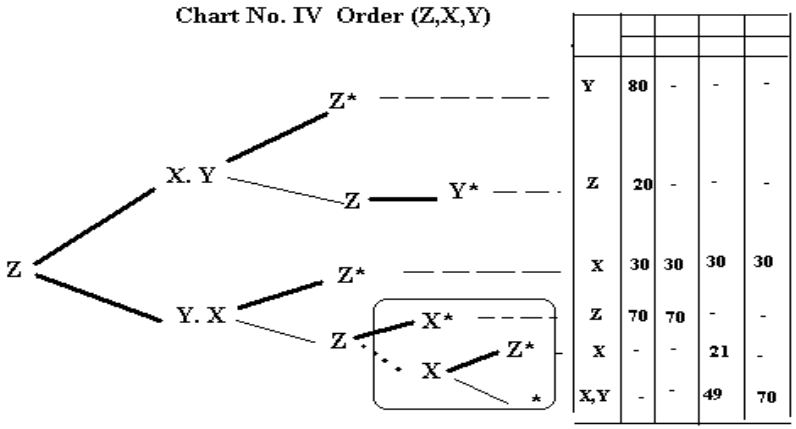
Survivors	Prob. survival (%) 1	2	3	4
Z	80.0	-	-	-
Z	6.0	-	-	-
Y	11.2	-	-	-
Z	2.8	-	-	-
X	4.2	6.0	6.0	6.0
Z	9.8	14.0	14.0	14.0
Y	4.8	-	-	-
X	3.6	-	-	-
X, Y	8.4	-	-	-
X	24.0	24.0	24.0	24.0
Y	44.8	44.8	-	-
X	3.36	3.36	16.8	-
X, Y	7.84	7.84	39.2	56.0

Extended Game Tree 3: YZX



Survivors	Prob. of survival (%)			
	1	2	3	4
Z	80.0	-	-	-
Z	6.0	-	-	-
Y	11.2	-	-	-
Z	2.8	-	-	-
X	4.8	6.0	6.0	6.0
Z	9.8	14.0	14.0	14.0
Y	4.8	-	-	-
X	3.6	-	-	-
X, Y	8.4	-	-	-
X	24.0	24.0	24.0	24.0
Y	44.8	44.8	-	-
X	3.36	3.36	16.8	-
X, Y	7.84	7.84	39.2	56.0

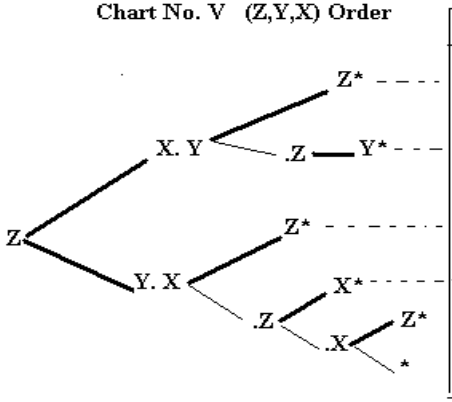
Extended Game Tree 4



Y	80	-	-	-
Z	20	-	-	-
X	30	30	30	30
Z	70	70	-	-
X	-	-	21	-
X,Y	-	-	49	70

Extended Game Tree 5

Chart No. V (Z,Y,X) Order



Y	80	-	-	-
Z	20	-	-	-
X	30	30	30	30
Z	70	70	-	-
X	-	-	21	-
X,Z	-	-	49	70

Extended Game Tree 6 : Order XZY