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**Further evidence on game theory, simulated interaction, and
unaided judgement for forecasting decisions in conflicts**

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Abstract

If people in conflicts can more accurately forecast how others will respond, that should help them make better decisions. Contrary to expectations, earlier research found game theorists' forecasts less accurate than forecasts from student role players. To assess whether game theorists had been disadvantaged by the selection of conflicts, I obtained forecasts for three new conflicts of types preferred by game theory experts. As before, role-players in simulated interactions were students and other students provided forecasts using their judgement. For eight conflicts, including five from earlier research, 102 forecasts by 23 game theorists were no more accurate (31%) than 357 forecasts by students who used unaided judgement (32%). Of 105 simulated-interaction forecasts, 62% were accurate: an average error reduction of 47% over game-theorist forecasts. Forecasts can sometimes have value without being strictly accurate. Assessing the usefulness of forecasts led to the same conclusions about the relative merits of the methods.

Key words: accuracy, methods, role playing, strategy, usefulness.

JEL classification: C70, D74.

Biography

In recent years, Dr Green has been doing interesting and rewarding research on the problem of how best to predict the decisions people will make in conflict situations. He is responsible for www.conflictforecasting.com. He has presented papers on his work at International Symposia on Forecasting, the RAND Organization, Warwick Business School, the Institute of Mathematics and its Applications Conference on Conflict and its Resolution, Melbourne Business School, and to the London Judgement and Decision Making Group. Prior to his academic career, Dr Green spent more than twenty years in business as a founder and manager of several companies.

Conflicts are an important concern for all of us. Just how important, is illustrated by the pervasiveness of conflict stories in the news. For example, among the top 21 articles headlined on the homepage of *The New York Times* on August 4, 2003¹, more than half were concerned principally with conflicts in which two or more parties were interacting. They included such stories as “Food and peace just a memory in Liberian city”, “Taliban are killing clerics who dispute holy war call”, “*Verizon* contract talks extend into the night”, and “Hollywood producer makes 2nd bid for German TV group”.

It seems likely that improved forecast accuracy would lead to better decisions. For example, consider the management of *Verizon* (above) who were involved in negotiations with unions. If they could have predicted which offers would lead to agreements and which would not, and if the unions could have predicted which demands would be accepted, a speedier resolution and a better outcome would have been possible. The problem of forecast accuracy is an important one: the cost of poor decisions can be high, as they have been in conflicts between government agencies and terrorist leaders.

Green (2002) presented findings on the accuracy of forecasts from three methods for predicting decisions in conflicts. Five of the six conflicts used in the research involved interaction between parties. All were real situations. For those five conflicts, game theory experts’ forecasts were little more accurate (28% of predictions were correct) than the unaided-judgement forecasts of university students (27%). In contrast, forecasts from simulated interaction (a type of role playing in which participants extemporise the prospective interactions of parties in a conflict situation) were substantially more accurate (61%).

Erev, Roth, Slonim, and Barron (2002), and Goodwin (2002), in commenting on Green (2002), suggested the possibility that some types of conflict may be more amenable than others

to forecasting by game theorists. I identified five published forecasting applications by game theorists, and reasoned that they would have selected conflicts of types they judged suitable for forecasting. Brams and Togman (2000) and Organski (2000) used game theory to make conditional predictions on the outcomes of civil conflicts in Northern Ireland and the Middle East, respectively. Gruca, Kumar, and Sudharshan (1992) used game theory to predict incumbents' responses to a new competitor. Keser and Gardner (1999) discussed the use of game theory to predict the outcomes of common pool resource conflicts. Finally, Ghemawat and McGahan (1998) used game theory to explain the behaviour of a group of competing electricity generating companies. The writings of these researchers express or imply recommendations to apply game theory to particular types of conflict forecasting problem. The conflict types could be characterised as civil unrest, competitor responses to new entrants, common-pool resource allocation dilemmas and, as suggested by Ghemawat and McGahan, situations of concentrated competition, mutual familiarity, and ongoing interaction.

It is worth noting that not all game theory experts make a distinction between types of conflict suitable for forecasting with game theory, and types of conflict that are not. For example, Fraser and Hipel (1984) maintained that their game-theoretic method (conflict analysis) can usefully forecast any type of conflict.

In this article, I present new findings on the accuracy of forecasts from game theorists, unaided judgement, and simulated interaction for three conflicts that are dissimilar to the five in Green (2002). The three forecasting methods and the research method are as described in that article, which is available in full text on the Internet together with commentaries (see Papers at www.conflictforecasting.com).

Is it obvious which method will provide the most accurate forecasts? I present evidence on the expectations people have regarding the performance of the three forecasting methods. Second, I describe the three new conflicts. Third, I assess whether the three new conflicts, as well as the five used in the earlier research, are of types preferred by game theorists. I then describe and discuss my findings.

Expectations of accuracy

Prior to talking to various groups about forecasting for conflict situations, Scott Armstrong and I obtained opinions from attendees. Respondents were academics and students at Lancaster University (19 usable responses), Manchester Business School (18), and Melbourne Business School (6), and Harvard Business School alumni (8), Royal New Zealand Police College educators (4), conflict management practitioners in New Zealand (7), and attendees at a Glasgow conference on organizational foresight (15). We asked the 77 respondents for their expectations regarding the accuracy of forecasts of decisions in conflicts from different methods. We told them that by selecting one outcome at random for each conflict a forecaster could expect 28% of forecasts to be accurate. Responses that included accuracy figures less than 28% were excluded from analysis.

The median expectations of the percentage of accurate forecasts were 30% for novices' unaided judgements, 40% for simulated interaction using novice role-players, and 50% for game theorists. The respondents' implied rankings of the methods by forecast accuracy were broadly consistent (Kendall coefficient of concordance $W = 0.36$; $P < 0.001$, $k = 77$, and $N = 3$; Siegel and Castellan 1988.) The averages of their expected accuracy rankings were:

1. Game-theorist forecasts by experts: 1.6
2. Simulated interaction using novices: 1.8
3. Unaided judgement by novices: 2.6

The rankings have face validity. It seems reasonable to expect experts to provide forecasts that are more accurate than those of novices, and game theorists recommend game theory for forecasting (Green 2002). Camerer (2003) listed “predicting what is likely to happen” as one of the two important uses of game theory (p. 157), and Dixit and Skeath (2004) wrote “When looking ahead to situations where multiple decision makers will interact strategically, we can use game theory to foresee what actions they will take and what outcomes will result” (p. 37).

Conflict forecasting problems

I compiled material for three new conflicts: a personal grievance dispute about pay levels, a corporate takeover battle, and an international dispute with two countries edging towards war. I refer to them as Personal Grievance, Telco Takeover, and Water Dispute, respectively. Copies of the material are available at www.conflictforecasting.com. [For reviewers, descriptions of the eight conflicts used in the research programme are attached as Reviewer Appendix 1.] The three new conflicts are of types preferred by game theorists and are relevant to different decision makers.

Names of the parties, and other details, were disguised in the conflict descriptions. Participants were asked if they recognised the conflicts and their responses were excluded from analysis if they correctly identified the actual situation. None of the participants in the research new to this paper recognised any conflicts.

Personal Grievance was a conflict over the importance of an employee's role and the pay scale for that role. A long-serving staff member of a New Zealand university students association believed her work was undervalued in the job evaluation that was commissioned by her new manager. The evaluation was conducted by the association's president. After some negotiation, the top of the salary band for the employee's position, set by the manager, was still below her current salary. The manager did not propose reducing the employee's actual salary, but it was clear she could not expect a pay increase in the foreseeable future. A Mediation Service mediator was appointed and a meeting between the parties was arranged. Potential decisions ranged from commissioning a new independent evaluation to accepting the salary band. [For reviewers, outcome options for the conflicts are attached as Reviewer Appendix 2.]

Information came from interviews with the three key people involved. They commented on drafts of my description and made suggestions as to what decisions might have been made at the meeting. I also pre-tested the material using student role players. The student responses led me to change the decision options.

Telco Takeover was a conflict for the ownership of a regional telecommunications provider (*CenturyTel*) that occurred in the U.S.A. during 2001. *Alltel*, a telecommunications company, had been approached by managers of the somewhat smaller *CenturyTel* with an offer to sell *Alltel* their mobile telephone business. *Alltel* managers declined the offer. Shortly afterwards, *Alltel* made an offer to pay 40 percent more than the current share price to buy all of *CenturyTel*. *CenturyTel*'s long-standing chairman was a large shareholder of the company. Managers and staff also owned shares. The *CenturyTel* board was reluctant to sell and took measures to prevent an *Alltel* take-over. *Alltel* appealed directly to outside shareholders of

CenturyTel. The decision to be made was whether a deal would be done and, if so, whether *CenturyTel's*, *Alltel's*, or some intermediate offer would be the basis.

My description of this conflict was based on two articles in *Business Week Online* (Haddad 2001; Kharif 2001) that were written before the conflict was resolved, and on an article in *Wireless NewsFactor* (Wrolstad 2002) that was written after a deal had been concluded. I obtained supporting information from the websites of *Alltel* (www.alltel.com) and of *CenturyTel* (www.centurytel.com). Eric W. Orts provided clarification on the relevant US law².

Water Dispute was a conflict over access to the water of the Euphrates River that occurred in 1975 between Iraq and Syria. Syria had built a dam across the river and started to fill the reservoir, thereby reducing the flow of water into Iraq. Both are arid countries, with Iraq almost completely dependent on the Euphrates for water. The two Soviet-aligned military dictatorships were preparing for war with their troops massing on a common border. Saudi Arabia, in an attempt to mediate a peaceful outcome, called the parties together. The decision to be made was whether Iraq would declare war or go ahead with its threat to bomb the Syrian dam, or whether Syria would release more water voluntarily.

I based the Water Dispute description on an account of the conflict in *Keesing's Contemporary Archives* (1975). Additional information came from Kliot (1994) and from internet searches.

Match with game theorists' preferences

In all, I compare forecasts for eight conflicts. Three are the new ones presented here and five are from Green (2002). Among the eight conflicts one, Artists Protest, could reasonably be classified as an example of *civil unrest*. Two conflicts involved a *new entrant* to a market. They were Distribution Channel, in which an appliance manufacturer sought to sell its wares through supermarkets, and Telco Takeover, in which one corporation attempted to enter a new region by acquiring the major provider. Water Dispute was concerned with access to a *common pool resource*: the waters of the Euphrates River.

Five conflicts involved *concentrated competition, mutual familiarity, and ongoing interaction*. In Artists Protest the Dutch artists' union was, in effect, competing with other citizens, represented by the government, for public funds. The managers in Zenith Investment were competing for resources and status within the corporation. Personal Grievance, 55% Pay Plan, and Nurses Dispute were all employment relationship disputes and, as such, meet the three criteria for inclusion in this game theorist-preferred type.

Match with decision makers' interests

Decision makers who operate in different arenas (industrial, commercial, civil, political, diplomatic, and military) and who interact with different parties (individuals, organisations, and governments) should be able to find familiar situations among the eight conflicts.

Three of the conflicts were industrial (employment relations) disputes. Nurses Dispute was a public dispute over pay and conditions similar to many that are reported in the media. Personal Grievance involved a single employee in conflict with her employer, whereas the other two industrial disputes involved many employees represented by their respective unions.

Distribution Channel, Telco Takeover, and Zenith Investment were commercial conflicts, and Water Dispute was a conflict between national governments. Finally, Artists Protest was a civil conflict.

Distribution Plan, 55% Pay Plan, Nurses Dispute, and Telco Takeover were conflicts between organisations. Nurses Dispute also involved a third party: an appointed mediator. Zenith Investment was a dispute between individuals, and Water Dispute was between governments. Personal Grievance was a dispute between an individual with a grievance and an organisation. Artists Protest was a dispute between an organisation (an artists union) and a government.

Coding refinements

In his analysis of my findings in Green (2002), Armstrong (2002) excluded the Panalba Drug Policy situation, arguing that as described it did not include interaction with other parties. I have followed that policy here, as my purpose is to compare methods for predicting decisions in conflicts that *do* involve interaction between parties.

In Green (2002), I included an ambiguous game-theorist forecast for Artists Protest. I have excluded that forecast from analysis presented here. The change makes no difference to findings.

Distribution Channel option C is “either A or B”. In Green (2002), I coded C as accurate. In subsequent research, I have coded C as half-right (0.5) and have adopted that practice for analysis presented here. The effect of the change on previous findings is that the game-theorist accuracy for Distribution Channel is 23%, rather than 31%.

Findings

I obtained ten simulated interaction forecasts and between nine and eleven unaided-judgement forecasts for each of the new conflicts using university student participants. I obtained eight forecasts from game theory experts for Water Dispute and seven for the other two conflicts. Eight of the twenty-one game theory experts who provided forecasts reported in Green (2002) also provided forecasts for the new conflicts, as did two game theory experts who had not previously participated. Unlike the students, the game theorists were not paid for their time.

The accuracy of the game-theorist forecasts for the three new conflicts varied from 0% for Telco Takeover to 75% for Water Dispute. This compares with 6% to 50% for the five conflicts in Green (2002) that involved interaction between the parties. Across the three new conflicts, the unweighted average accuracy of the forecasts was 39% compared to 26% for the conflicts in the earlier research. In the case of unaided-judgement, the corresponding figures were 33% (new conflicts) and 27% (earlier research), and for simulated interaction 63% and 61% respectively.

In the following analysis and discussion, I use data from this research combined with data from Green (2002) and Green and Armstrong (2004). Green and Armstrong found an alternative question wording had no effect on the accuracy of novices' forecasts. The data (185 forecasts) are included in analysis as forecasts from novices using their unaided judgement. The relevant evidence from Green and Armstrong (2004) is available at www.conflictforecasting.com. [For the purpose of review, the material is included as Reviewer Appendix 3.]

The forecasts of game theory experts were, in an unweighted average across conflicts, accurate for 31% of forecasts. The accuracy of the game theorists' forecasts was no better than that of novices' unaided-judgement forecasts (32%). Simulated-interaction forecasts were more accurate, at 62% on average, than game-theorist forecasts, unaided-judgement forecasts, and

chance for all eight conflicts (Table 1). The difference in accuracy between simulated-interaction and game-theorist forecasts is unlikely to have arisen by chance ($P = 0.004$, one-tailed permutation test for paired replicates; Siegel and Castellan 1988).

Place Table 1 about here.

Table 1

Accuracy of forecasts, combined data ^a

Percent correct ^b (number of) forecasts

	Chance	Unaided judgement by novices	Game theory experts	Simulated interaction with novices
Artists Protest	17	5 (60)	6 (17)	29 (14)
Distribution Channel	33	15 (68)	23 (13)	75 (12)
55% Pay Plan	25	16 (38)	29 (17)	60 (10)
Telco Takeover	25	29 (34)	0 (7)	40 (10)
Personal Grievance	25	35 (31)	43 (7)	60 (10)
Zenith Investment	33	36 (43)	22 (18)	59 (17)
Water Dispute	33	51 (35)	75 (8)	90 (10)
Nurses Dispute	33	65 (45)	50 (14)	82 (22)
Averages (unweighted)	28	32 (354)	31 (101)	62 (105)

^a Includes data from Green (2002) and Green & Armstrong (2004).

^b Figures in bold indicate the most accurate forecasts for each conflict.

The simulated-interaction forecasts provided substantial error reduction relative to game-theorist forecasts for each of the conflicts. I calculated error reduction as the difference between error from game-theorist forecasts and error from simulated-interaction forecasts, expressed as a percentage of error from game-theorist forecasts³. Error reduction ranged between 24% (Artists Protest) and 68% (Distribution Channel), and averaged 47% across the conflicts.

The findings are at odds with expectations. Recall that people expected game-theorist forecasts to be more accurate than simulated-interaction forecasts from novice role players.

Effect of experience and time spent on accuracy

Green (2002) found that game theorists with more years of experience were not more accurate than those with fewer. The finding holds for the larger set of data presented here. For the forecasts of each of the 17 game theorists who provided three or more forecasts, I calculated the error reduction versus the game-theorist average error reduction for matching conflicts. On that basis, there was no correlation between the experience of the game theorists and the accuracy (error reduction) of their forecasts (Kendall rank-order correlation coefficient $T = -0.08$). Put another way, 38% ($n=27$) of the forecasts of game theorists with fewer than five years experience were accurate when averaged across the conflicts, compared to 29% ($n=74$) for those with more experience. Overall, experience ranged from none to thirty years, with a mean of eleven years and median of six.

Spending more time making a prediction also did not improve game-theorist forecast accuracy. I allocated forecasts into five groups such that each group included a similar number of forecasts. The upper limits of the groups were: 10, 20, 30, and 59 minutes. For each group, I calculated the error reduction versus the game-theorist average accuracy for matching conflicts.

The correlation between the average time spent forecasting and the error reduction of the five groups' forecasts was negative (Kendall rank-order correlation coefficient $T = -0.40$). Moreover, 34% (n=68) of forecasts by game theorists who took less than 40 minutes were accurate when averaged across the conflicts, compared to 30% (n=29) for those who took longer.

Determining accuracy

Sometimes the set of potential decisions in a conflict situation is clear and the decision that is made is unambiguous. For example, in Zenith Investment (which was used in the original study) the choice facing the decision-makers was whether or not to invest in expensive new technology and, if so, whether to invest in one new plant or two. In other situations, such as Personal Grievance, this was not the case. Specifically, two, perhaps three, of the four decision options provided to participants could reasonably be interpreted as at least partly accurate representations of the actual outcome. Even when the actual decision maps perfectly onto one of the decision options provided to participants (as with Zenith) it is possible that forecasts that are not entirely accurate may nevertheless still be useful. For example, in the case of Zenith, given that two new plants were purchased, a forecast of "one new plant" would have been more useful to the plant-maker's planners than a forecast of none.

I recruited a convenience sample of five raters, and sent each of them a questionnaire by email. The questionnaire asked the raters to read descriptions of the actual decisions that were made in the eight conflicts used in this research. After reading the actual decisions, they rated for usefulness, on a zero-to-ten scale, the decision options that had been provided to research participants. The raters were told that a decision option that matched the actual decision should be given a rating of 10, a decision that was the opposite of the actual decision should be rated

zero, and other decisions should be given some intermediate value. The instructions given to the raters are appended together with one rater's responses for one of the conflicts as an illustration.

The raters each rated the 31 decision options provided for the eight conflicts. The level of agreement between the raters was modest but unlikely to have arisen by chance (Kappa coefficient of agreement $K = 0.249$, $z = 7.89$, $P < 0.001$; Siegel and Castellan 1988). The coefficient K can take on any value between zero and one: zero where there is no more than chance agreement and one where there is complete agreement.

I gave a usefulness rating equal to the median rating to each option. By using medians, I avoided the influence of outlier ratings (quirky interpretations by raters). The use of medians also had the desirable result that decision options rated 10 by a majority of raters received a usefulness rating of 10.

Interestingly, in the cases of Personal Grievance, Nurses Dispute, and Water Dispute, none of the decision options received a median rating of 10. That is, a majority of raters considered none of the options for these conflicts entirely matched the decisions that were actually made. I did not expect this result for Nurses Dispute and Water Dispute but, as earlier discussion suggests, I did for Personal Grievance. In the case of Nurses Dispute, raters who did not give any of the options a rating of 10 argued that the option I considered a match with the actual decision was incomplete. Specifically, they wrote that the option was: "incomplete in that it does not give information about 'where the parties met' "; "literally correct, but 'wishy-washy' (vague)"; and "a compromise is a subtle thing". In the case of Water Dispute, raters argued that the option I considered matched the actual decision: "...implies that the amount will be sufficient to meet the needs – which is not stated in the actual decision"; "explains that Midistan will release water, but doesn't say how"; and "reflects part of what happened".

Usefulness assessment

In the conventional analysis of accuracy presented in the previous section and the Table 1 data, individual forecasts were either accurate (the option chosen was the one with the highest rating), or not⁴. Might analysis using a broader definition of forecast value, such as usefulness, lead to a different conclusion about the relative worth of game-theorist and simulated-interaction forecasts? To answer this question, I assigned each forecast the usefulness rating corresponding to the decision that was forecast and compared average usefulness ratings for each of the conflicts.

Simulated-interaction forecasts were more useful than game-theorist forecasts for every conflict, with an average usefulness 6.6 versus 4.3 on the ten-point scale. The average expected usefulness of decisions chosen at random was 4.1.

Thus simulated-interaction forecasts were superior to game-theorist forecasts whether one looks at usefulness or accuracy. The correlation between the two measures was modest (Kendall rank-order correlation coefficient $T = 0.50$, $P = 0.054$, $N = 8$, one-tailed).

Summary and conclusions

Findings presented here include 22 new game-theorist forecasts, 30 new unaided-judgement forecasts, and 30 new simulated-interaction forecasts. Most importantly, there are now forecasts for three new conflicts, bringing the total number to eight. This fact should increase our confidence that the findings can be generalised.

I selected conflict situations that matched the types of situations game theorists make predictions about. People Scott Armstrong and I surveyed expected game-theorist forecasts to be

more accurate than forecasts from novices using their unaided judgment. This seems reasonable, but did not prove to be the case. Not only were game-theorist forecasts no more accurate than novices' unaided judgements, they were no better than guessing.

Game-theorist forecasts were expected to be more accurate than forecasts from simulated interactions using novices as role players. Surprisingly, then, simulated-interaction forecasts were more accurate than game-theorist forecasts for all eight conflicts, and the method reduced error by an average of 47%.

The findings for the three new conflicts were remarkably consistent with Armstrong's (2002) analysis of my earlier findings.

In many situations, including the ones in this research, accuracy is not always clear-cut. I analysed forecasts from the different methods using independent ratings of forecast usefulness. Although usefulness ratings (on a zero-to-one scale) turned out to be quite different from binary accuracy (zero or one), the conclusions were the same: game theory is not useful for forecasting but simulated interaction is.

Forecasts of people's decisions in conflicts are used to make far-reaching choices about strategy in situations where money and lives are at stake. There is no evidence that game theory can be useful in such situations. Fortunately, there is evidence that accurate forecasts can be obtained from simulated interaction.

More research would be useful to improve our knowledge about how simulated interaction can best be implemented in a variety of situations.

Appendix: Usefulness questionnaire with example response for one conflict

Rating forecast usefulness

This rating task is part of a larger project to investigate the accuracy of forecasts from different methods for predicting decisions made by parties in conflict.

Following this note are sets of options that were judged by experts to be the decisions that might have been made in eight real conflicts. (Although they are all real, most of the conflicts are disguised.) Although every effort was made to ensure that the options were complete and mutually exclusive, in some cases the decision that was actually made does not match exactly any single decision option. Further, from a decision-maker's point of view, a forecast need not always be spot-on to be useful. For example, a forecast in August 2001 that attacks on the West's oil supplies by al Qaeda were imminent would not have been strictly accurate but could have been useful had governments and businesses responded by increasing security.

For each conflict, please read the brief description of the actual outcome then use your judgement to rate (on a scale of zero to 10) each of the decision options that were provided to forecasters. Using the September 11th example, a forecast that al Qaeda would *never* attack targets in the US should be given a score of *zero*, whereas a forecast that, within one month, they would use passenger planes to attack targets in New York and Washington should be given a score of *10*. The "attack on oil supplies" forecast described in the previous paragraph should be given a usefulness score *between* zero and 10. Note that your ratings of the decision options for any one conflict don't have to add to 10, or to any other number. In other words: rate each option independently.

You have about three minutes for each conflict.

55% Pay Plan

Forecasters were asked: Will there be a strike?

Actual decision: NFL players went on strike for most of the regular season.

Please rate how useful each of these decision options would have been as a forecast

(Usefulness: 0 to 10)

- | | | |
|-----|---|--------|
| (A) | Yes, a long strike
($\frac{1}{2}$ or more of the regular season games will be missed) | [10] |
| (B) | Yes, a medium length strike
(less than $\frac{1}{2}$ of the regular season games will be affected) | [8] |
| (C) | Yes, a short strike
(only preseason games missed) | [4] |
| (D) | No strike will occur | [0] |

Briefly, what are your reasons for your ratings?

A and B are clear indicators of what actually happened. C would allow for some planning. D is not useful.

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¹ www.nytimes.com at 12:03 AM Eastern Time. The articles considered were headlined in the central (two-column) panel of the page and included all unique articles from the top of the page and under the headings: National, Business, International, Editorials/Op-Ed, Washington, and New York Region.

² Communication from Eric W. Orts, Professor of Legal Studies and Management, The Wharton School, University of Pennsylvania received 21 May 2002.

³ Error reduction figures were calculated as $\{(100 - a_c) - (100 - a_x)\} / (100 - a_c) * 100$, where a_c is the percentage accuracy of the comparison forecasts (or chance) and a_x is the corresponding figure for the forecasts of interest.

⁴ Distribution Channel was an exception, in that option C was “Either A or B”. While there were nominally four options, option C was not counted in calculating the chance of choosing at random the option that coincided with the actual outcome. When C was chosen, the forecast was coded as half-accurate (0.5).

Note to reviewers: The following materials will be placed on www.conflictforecasting.com as part of full-disclosure to aid replication and extensions. The paper is self-contained; there will be no need for other readers to access these materials.

Reviewer Appendix 1

ARTISTS' REPRIEVE

The Country

Histavia is a relatively small country which is also one of the most densely populated nations in the world. It has some energy resources (mostly gas) but very few other natural resources. Farming, fishing and trading have always been important parts of this country's economy. More recently the country has become quite involved in manufacturing with over 40% of the people employed in various industries. The government is renowned for its bureaucracy and for the extravagant systems it puts together. For example, in order to help with the population problem and overcrowding, the government subsidised emigration.

The government is a constitutional monarchy. Executive power lies in a cabinet selected by the majority in Parliament. Histavia's parliament has two houses. The 1st House contains appointed representatives from each province's legislative body. The 2nd House is elected by direct vote and develops all legislation. A bill passed by the 2nd House is sent to the 1st House for a vote.

Artistic Problems

Visual art has always been a very important part of Histavian culture. Three hundred years ago, Histavia's seaports and rivers made it a major trading hub for the surrounding nations. Histavians became relatively wealthy and wanted to chronicle the times. They wanted pictures of themselves, their families, homes, and the countryside. Demand was so great that an artist could specialise in whatever subject she wanted to paint. Out of this environment came some of the world's greatest artists. The Histavian people thus developed a special regard for art and artists.

This prosperity didn't last. The private market for art has been very weak for a long time. There are currently sufficient jobs available for artists but there isn't enough demand for many artists to make a living selling their works. The government feels a compelling need to do something about this problem. Since the private market isn't there, the government feels obliged to protect the artists' financial freedom and thereby to preserve art for the sake of art. Partially to reward artists for their contribution to Histavia's culture and partially because the main artists' union has made a big fuss over the continuing conditions for art, the government has developed a simple programme to keep artists from having to drive taxi cabs. An artist will sign up on the programme for up to a year. During that time the government will buy the artist's wares. Once the artist's time period is up, the artist must sell his works on his own or find another occupation. During the government purchase period, if the artist begins to sell her works in the private market, the government will end its assistance early.

Counterculture

The programme was accepted and seemed to work well for about twenty years. In the late 1960's the counterculture boomed worldwide. Artists in Histavia were particularly upset with the continuing conditions for artists. They felt anyone who said they were an artist was one, and that the programme's length wasn't sufficient time for an artist to get established given the continuing weak demand for art. To press their point, members of the main artists' union occupied the most valuable room of Histavia's primary art museum. They refused to leave until entrance requirements were relaxed and artists were allowed to remain in the programme indefinitely.

Additional Information

- The conflict occurs in the late-1960's
- This is a developed, industrialised country (i.e.; not Third World)
- Not all artists are members of the main union, but union leaders feel they speak for and represent all of Histavia's artists. They also believe they can gain public support for their cause fairly easily.

Current entrance requirements to the programme involve acceptance by the government on the basis of some criteria.

Roles: Histavian Bureaucrats

You are two Histavian bureaucrats responsible for administering the government's programme for purchasing art. You report directly to the executive cabinet, which represents the majority in both Houses and the view of the Queen. The cabinet has given you negotiating power to resolve the artists' sit-in and feels confident it can win support for whatever agreement you reach with the artists. The government and the people are very concerned for the well being of art and artists. The majority party, as always, is concerned with negative public opinion affecting the outcome of the next election. Additionally, the room the artists are holding contains some of the country's most treasured art works. It's your job to negotiate and resolve the issue.

All facts and impressions that are available are given. Extrapolate as necessary.

Roles: Artists' Union Leaders

You are two leaders of the main artists' union and have taken it upon yourselves to represent not only your fellow union members in the room, but all Histavian artists. You know one of the most important things to Histavian people is their art. Still the private demand for art isn't sufficient to support all the artists Histavia's rich culture has inspired. You're meeting with two government agents responsible for administering the current programme. They are influential people who have been sent to resolve the sit-in and have the backing of the majority party in power. Right now you occupy the room in the art museum which contains the country's most treasured art works. You want exit and entrance requirements to the programme relaxed before you'll leave. You feel strongly you represent the viewpoint of all artists and it will be easy to gain public support for your cause.

All facts and impressions that are available are given. Extrapolate as necessary.

DISTRIBUTION PLAN

Background

The year is 1961. The Ace Company has been in business over seventy years and has become a major producer of home appliances. The home appliance industry has had a terrible start this decade. Sales have been weak, inventories are high, dealers are demoralised, and mass merchandisers and foreign competitors have entered the market slashing margins. While the recession seems to have bottomed out by mid-1961, Ace's operating deficit is approaching \$6 million for the year. The company, however, feels the fall introduction of the colour TV set might recover some the loss.

Ace's problems seem to be short term. Some existing new products in the development cycle are draining funds and the year's poor sales has created a cash flow crisis. Now that consumer purchases are picking up, funds aren't available for heavy promotion and prices are still soft due to foreign competition and excess inventories. One component of the marketing mix can be attacked – distribution.

Appliance Discount Plan

Competition between supermarkets for customers has always been heavy. Discount houses are opening up and every store seems to be giving trading stamps or running some kind of promotion. Ace feels it has come up with an excellent new distribution plan that will make everyone involved happy and return much needed appliance sales. It's called the Cash Register Tape Plan (CRTP). An Ace dealer will link up with an area supermarket. The supermarket will be given an exclusive contract in return for floor space to display some major appliances. The dealer will supply a sales person to explain the appliances and show pictures of items not on display. A shopper accepted by Ace Financing receives a 12-36 month, no down payment instalment plan and has the item immediately delivered by the dealer. Each month the purchasers bring in their cash register tapes from that supermarket. Five and a half percent of the tape total is taken off the monthly instalment (up to 75% of the payment). The payment of the monthly discount is split between Ace and the supermarket based on a sliding scale. If a shopper purchases less than \$50, Ace pays the full 5½%. If she purchases more than \$120, then Ace pays 2½% and the supermarket 3%.

The CRTP is designed to benefit all those involved. Naturally Ace and their dealers expect to enjoy increased sales. The shopper will get a reduced price on a major appliance by altering purchasing habits. The supermarket should be able to reduce split market shopping, increase purchases by regular customers of items often purchased elsewhere, obtain new customers, and generally build traffic. There are, however, costs to the plan. Ace receives a lower price, the dealer has a salesperson at a remote location, the customer won't be able to "shop around" for the lowest prices and the supermarket has to give up floor space and pay part of the discount.

Selection Process

Ace wants to deal with regional chains. This strategy will require getting agreement from only one source (per regional market) before they're able to start up the CRTP in the metropolitan areas they've selected. Expansion to additional cities will also be easily accommodated. Ace will select the dealers who will participate based on their proximity to the individual stores selected to participate from the supermarket chains. Both the dealer and the supermarket must be approved by Ace Financing before they can join the CRTP. Dealers not near a selected supermarket or in a region not selected for the plan won't participate. If dealerships overlap a supermarket's territory they will sell in the stores on alternate days.

Additional Information

- Ace carries a full line of major household appliances and is a well-known national manufacturer.
- Small appliances (like toasters) have been sold through supermarkets as promotion items
- Assume Ace can present some attractive return figures for the supermarket based on the given sliding scale discount payment procedure
- No actual test of the CRTP has been conducted

Roles: ACE Executives

You are the ACE marketing vice-president and the marketing director of the appliance division. You are preparing to meet with the management of BIG VALUE supermarkets (a mid-West grocery store chain). They have been approached about the CRTP, received an outline of the plan, and have agreed to meet with you. In addition, you've sent a market analysis your division pulled together indicating how much a chain like BIG VALUE should profit by participating in the CRTP.

It's your job to sell the CRTP! You see it as a potential saviour for ACE's current problems and a unique distribution tool. You are particularly worried about other stores, dealers, and/or manufacturers copying the CRTP. You want to move as quickly as possible once the programme starts. Obviously the continued sales slump and cash flow problems will negatively reflect on your careers.

All facts and impressions that are available are given. Extrapolate as necessary.

Roles: BIG VALUE Vice-Presidents

You are the two top vice-presidents of BIG VALUE supermarkets, a mid-West, regional grocery store chain. You have agreed to meet with the marketing v-p and marketing director of ACE's appliance division after having received information on ACE's CRTP and a market analysis (from ACE) which projects favourable returns for a store chain like yours. You have also heard about ACE's current problems.

It's your job to discuss the pros and cons of the CRTP for your chain and be prepared to react to the ACE personnel. Ultimately you must decide whether or not to accept the CRTP and in what form. BIG VALUE's top management is aware of the plan and will accept your decision. Positive or negative results of your decision will obviously impact on your career.

All facts and impressions that are available are given. Extrapolate as necessary.

THE 55% PLAN

The collective bargaining agreement between the National Football League (NFL) Management Council and the NFL Players' Association (NFLPA) expires on July 15, 1982. The payers' number one demand is for a fixed percentage of the football clubs' gross revenue. Ed Garvey, the executive director of the NFLPA since 1971, says that 55% of the gross revenue is the players' "bottom line" demand. Jack Dolan, executive director of the Management Council since 1980, rejects the union's demand for a percentage of the gross revenue regardless of what the percentage is.

NFLPA

The players' last contract ended in 1974. The players struck for six weeks during the '74 season but returned to work without a contract to begin playing regular season games. The major issue then was free agency. A free agent is a player who doesn't sign a new contract with his team when the current one expires. Once the contract ends, any team can bid for his services. The owners refused to agree to a free agent system so the NFLPA took the case to federal court and won most of their demands. This decree, however, didn't come until 1976. The final contract was signed in 1977, three years after the last contract expired.

Unrestricted free agency in most sports has caused players' salaries to increase substantially, however this has not happened in football. Of the five hundred players who became free agents since 1977, only six have changed teams. The average salary in the NFL was \$78,000 in 1980 compared with \$108,000 in hockey, \$143,000 in baseball, and \$186,000 in basketball. Garvey insists the poor performance of the free agent system in football occurs because the NFL clubs practice "corporate socialism". All clubs share equally in TV revenues and playoff monies. This ensures even a team with a terrible record will be financially sound. There is, therefore, economic incentive to replace more expensive veterans with less expensive rookies. Others feel Garvey, at least in part, is to blame for the slow movement of free agents. In the '77 contract, the union agreed to compensation procedures for a team losing a free agent. Many feel the nature and magnitude of the compensation restricts free agency to the point where no club is willing to sign a good free agent. They point to the case when one of the best running backs became a free agent and not one club made him an offer.

The 55% plan is designed to increase all players' salaries and provide incentive bonuses for excellent playing. Some of the higher paid players, however, may not benefit very much under the proposed method for distributing the wages. This plan will also eliminate the individual contracts negotiated by the teams with each player and, in effect, make the players' agents obsolete. As for the players' unity and their resolve to attain the 55% plan, Garvey feels virtually every player is ready to strike and there is no comparison between the situations in 1974 and 1982.

All players now belong to the NFLPA. Communication with the dispersed membership is vastly improved—players and their wives have been thoroughly briefed on the 55% plan, and there will be a union meeting in mid-March to iron out all the details of the wage distribution. The AFL-CIO has been asked to provide assistance from the entire labour community and a battle cry is being sounded in a 20 minute film featuring popular sports and entertainment personalities.

NFL Management Council

While Dolan is the new kid on the block, he's no rookie. As a senior vice-president of industrial relations for nine years with National Airlines, he negotiated contracts with eight unions and went through four strikes. Dolan consults with six owners who make up the council's executive committee. All, except one, are described as "hard liners".

To the owners, a fixed percentage is equated with control and the owners "are not going to let the union run their business". They deny Garvey's contention they have no incentive to win because of the leagues financial structure. Besides being successful businesspeople who want their clubs to do the best they can, the team's won-lost record effects the price owners can charge for tickets, the demand for luxury boxes, and the amount of money lost from concessions because of no shows. From the union's own estimates, the LA Rams had \$7.7 million in profits for 1980 while the Denver Broncos had \$2.5 million.

The council feels Garvey will have trouble gaining public sentiment and maintaining rank and file support for such an unorthodox plan. In addition, their pre-contract strategy appears to be to build a lack of confidence in Garvey, so it will be difficult for him to maintain players' support for a strike. People either love Garvey or hate him. His shoot from the hip, wisecracking style often leaves a trail of damning quotes. The NFL Management Council uses a monthly newsletter to "their employees" and the sports press to present Garvey's quotes and actions in the worst light. Dolan is intent on using these weaknesses to stop any attempt to have a fixed percentage of gross revenues as the collective bargaining agreement's wage clause. Estimates of the percentage of gross revenues currently going to the players are between 25% and 45%. Naturally the NFLPA claims the figure is between 25-30% and the NFL Management Council places it near 45%.

Additional Information

- Current compensation losing a free agent is by way of draft choices, i.e. if the player's salary is greater than \$x, the team signing the free agent loses two 1st round draft choices. A draft choice is a team's right to select a player from a list of all available college players. Teams take turns to pick, with the weakest team choosing first and so on.
- The percentage of gross revenues will go into one pool, which the NFLPA will distribute based on a base salary plus incentive bonuses.

Roles: Management & Owner Representatives

You are the executive director and the head owner representative of the NFL Management Council. You are about to meet with the NFLPA to decide the 55% issue. You both hold very strongly to the statements attributed to the owners and view the NFLPA comments as "hogwash" and propaganda. Prepare and defend your position for the upcoming negotiation.

All facts and impressions that are available are given. Extrapolate as necessary.

Roles: Player Representatives

You are the executive director and the head player representative of the NFLPA. You are about to meet with the Management Council to negotiate and decide the 55% issues. You both hold very strongly to the statements attributed to the NFLPA and view the owners' comments as "hogwash" and propaganda. Prepare and defend your position.

All facts and impressions that are available are given. Extrapolate as necessary.

A Pay Dispute Between City Wide Health and Nursing Staff

City Wide Health Ltd is a government-owned Hospital and Health Service.

The Government funds CWH primarily by purchasing a set level of health services, for example so many hip operations. The level of funding is based on what the Health Funding Authority has calculated are reasonable prices to pay for the services the Government wishes to purchase.

It is the responsibility of the CWH Chief Executive, Hillary Strong, to manage the company's affairs so that it can deliver the services it has contracted to provide while remaining financially viable. CWH's 2000/2001 contract with the HFA is worth \$258 million, an increase of nearly 10% over the previous year's contract; this reflects both some price increases and some increase in services provided. There are more than 3,000 staff, and payroll costs are more than \$140 million per year – over half of the value of the HFA contract. CWH employs nearly 1300 full time equivalent nurses; their pay costs roughly \$55 million per year. The collective employment contract many of the nurses are party to has expired and the nurses and management are currently involved in a dispute over their pay.

The National Nurses Organisation (NNO) represents more than half of the nurses employed by CWH. The nurses are angry. They consider that they have borne the brunt of budget constraints over the years and that their dedication to their profession has been exploited. Perhaps as a consequence of this, the turnover of nurses is high – as many as one-third of nurses leave CWH during the course of a year, often taking up highly paid nursing jobs overseas.

Some specialist nurses are more difficult to replace than others. Earlier this year, Intensive Care nurses obtained a 7% pay increase from CWH. Junior doctors also obtained a large pay increase in separate negotiations. With these precedents, nurses instructed NNO to retract the bid they made in February for a 5% pay increase and instead seek 7% on all salaries and allowances for the 12 months from 1 October. In addition, the NNO are seeking substantial increases in penal rate multipliers, meal, night and weekend allowances, study and long-service leave provisions, and reimbursement of professional association costs.

Hillary Strong and the CWH negotiation team, led by Mark Jensen, have now offered the nurses a 5% pay rise with no new contract for 2 years and have stated that this is most the company can afford. At a stop-work meeting nurses rejected the 5% offer and voted almost unanimously in support of holding a 16 hour strike on Sunday, October the 1st. Nurses at the meeting criticised NNO negotiators for being too willing to compromise. The nurses gave NNO negotiators Jack Naylor, Fergus Black, and the rest of the team clear instructions “not to come back” without an agreement for at least a 7% increase.

The two sides are at odds in their interpretation of CWH's ability to afford a 7% increase. CWH has been struggling to reduce debt levels by reducing costs, increasing efficiency, and only providing services it is funded to provide. The Government requires CWH to break-even, and the CWH negotiators claim that even a 5% pay increase would result in a deficit if cost savings cannot be found elsewhere. The NNO, on the other hand, maintains that CWH is effectively receiving a bonus from the HFA when they are paid for additional procedures. This is because providing an *additional* procedure of a type CWH is already providing does not cost as much as the standard price per procedure the HFA pays. Moreover, NNO claims that a 2.5% “creep” in salaries that CWH has budgeted for will not occur due to the current composition of the nursing workforce and the high attrition rate. Creep occurs when staff receive increases in salary that are related to their length of service. The NNO position is that the “bonus” revenue that will accrue from payments for additional procedures and the absence of creep are sufficient to meet the \$1.1m difference between CWH's 5% offer and the nurses' 7% claim.

Both parties have a lot at stake. Hillary Strong's performance is assessed, in part, on her financial management of CWH, while the nurses are prepared to go on strike in support of their strongly held belief that they deserve a 7% pay increase. Meanwhile, the Minister of Health has been sending mixed signals to the two parties about what might be an appropriate settlement and has also stated that the Government will *not* become involved in the dispute.

Assume it is now Monday the 2nd of October. The Sunday strike is over and the two parties are about to recommence negotiations for a settlement of the dispute. If in impasse in negotiations is reached Stephen Worley, an independent mediator from the Government's new Mediation Service, will be appointed. Stephen will briefly interview each party separately and will then endeavour to mediate an agreement. The dispute will be resolved, but after how long and with what terms?

Hillary Strong, Chief Executive of City Wide Health

Hillary Strong trained and worked as a nurse, but has an MBA and has for some years held senior management positions. Most recently, before taking up the appointment at CWH, she was the Chief Executive of another health provider. It was her success in that position that made her a strong candidate for the position she currently holds.

Her role is not easy, and probably rather thankless. Government expects her to run CWH as a business in many ways but, in reality, it is neither fish nor fowl. She is faced with political pressures and with the fact that many people, including many nurses, do not believe that hospitals really are, or should be, businesses. In this ambiguous environment, she is obliged to keep within her budget while ensuring that the hospitals continue to run as smoothly as possible. Hillary has a good working relationship with Mark Jensen, her chief negotiator. She has used him and his company for advice with labour relations and human resource matters for many years.

Mark Jensen, City Wide Health Negotiator

Mark Jensen is a seasoned industrial negotiator and human resources expert with his own successful business. He has a lot of experience in the health sector. Mark has a direct and pragmatic style and, like Hillary, has quite a lot of sympathy for the nurses. He is, however, employed by CWH and his role is to help Hillary Strong by negotiating an agreement with the nurses' representatives that is consistent with achieving a healthy financial position for CWH without undermining CWH's role as a health services provider.

Jack Naylor, New Zealand Nurses Organisation Organiser

Jack Naylor is a seasoned industrial negotiator and union organiser. Before taking up his present job, he worked for a major public sector employees union. Jack's current role is to represent the interests and wishes of the nurses employed by CWH who are members of the NNO, the nurses' union. This includes organising the nurses to take effective protest and strike action. Jack and his team negotiate on their behalf in order to get the best possible deal for them. Because he is dealing with the CWH managers and negotiators a lot, he understands their point of view, perhaps better than most members, and has developed a good working relationship with them. At the end of the day, however, he can only make recommendations to the nurses. It is they who will decide whether to accept or reject a pay offer and whether or not they will go on strike or take other action. Feelings are running high in this dispute and there is every sign that the nurses are determined to take further action if necessary.

Jack has an open style and believes in the cause of his members. He is being assisted in the current round of negotiations by Fergus Black. Fergus is a senior nurse, and a real asset to the negotiating team.

Fergus Black, Nurse and Negotiator

Fergus is an experienced nurse who has relatively recently returned home after a number of years abroad. He was very well paid working as a nurse overseas. The contrast with the poor situation of nurses locally is marked. As well as working as a nurse for City Wide Health, Fergus is currently helping the NNO, as a negotiator in the pay dispute. He represents the interests and wishes of the nurses employed by CWH who are members of the union.

Stephen Worley, independent mediator, Mediation Service

Stephen Worley may be asked to act as mediator in the dispute.

His role as mediator would be to:

- control the process
- ensure that each party states their case
- help the parties to identify issues and options for settlement
- look for a solution that will satisfy the needs & interests of both parties
- record the agreement in writing

The Mediation Service web-site includes the following information on mediation:

“Mediators will help the parties decide on the process that is most likely to resolve problems as quickly and fairly as possible.” *and*

“If the employer and employee cannot reach agreement in mediation, they can agree, in writing, to the mediator making a final and binding decision.

The mediator will explain to the parties that once he or she makes a decision, that decision cannot be challenged. The mediator's decision is enforceable...”

What's the job worth?

In New Zealand universities most students belong to a students association to which they contribute financially. The University of Nelson Students Association (UNSA) is one such association. Each year, students elect fellow students to form the UNSA Executive. The Executive is responsible for the representation of students' collective and individual interests (services), and for operating the facilities such as venues, recreation centre, book shop, cafes, and bars that are owned by UNSA (trading). Day-to-day, services and trading activities are carried out by the 150 staff employed by UNSA. The members of the Executive are not professional managers. This had caused problems with the management of UNSA's permanent staff in the past. Wishing to avoid such problems in future, the Executive decided to restructure the organisation and employ a professional general manager to take primary responsibility for UNSA trading and services.

The young new General Manager, Dave Sanders, started work on 3 May 2000. Dave's background was in large private sector corporations. On top of learning a new job, he was responsible for restructuring the organisation and renegotiating contracts with major suppliers and the University. He was also straight away involved in pay negotiations with nearly half of the UNSA staff. Some of the staff (five of the eight services staff) belonged to the university staff union — the Association of University Staff or AUS. Services staff contracts had expired in 1998 and Arty Cruickshank, the local AUS representative had written to Dave the day before he started work at UNSA seeking a meeting to discuss renegotiation of the five AUS members' contracts. Dave telephoned Arty on 4 May and they arranged to meet on 9 May.

At the meeting, Arty proposed that his members' salary bands be reviewed. He suggested that either UNSA adopt the University's general staff job evaluation process and the associated salary bands or that UNSA undertake a formal review of the positions. Dave asked for time to consider this matter and to familiarise himself with the roles of the services staff. After further consideration Dave decided that the University's process and salary bands were not appropriate for UNSA staff and, besides, the University HR department weren't prepared to do the evaluation for UNSA. Arty was informed of this by 23 May, and the possibility of getting an independent assessment was discussed by Dave and Arty. Arty wrote that staff were keen on the idea, but suggested that both they and the AUS should be allowed to examine the proposed process in order to assess its fairness.

In early June, Dave gave *all* salaried staff a backdated 2% pay increase in recognition of the delays that had occurred in pay negotiations prior to his arrival. A memo to this effect was circulated on 20 June. The memo told staff to update their position descriptions and forward them to Dave before 30 June 2000 so that a formal review of the positions and performance of staff could be conducted. Arty phoned Dave wondering about progress with the independent assessment and was informed by Dave that he had spoken to an independent HR consultant who had advised him that UNSA first needed to make sure the position descriptions were consistent with the current needs of the organisation. In the event, the full set of position descriptions was not available until mid-August at which point Dave informed Arty that he and UNSA President Gerald Sullivan were in the process of reviewing the descriptions. In late-August, Dave and Gerald met with each staff member individually to discuss their position descriptions before finalising them.

On 19 October, Dave advised Arty that Gerald had undertaken the evaluation by comparing positions and salary bands with those of other student associations. The resulting bands were higher than those of other associations reflecting management's ambition that UNSA should be the top association in NZ. Dave presented the salary bands to Arty and the staff on 9 November and it was agreed that Dave would explain the bands to individual staff. He did this on 23 November and the parties met again on 21 December. Arty told Dave that the staff considered comparison with the other associations was inappropriate and that the salary bands should be wider. Arty proposed comparisons with positions that the staff considered to be more relevant. Dave agreed to consider these submissions.

Dave, Arty, and services staff met again on 8 February 2001 to discuss the comparisons. Some changes were agreed to. Arty complained on behalf of staff over the time taken to deal with this matter and Dave responded by reminding Arty that he had considerable demands on his time, had given a backdated pay increase soon after taking on the job and that he would make a final decision on salary bands within one week. He said that UNSA could not afford to move substantially on salaries. On 14 February, Dave wrote to Arty informing him of the new salary bands that UNSA had decided on. The letter stated the bands had been set after careful deliberation that included consideration of the arguments put forward by Arty as well as UNSA's ability to pay and ability to recruit. Dave's letter noted that the salary band for one position had been increased and the upper limit of all bands had been increased by \$2,000 from the figures presented to Arty on 9 November the previous year. Dave met with staff and informed them of the outcome of the review.

Despite the increases, the new upper salary limit for the position held by one senior and very experienced staff member, Education Co-ordinator Freda Thornley, was less than she was currently being paid. Freda's role is to ensure that students' education interests are represented to the university. The role involves advice, advocacy, communication, counselling, liaison, organisation, and research. Freda has held the position for 12 years and has a great deal of institutional knowledge as well as established relationships with the academic staff of the University. Dave did not propose reducing Freda's (or any other employee's) salary, but it was clear that she should not expect any pay rise in future.

Nearly one month later, Arty informed Dave that Freda and her assistant did not consider that the evaluation of their positions had been conducted properly and, consequently, had been undervalued. Arty raised the matter with the Employment Relations Authority. The Authority directed the parties to meet with the Mediation Service's Mel Morrissey on 24 April with the purpose of resolving differences over the position evaluation process. For equity reasons, any new evaluation would need to include all services staff. Dave Sanders will attend the meeting with employment lawyer Linda Lachlan and Freda Thornley will attend with AUS representative Arty Cruickshank.

Dave Sanders, General Manager

You were appointed to the new position of General Manager of the University of Nelson Students Association (UNSA) 18 months ago in May 2000. You have previously worked as a manager in large private sector corporations. You had taken on quite a challenge as, on top of familiarising yourself with a very different organisation to the ones you were used to, you were faced with restructuring the organisation, with building relationships with your board (the student Executive), with staff, with the University, and with suppliers.

UNSA's revenue comes partly from trading activities and partly from student fees. Before you took up your new position, the University had negotiated with an earlier student Executive to reduce the fee per student that was paid to UNSA. As a result, when you took on UNSA it had just made its first ever annual loss. You are determined to return UNSA to profitability, and establish it as a model student association run in a professional manner for the benefit of University of Nelson students. You must balance the limitations of a tight budget with the need to pay salaries that will be attractive to capable people. After conducting an evaluation, UNSA is offering salary bands that are higher than other associations. Despite this, a handful of staff want more. You believe this group's bands are generous not only relative to similar positions in other organisations, but also relative to those of other UNSA employees who have more important roles with responsibility for more staff and bigger budgets. You aren't prepared to make exceptions for this group, as that would leave other staff feeling cheated.

Freda Thornley, Education Co-ordinator

You are the Education Co-ordinator of the University of Nelson Students Association (UNSA), a position you have held for many years. You represent students' education interests to the University and provide advice and support to students. Few people in UNSA seem to know or care what it is that you and your assistant do, and yet you perform a key function of UNSA very well with limited resources. You have developed a broad network of relationships with people in the University and a comprehensive institutional knowledge. The better the job you do the more in demand you are and, consequently, the more pressure you are under. You seldom have time for lunch breaks and never for morning or afternoon tea. You do not believe that you are paid adequately for the role you perform.

In the past you reported directly to an elected student President and Executive. This relationship often involved a lot of hand-holding by you as the student representatives are typically inexperienced. This situation changed recently with the appointment of a professional manager.

Arty Cruickshank, union organiser

You are an organiser for the Association of University Staff (AUS). Your role is to look after the interests of members working at the University of Nelson. You are also responsible for five members who work for the University of Nelson Students Association, which is on campus but independent of the University. You represent AUS members in the negotiation of collective agreements with their employer, and you also represent individual members if they have a grievance or become involved in a dispute. **Mediation:** You are aware from previous experience that the objective of mediation is to provide each party with the opportunity to state their case, identify the issues behind their employment relationship problem, identify options for settlement and to attempt to reach a solution that satisfies the needs and interests of both parties. A mediator will control the mediation process to ensure that each party is able to participate, and will record the outcome of the mediation if the parties reach a settlement.

Linda Lachlan, employment lawyer

You are an employment lawyer with the local employers association. Your role is to advise member employers on their rights and obligations under the law and, if requested, to advise and represent members should they become involved in a dispute with an employee. You have formed the view that the employer has conducted a fair process.

Mediation: You are aware from previous experience ...

Mel Morrissey, Mediator

You are a mediator with the Department of Labour's Mediation Service. Your role is to: control the mediation process, ensure that each party states their case, help the parties to identify issues and options for settlement, look for a solution that will satisfy the needs & interests of both parties, record the agreement in writing.

Telco Takeover Bid

In mid-August 2001, the Localville Telco board rejected an unsolicited \$6 billion offer for the company from rival telecommunications operator, Expander Telco. The companies are relatively small but profitable players in the huge US market. Both companies specialize in providing services to rural areas that have so far avoided the attentions of the giants. Localville's rejection of the offer is not the end of the matter. Expander's \$43-per-share offer is more than 40% above Localville's pre-bid share price of around \$30.

Localville grew from small beginnings under the care of current Chairman, Augustus Lovett, who has headed the company for several decades and remains a substantial shareholder. The company's managers and employees (including Chairman Lovett) between them own 30% of Localville's voting stock and, of the 14 board members, five are current or former employees. Localville is based in a small rural town and many of its 7,000 employees live in the area and take pride in participating in community affairs. Chairman Lovett has served as mayor and has sat on local community boards over the years. A takeover by Expander would lead to major layoffs in a community that has benefited from several generations of employment at Localville.

Expander's annual turnover of \$7.5 billion is three times that of Localville at \$2.5 billion. Although the companies both offer local (landline or wireline) and mobile (wireless or cell-phone) phone services, their service mixes are quite different. Expander has 6.7 million mobile and 2.6 million landline customers, while Localville has 0.8 million mobile and 1.8 million landline customers. Through an arrangement with one of the industry giants, Expander provides national roaming (mobile customers can make and receive calls from anywhere in the US) and can provide flat-rate national calling to mobile customers at cost. Expander has mobile penetration averaging 13% across its territories, and achieves a 61% margin on its mobile operations. Localville does not have a national roaming arrangement, its penetration is less than 10%, its margin is 54%, and its mobile revenues are flat — falling nearly 1.5% in the second quarter. In fact, shortly before Expander made its offer to buy Localville, Localville had approached Expander to assess the rival company's interest in purchasing Localville's mobile operation. Expander rejected the proposition, as company policy is to offer a comprehensive service, including local calls, when moving into a new territory.

Expander's father and son team, Chairman Al Exley and CEO Brad Exley, have acquired more than 250 companies over the last 15 years, and have spent \$12 billion on acquisitions during the last three. Localville's footprint (the geographical spread of its customers and potential customers) complements Expander's. Expander's analysis suggests that economies of scale resulting from the purchase of Localville should amount to \$100 million (1% on combined revenue of \$10 billion). There would be further gains from lifting the financial performance of Localville operations to the levels achieved by the current Expander operations. As well as these advantages, in the longer term the enlarged Expander may present an attractive acquisition for a major operator willing to pay a premium in order to gain a regional customer base.

Localville has told analysts that the company doesn't need to sell-out to Expander in order to provide a good return to shareholders. Localville maintains that revenue growth from the company's landline business will exceed that of Expander. Nevertheless, the prospects for the mobile side of Localville's business — responsible for roughly 20% of revenue — concerns shareholders. Without national roaming agreements, Localville can't offer the cheap flat-rate national calling deals that customers are increasingly demanding. Localville's strategy of selling the mobile operation and expanding the business as a landline operator is considered by some analysts to offer the best deal for shareholders. The Localville board are adamant that the company is happy to talk to Expander only about selling its mobile operation. It is unlikely that the board could be forced to change its stance by non-employee shareholders who are keen to accept Expander's offer: Localville doesn't have to hold a shareholder meeting for another three months and company rules make it impossible to oust the whole board at one time. Although it is possible under US law to bypass the company board and make an offer directly to shareholders, the process is restricted by regulation and, even if Expander acquired more than 50% of Localville stock, the current board could remain in effective control of the company for some time. Localville released the following statement on mobile services: "...divestiture efforts have been adversely affected by a hostile takeover attempt... and a recent sharp decline in the general mobile market... we continue to believe that divestiture makes strategic sense and we continue to pursue that goal. Nevertheless, mobile generates strong cash flows for Localville and so we do not feel compelled to divest until we are presented with the right offer".

It is now September, 2001. Despite Localville's rejection, Expander hasn't given up on buying the Localville company. Expander knew that the Localville board was not interested in selling the whole company when it first made its bid. Institutional investors and other non-employee shareholders of Localville are not happy with the board's rejection of Expander's offer and this has put pressure on Localville management to find a credible solution to the company's current performance woes. The stand-off between Expander and Localville must be resolved. In which one of the following four ways will this happen?

1. Expander's takeover bid fails completely
2. Expander purchases Localville's mobile operation only
3. Expander's takeover succeeds at, or close to, their August 14 offer price of \$43-per-share
4. Expander's takeover succeeds at a substantial premium over the August 14 offer price

Role of Localville Telco Chairman – Augustus Lovett

Several decades ago you became Chairman of Localville, a small telephone company founded by your grandfather. Since then you have built the company into a \$US 2.5 billion business. Despite the substantial size of the business, the company head office and many employees remain in the small town where you live and where the company had its beginnings.

Although Localville offers both local and mobile telephone services, mobile users have come to expect to be able to use their phones anywhere in the US for the same (cheap) rate. Localville has not been able to obtain a roaming agreement with one of the major telecommunications companies that would allow the company to offer this service. Recently, Localville approached Expander Telco to explore the possibility of selling Localville's mobile business to Expander. Expander rejected this idea, and offered to buy the whole of Localville. You and the board do not wish to sell the whole business as you believe Localville can do better for shareholders as a provider of local telephone services and, at the same time, protect your employees and the local community. Not all shareholders agree, however, and you and your CEO, Bill Lowe, have a tough fight on your hands to keep Localville safe from Expander's hostile takeover bid.

Role of Localville Telco CEO – Bill Lowe

Localville is small (by US standards) telephone company with a turnover of \$US 2.5 billion. Localville offers both local and mobile telephone services, but mobile users have come to expect to be able to use their phones anywhere in the US for the same (cheap) rate. Localville has not been able to obtain a roaming agreement with one of the major telecommunications companies that would allow the company to offer this service. Recently, Localville approached Expander Telco to explore the possibility of selling Localville's mobile business to Expander. Expander rejected this idea, and instead offered to buy the whole of Localville. The Localville board does not wish to sell the whole business as the directors believe Localville can do better for shareholders as a provider of local telephone services and, at the same time, protect Localville employees and the local community. Not all shareholders agree, however, and you and your Chairman, Augustus Lovett, have a tough fight on your hands to keep Localville safe from Expander's hostile takeover bid. In common with many employees, you own shares in Localville.

Role of Expander Telco Chairman – Al Exley

Under your leadership for the past 15 years, telephone company Expander has grown rapidly with the acquisition of more than 250 companies. Recently, Expander was approached by Localville Telco. Localville wished to explore the possibility of selling its mobile phone business to Expander. You rejected the proposition, as Expander's policy is to be able to offer local telephone services as well as mobile when it moves into a new territory. Localville as a whole, however, would be an attractive acquisition (the companies' territories are complementary) and Expander has offered to buy Localville at a price-per-share that was 40% higher than the price prevailing at the time of the offer. So far, the Localville board has rejected this offer, but you and your son (Expander CEO, Brad Exley) believe Localville is a prize worth fighting for.

Role of Expander Telco CEO – Brad Exley

Under the leadership of your father (Chairman Al Exley) for the past 15 years, telephone company Expander has grown rapidly with the acquisition of more than 250 companies. Recently, Expander was approached by Localville Telco. Localville wished to explore the possibility of selling its mobile phone business to Expander. Expander rejected the proposition, as company policy is to be able to offer local telephone services as well as mobile when it moves into a new territory. Localville as a whole, however, would be an attractive acquisition (the companies' territories are complementary) and Expander has offered to buy Localville at a price-per-share that was 40% higher than the price prevailing at the time of the offer. So far, the Localville board has rejected this offer, but you and your father believe Localville is a prize worth fighting for.

International Water Dispute

Today is June 3, 1975. Two poor and arid Asian countries, Midistan and Deltaland, are in dispute over access to the waters of the River Fluvium. The river rises in Uplandia, whose plentiful rain contributes at least 90% of the flow. It then runs through Midistan — where the scanty rainfall makes up the rest of the flow — and then on through Deltaland to the sea. Relations between the two disputants have deteriorated badly, and the Government of Concordia has stepped in, in an attempt to mediate an agreement. Uplandia is not involved in this dispute.

Background

Both Midistan and Deltaland depend heavily on Fluvium water for irrigation. Midistan also uses the river for generating electricity. Deltaland has exploited the waters of the Fluvium since ancient times. Uplandia and Midistan, on the other hand, started to make substantial use of the river's water only about ten years ago. Eighteen months ago, Uplandia began filling its new dam at Updama. A few months later the new Soviet-constructed dam at Mididam in Midistan became operational.

Midistan and Deltaland are ruled by leaders who came to power after military coups. They are loosely aligned to the Soviet Union. Their armed forces are similar in size — both are large and battle-hardened.

Recent developments

On April 7, Deltaland accused Midistan of putting at risk the lives of the three million Deltaland farmers dependent on the water of the Fluvium by diverting excessive volumes from the river. The Deltaland News Agency reported the protest came "as a result of the lack of response by the Midistani Government to all efforts exerted by the Deltaland Government for years to reach an agreement...". Two days later, the Deltaland Government issued a statement saying it would take whatever steps were necessary to ensure access to the waters of the Fluvium and would hold Midistan responsible for any harm to Deltalandish farmers. A congress of Midistani political leaders, on the same day, condemned the Deltaland regime for plotting with enemies of Midistan and betraying the common heritage of the two countries. There were reports that 200 military and civilian leaders had been arrested, in the lead-up to the conference, on charges of plotting against the Midistani Government. Those arrested included the director of a news agency and a former director of Midistani television.

The Midistani Government explained their position on the disagreement over access to Fluvium water in an official statement released on April 19. In the statement, Midistan blamed the current crisis on the Deltaland Government's unwillingness to enter in good faith into tripartite negotiations with Midistan and Uplandia for a permanent agreement over sharing the water. Deltaland instead had conducted secret negotiations with Uplandia. Midistan claimed to have reached provisional agreement with Deltaland two years before for the flow of water during the winter just gone, but had stipulated that the agreed volume would have to be revised when the Updama dam began to fill. Midistan accused Deltaland of avoiding negotiations over this issue when Uplandia had commenced filling the Updama dam in January of last year.

The statement also claimed that, despite substantial reductions in, and interruptions of, the flow of water out of Uplandia, Midistan had allowed 70% of the water received to flow on into Deltaland, had released an additional 200 million m³ (0.7% of the usual annual inflow) during the middle of last year in response to a request by Deltaland and, during last winter had let 75% of water from Uplandia flow on to Deltaland. Further, Midistan accused Deltaland of failing to modernise its irrigation methods in order to make more effective use of the water it does receive.

In response, Deltaland maintained its claims that more water than was required for electricity generation had been withheld and that only half of the water to which Deltaland was entitled had been received.

Claims and counter-claims by Midistan and Deltaland continued through April and May, as did mediation efforts by neighbouring countries including the wealthy regional leader, Concordia. Midistan accused Deltaland of assassinations and mass executions of dissidents on May 7 and, a week later, closed its airspace to Deltalandish aircraft in response to mistreatment of Midistani airline personnel employed in Deltaland. On May 25, Midistan ordered the immediate closure of one of Deltaland's consulates in Midistan. On May 28 a Midistani military official in Deltaland was stabbed and, on May 29, Midistan accused the Deltalandish government of executing 80 government opponents. By June 2, there were reports that both sides had moved troops to the border between the countries and that Deltaland had threatened to bomb the Mididam dam. In response to the deteriorating situation, Concordia renewed its efforts at mediation and a meeting between ministers from the three countries is to be held.

The meeting

Today, Government ministers and officials from the Midistan, Deltaland, and Concordia will meet to try to resolve the dispute. Those present at the meeting will be a senior Minister from the Kingdom of Concordia, and the Foreign Ministers of the Republics of Midistan and Deltaland each accompanied by a military adviser. A statement will be issued at the end of the meeting. The statement may be one of three alternatives. The gist of these statements are as follows:

- (a) Midistan has decided to release additional water in order to meet the needs of the Deltalandish people
- (b) Deltaland has ordered the bombing of the dam at Mididam to release water for the needy Deltalandish people
- (c) Deltaland has declared war on Midistan.

Role of Republic of Midistan Foreign Minister – Mohammad Fareed

A crisis over access to water is brewing between the poor Asian nation, Midistan, and the neighbouring Republic of Deltaland. As Midistan's Foreign Minister, you are attending a meeting with your Deltaland counterpart (Daud Fawaz) and a senior Minister from the Kingdom of Concordia – a wealthy regional power. The Minister from Concordia (Karim Khalid) will attempt to mediate an agreement. The crises has already led to military preparations by both sides. Before joining the meeting you will discuss objectives and strategy with the military adviser who has accompanied you – General Mustafa Ahmad.

As far as you and your government are concerned, Midistan has acted responsibly in a difficult situation that is not of Midistan's making. You are directly responsible to your President who, along with you and the rest of the Midistan government, came to power after a military coup.

Role of Republic of Midistan Military Adviser – General Mustafa Ahmad

A crisis over access to water is brewing between the poor Asian nation, Midistan, and the neighbouring Republic of Deltaland. You are attending a meeting with Deltaland government representatives and a senior Minister from the Kingdom of Concordia – a wealthy regional power. The Minister from Concordia (Karim Khalid) will attempt to mediate an agreement. The crises has already led to military preparations by both sides – troops have been moved to the vicinity of the common border. Your role is to support and advise your Foreign Minister (Mohammad Fareed) with whom you will discuss objectives and strategy before you both join the meeting.

As far as you and your government are concerned, Midistan has acted responsibly in a difficult situation that is not of Midistan's making. You are directly responsible to your Foreign Minister who, along with you and the rest of the Midistan government, came to power after a military coup.

Role of Republic of Deltaland Foreign Minister – Daud Fawaz

A crisis over access to water is brewing between the poor Asian nation, Deltaland, and the neighbouring Republic of Midistan. Deltaland has a long history of using the waters of the River Fluvium and is heavily dependent on the river for agriculture and drinking water. Midistan has recently built a large dam and the Fluvium's flow into Deltaland has been curtailed. As Deltaland's Foreign Minister, you are attending a meeting with your Midistan counterpart (Mohammad Fareed) and a senior Minister from the Kingdom of Concordia – a wealthy regional power. The Minister from Concordia (Karim Khalid) will attempt to mediate an agreement. The crises has already led to military preparations by both sides. Before joining the meeting you will discuss objectives and strategy with the military adviser (General Dirwar Ali) who has accompanied you.

You are directly responsible to your President who, along with you and the rest of the Deltaland government, came to power after a military coup.

Role of Republic of Deltaland Military Adviser – General Dirwar Ali

A crisis over access to water is brewing between the poor Asian nation, Deltaland, and the neighbouring Republic of Midistan. Deltaland has a long history of using the waters of the River Fluvium and is heavily dependent on the river for agriculture and drinking water. Midistan has recently built a large dam and the Fluvium's flow into Deltaland has been curtailed. You are attending a meeting with Midistan government representatives and a senior Minister from the Kingdom of Concordia – a wealthy regional power. The Minister from Concordia (Karim Khalid) will attempt to mediate an agreement. The crises has already led to military preparations by both sides – troops have been moved to the vicinity of the common border. Your role is to support and advise your Foreign Minister (Daud Fawaz) with whom you will discuss objectives and strategy before you both join the meeting.

You are directly responsible to your Foreign Minister who, along with you and the rest of the Deltaland government, came to power after a military coup.

Role of Kingdom of Concordia Senior Minister – Karim Khalid

Two poor neighbours of the wealthy Kingdom of Concordia appear to be edging closer to war in a dispute over access to the waters of a river that flows from one (Midistan) to the other (Deltaland). Your Kingdom has a traditionally played a paternal role in the region, and has an interest in preserving peace. To that end, you have called a meeting, which is being attended by Midistan and Deltaland representatives, with the hope that your mediation will lead to a peaceful solution to the crisis. Midistan is represented by Foreign Minister Mohammad Fareed and Military Adviser General Mustafa Ahmad. Deltaland is represented by Foreign Minister Daud Fawaz and Military Adviser General Dirwar Ali.

ZENITH INDUSTRIAL CORPORATION INVESTMENT DECISION

Zenith is a large manufacturing business based in a populous developed country. Zenith manufactures "product".

The year is 1975, and Zenith has recently been nationalised by a new left-leaning government. Under its previous owners, Zenith had begun to lag behind international competitors as a consequence of disruptions caused by a supplier's ongoing industrial conflicts and the Zenith owners' reluctance to invest in the business. The new government regard Zenith as important because of its size and the widespread use of product by other manufacturers. Unfortunately for the Government, Zenith must reduce costs in order to regain international competitiveness -- the corporation is currently suffering losses of \$US 10 million per week. A \$US 10 billion dollar redevelopment project is underway that will see older plants retired and new plants commissioned. Efficiency gains as a result of the project will result in a net loss of 50,000 jobs, and will have a major impact on a region (Naggaland) that traditionally provides much support for the party that is now in government. Unsurprisingly, the government have made political commitments to Naggaland.

Last year (1974) international demand for product was high and Zenith was not able to keep pace with demand. In that year, the chair of Zenith (Sir Archie Stevenson) had discussions with the owner of Acma, a foreign manufacturer of new technology product-making plant. As an outcome of those discussions, the Zenith board gave approval, in principle, for the purchase of one plant from Acma. The price quoted by Acma was \$US 26 million. They have subsequently quoted \$US 43 million for two plants. The Acma offers remain current until February 15, 1975.

The Acma plant, or plants, would offer some advantages to Zenith. Firstly, the Acma plant uses a different combination of inputs and would therefore somewhat reduce Zenith's vulnerability to industrial action by a traditional supplier's union. Secondly, the plant would give Zenith experience with a new technology and, thirdly, the plant could be located in Naggaland. Sir Archie was appointed by the Government with the understanding that he would be sympathetic to the Government's political commitment to Naggaland. Sir Archie has made it known that he prefers the two-plant option.

Since the board's original agreement in principle with Acma, the world economy has slid into recession and the demand for product has fallen. Sir Archie has made it known that he wants a \$US 50 million reduction in capital spending. With the February 15 deadline looming, and negotiations with Acma underway, Zenith's Policy Committee asks the company's planners to assess the merits of the Acma proposals.

On 5 February the planners came back with a surprising assessment. The production costs of product from the Acma plants would be higher than the production costs from conventional technology plants. The existing technology produces product for \$US 112 per unit, whereas a single Acma plant would produce product for \$US 126 per unit and two Acma plants would produce product for \$US 116 per unit. Not only that, the planners' demand projections indicated that currently planned production capacity would be sufficient to meet demand in all but the first 2 years of the 6 year forecast period. The planners pointed out that this projected slight shortfall in production could be met by delaying the retirement of a number of older plants while their capacity was still required. Sacrificing the Acma plant would also appear to be a sensible way of meeting the Chairman's expressed desire to cut capital expenditure by \$US 50 million. Sir Archie has asked Herbert Lumley (Director of Planning and Capital Development) to present the planners' findings to the Policy Committee on Tuesday 11 February.

The 11 February meeting is to be chaired by Sir Archie. Herbert Lumley will present the planners' findings that are outlined above. The purpose of the meeting is to decide whether to commission one Acma plant, two Acma plants, or not to commission any Acma plants. The Committee must reach a decision on this question at the meeting. The Committee's recommendation (one, two, or zero Acma plants) will almost certainly be accepted by the Board? most Board members are also on the Committee.

Zenith Policy Committee

Sir Archie Stevenson

(Chairman of Zenith Board and Chairman of Policy Committee)

You were appointed by the Government with the expectation that you would oversee the transformation of Zenith in such a way as to minimise any damage to the Government's reputation, particularly among its natural constituencies. The Government know that their Naggaland constituents will be badly affected by plant closures and staff layoffs by Zenith. You hail from Naggaland yourself, and retain interests there.

You are not averse to using your authority to take control of a meeting. At the same time, as chairman, you must be prepared to let all parties have their say, and prefer to reach a consensus decision. Your responsibilities as the Chairman of the Board of this very large industrial company, are considerable. It is you that must be able to see the ? bigger picture? . You must balance the demands of the various parties that have an interest in a decision that is to be made, and at the same time retain the support of your fellow Committee members and the Board.

You are kept well-informed about developments in the company as they occur -- this gives you something of an advantage over others in the company, as their information is often incomplete.

Mark Stepman QC (Zenith Deputy Chairman)

As a senior officer of Zenith, you make many decisions based on material that is presented to you by other officers of the company. You must use your judgment in weighting the evidence that is provided and in incorporating your view of the wider aims of the company.

Robert Revell (Zenith Company Secretary)

As a senior officer of Zenith, you make many decisions based on material that is presented to you by other officers of the company. You must use your judgment in weighting the evidence that is provided and in incorporating your view of the wider aims of the company.

James Drywall (Zenith Managing Director for Corporate Strategy)

As a senior officer of Zenith, you make many decisions based on material that is presented to you by other officers of the company. You must use your judgment in weighting the evidence that is provided and in incorporating your view of the wider aims of the company.

Lord Gratton

(Zenith Executive Director)

As a senior officer of Zenith, you make many decisions based on material that is presented to you by other officers of the company. You must use your judgment in weighting the evidence that is provided and in incorporating your view of the wider aims of the company.

Lionel Hunt

(Zenith Finance Director & member of Zenith Board)

As Zenith Industrial Corporation's Finance Director it is your responsibility to insure that the company is run a way that is financially sound. You must ensure that new capital investment can be expected to deliver a satisfactory return, either singly or as part of a diversified portfolio. You expect to be presented with a well-argued case for any new expenditure, and are not readily impressed by unsupported rhetoric.

Herbert Lumley

(Zenith Planning & Capital Development Director)

As the Director of Planning and Capital Development for Zenith Industrial Corporation, both the Chief Planner, John Grove-White, and the Manager of Capital Projects, Ron Able, report to you. Ron also has the role of chief negotiator for the purchase of some major new plant for Zenith. Ron has been lobbying you hard to gain your support for the purchase, and emphasises that the company's Chairman, Sir Archie Stevenson, is keen for the purchase to go ahead.

The Policy Committee must meet to decide whether or not the plant purchase should go ahead, and have asked you to get your planning team, headed by John Grove-White, to assess the merits of the proposal. You expect John and his team to conduct a rigorous and impartial assessment. You are expected to present their findings to the Committee. Both John, and Ron Able will be with you at the meeting.

John Grove-White

(Chief Planner)

Your manager, Herbert Lumley, asked you and your team to assess the merits of a plan to purchase some major new plant. You are aware that there has already been a commitment of sorts to the new plant but, as a matter of personal and professional pride, you and your team will endeavour to conduct a rigorous assessment of the plan. Consequently, you expect your findings to be taken seriously. Although you might consider yourself a cut above your colleagues, both intellectually and socially, you are decidedly a junior participant in the situation that is unfolding. You are an ambitious young man and, as such, are conscious that your decisions can influence your prospects.

Ron Able

(Capital Projects Manager & Chief Negotiator)

You are the chief negotiator for the purchase of some major new plant for your company. This puts you in a powerful position, as you control the information about the progress of the negotiation that is passed-on to your colleagues. As you are also Capital Projects Manager, you have a vested interest in the purchase going ahead -- the more capital investment, the greater your responsibilities. You believe that the Chairman is strongly supportive of the purchase.

You are a WWII veteran, and a practical no-nonsense sort of man.

Reviewer Appendix 2

Artists protest

What will be the final resolution of the artists' sit-in? (check one ✓, or %)

- (A) The government will relax entrance rules and allow an artist to remain in the programme for an indefinite period. []
- (B) The government will extend an artist's time in the programme to 2 or 3 years []
- (C) The government will extend the programme 2 or 3 years and relax entrance rules []
- (D) The government will relax the entrance requirements only []
- (E) The government will make no change in the programme. []
- (F) The government will end the programme completely. []

Distribution channel

Will the management of a supermarket chain accept the CRTP in their stores? (check one ✓, or %)

- (A) Yes, as a long term arrangement (with one month pilot) []
- (B) Yes, as a short term promotion []
- (C) Yes, either (A) or (B) []
- (D) No, they will reject the plan []

55% pay plan

Will there be a strike? (check one ✓, or %)

- (A) Yes, a long strike (½ or more of the regular season games will be missed) []
- (B) Yes, a medium length strike (less than ½ of the regular season games will be affected) []
- (C) Yes, a short strike (only preseason games missed) []
- (D) No strike will occur []

Nurses dispute

The outcome of the negotiation was that... (check one ✓, or %)

- a. Nurses' demand for an immediate 7% pay rise and a 1-year term was substantially or entirely met []
- b. CWH's offer of a 5% pay rise and a 2-year term was substantially or entirely accepted []
- c. A compromise was reached []

Personal grievance

The outcome of the 24 April meeting was? (check one ✓, or %)

- a. Management agree to a new evaluation being conducted before holding further discussions on salary bands []
- b. Staff accept the salary bands proposed by management on 14 February with few or any modifications []
- c. Parties agree to ask a third party (e.g. mediator, independent job-evaluator) to decide on salary bands []
- d. Parties fail to reach any agreement []

Telco takeover

How was the stand-off between Localville and Expander resolved? (check one ✓, or %)

- a. Expander's takeover bid failed completely []
- b. Expander purchased Localville's mobile operation only []
- c. Expander's takeover succeeded at, or close to, their August 14 offer price of \$43-per-share []
- d. Expander's takeover succeeded at a substantial premium over the August 14 offer price []

Water dispute

The gist of the statement issued at the end of the meeting was? (check one ✓, or %)

- a. Midistan has decided to release additional water in order to meet the needs of the Deltalandish people []
- b. Deltaland has ordered the bombing of the dam at Mididam to release water for the needy Deltalandish people []
- c. Deltaland has declared war on Midistan []

Zenith investment

Which option will the Zenith Policy Committee choose? (check one ✓, or %)

- (A) One ACMA plant []
- (B) Two ACMA plants []
- (C) No ACMA plants []

Reviewer Appendix 3

Outline of frequencies versus most-likely experiment Method and results from Green and Armstrong (2004)¹

We asked 52 university students to make predictions about conflict situations. We gave each student four conflicts from a set of eight. We asked half our participants to assume there were 100 situations similar to a target conflict. We then asked them "...in how many of these situations would..." each one of a list of possible outcomes occur? The full question for one of the conflicts, Telco Takeover, is shown in Exhibit 1. We told the other participants to choose the most likely outcome from a list (Exhibit 2).

Exhibit 1

Assume there are 100 situations similar to the one described, in how many of these situations would...

- a. The takeover bid fail completely? out of 100
- b. The mobile operation alone be purchased? out of 100
- c. The takeover succeed at, or close to, the offer price? out of 100
- d. The takeover succeed at a substantial premium over the offer price? out of 100

Exhibit 2

How was the stand-off between Localville and Expander resolved? (check one ✓ or %)

- a. Expander's takeover bid failed completely
- b. Expander purchased Localville's mobile operation only
- c. Expander's takeover succeeded at, or close to, their August 14 offer price of \$43-per-share
- d. Expander's takeover succeeded at a substantial premium over the August 14 offer price

We looked at the accuracy of the option chosen, or allocated the highest frequency or percentage, by the participants. On that basis, as the following table shows, there was no difference in the average accuracy of forecasts from the two approaches.

Accuracy of novices forecasts
Percent correct forecasts (number of forecasts)

	Chance	Frequencies	Most-likely	Total
55% Pay Plan	25	0 (12)	9 (11)	4 (23)
Artists Protest	17	10 (10)	0 (11)	5 (21)
Distribution Channel	33	23 (13)	38 (13)	31 (26)
Personal Grievance	25	11 (9)	46 (13)	32 (22)
Telco Takeover	25	50 (12)	25 (12)	38 (24)
Zenith Investment	33	40 (10)	42 (12)	41 (22)
Water Dispute	33	67 (12)	42 (12)	54 (24)
Nurses Dispute	<u>33</u>	<u>64</u> (<u>11</u>)	<u>58</u> (<u>12</u>)	<u>61</u> (<u>23</u>)
Averages (unweighted)	28	33 (89)	33 (96)	33 (185)

¹ Green, K. C., J. S. Armstrong. 2004. On the value of expertise for forecasting decisions in conflicts. Working paper: Monash University