



Colonial Broadcasting Company

Part A

Barbara Warrington, Vice-President of Programming at Colonial Broadcasting Company (CBC), sat in her office preparing for a meeting with Bruce Gold, an independent movie producer. Warrington thought that Gold would probably try to sell to CBC a movie idea based on the true story of a young boy who overcomes a debilitating illness. In recent years, the number of TV movies based on real-life events (fact-based movies) had been steadily growing. The networks seemed to believe that these movies brought higher ratings than fictional movies. But Warrington wasn't so sure. She suspected that other factors could be responsible for the high ratings of fact-based movies. Warrington had data on TV movies that were broadcast during 1992. She decided to have one of her assistants run some regressions to find out what was really driving ratings.

Colonial Broadcasting Company

Along with American Broadcasting Network (ABN) and Bellmore Broadcasting Service (BBS), Colonial Broadcasting Company is one of three major American television networks.¹ Every week, each network broadcasts hundreds of hours of national programming, including news, sports, talk shows, as well as prime-time programming (theatrical and made-for-television movies;² action, comedy, and drama series; news specials, etc.).³

Broadcasting TV Movies

TV movies were first broadcast in the mid-1960s, and in the following decades came to play a major part in network programming. By 1992, the three major networks—ABN, BBS, and CBC—

1. A fourth network, Derby Television Network (DTN), has some highly-rated national shows and is an important competitor to the three majors. However, since DTN does not have daily national prime time programming, it is not considered in this case.

2. Theatrical movies are originally released in theatres and are shown on television several years after theatrical release. In contrast, made-for-television or TV movies are made explicitly for television.

3. Prime time runs from 8–11 p.m. on the East and West Coasts and from 7–10 p.m. in the Central States. The TV season runs from September to May. Thus, the three networks jointly broadcast approximately 2,300 hours of prime-time programming annually.

Professor George Wu prepared this case as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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were underwriting the production costs for more than two hundred hours of TV movies annually, approximately 10% of network prime time programming.

The typical TV movie is made by an independent producer, with the cost underwritten by one of the networks. It is approximately 92 minutes long, but with commercials, it runs for two hours. TV movies are broadcast during prime time, usually beginning at 9 p.m. on the East and West Coasts and at 8 p.m. in the Central States.

The networks' aim in broadcasting TV movies is to attract a large and demographically desirable audience. Networks are funded by advertisers who pay for on-air advertising time, and advertisers pay higher prices for programs which attract larger audiences. A network's success in attracting a large audience is reflected in its Nielsen ratings.⁴ These ratings, expressed as a percentage of all American households with televisions, measure how many televisions are turned on to particular programs. In 1992, each rating point represented 921,000 American households. Therefore, if a movie received a 25 rating during a given half-hour time slot, about 23 million households were tuned in to that movie at that time.

The TV movie with the highest rating on record is *The Day After* (a movie about the aftermath of a nuclear holocaust) which garnered a rating of 46 when broadcast in 1983. The broadcast of the 1992 Super Bowl, by comparison, received a Nielsen rating of 40.

Making a TV Movie

The networks do not produce their own TV movies but instead contract with independent producers to have them made. Producers must first sell a movie concept to a network. The concepts the producer has to choose from fall into two basic categories: those drawn from fact and those drawn from fiction. A typical fact-based concept for a TV movie might be drawn from national or regional newspapers or a nonfiction book. On the other hand, a fictional movie might be based on a novel, play, screenplay, or simply the producer's brainstorming.

If necessary, the producer must arrange for an option on the story rights. If the movie concept is based on a true-life occurrence, the option takes the form of an agreement between the producer and the rights holder, usually the people involved in the real-life events. In contrast, for novels, plays, and screenplays, the producer merely needs to get an option on the appropriate copyright. In most cases, a fee is paid for an exclusive option. The option then gives the producer the right to buy a piece of material within a specified period of time (e.g., the producer might pay \$10,000 for a one-year option to buy the rights to a story for an additional \$100,000). Once the producer has the story-rights, he can approach the networks and pitch his concept for the movie.

The networks have several basic criteria for judging potential TV movies. Unlike television series, for which audience loyalty can be built over the course of a season or even many seasons, TV movies are usually a one-shot deal. Ideally, network executives believe, TV movies should be

"'believable' and sensational at the same time ... Characters should be simple and simply motivated, heroes familiar, stories full of conflict, endings resolved, uplift apparent, and each act should end on a note of suspense sufficient to carry the viewer through the commercial break."⁵

4. A. C. Nielsen Company is a major research firm which provides data on ratings and market-share for prime-time programming based on information gathered from sample households throughout the continental United States.

5. Todd Gitlin, *Inside Prime Time* (New York: Pantheon Books, 1983): 161, 165.

If a movie concept generates enough interest from the network, the network will pay a script-writer to develop the idea into a full-length script.

If the script is acceptable, then the network will commit to produce the movie. Typically, the network and production company agree on a licensing fee (usually \$2.60 to \$2.75 million which covers the bulk of the production costs) for the network's exclusive North American right to broadcast the movie twice in four years. The licensing fee covers the bulk of the producer's production costs.⁶

Warrington's Decision

Warrington knew that CBC's programming decisions were motivated primarily by ratings. She made a mental list of factors that might affect a TV movies' ratings: the day of the week or month it was broadcast, the broadcasting network, whether the movie had a big-name star, whether it was scheduled against tough competition, or whether the program immediately before it on the same network had high or low ratings. Was the movie concept—fact-based or fictional—one of the factors that drove ratings? Warrington looked down at the regressions which her assistant had brought in (see **Exhibits 1 and 2**). What did they tell her?

⁶ The licensing fee paid by the network usually falls about \$400,000 short of actual production costs. After the network broadcasts the movie, the rights revert to the production company. The production company covers the short-fall with national and international fees for theater and television syndication and video cassette release.

Exhibit 1 Data on 1992 TV Movies*

Variable	Description
NETWORK	Broadcasting network (ABN, BBS, or CBC)
MONTH	1 = January, 2 = February, ..., 12 = December
DAY	1 = Monday, 2 = Tuesday, ..., 7 = Sunday
RATING	Nielsen rating for movie
FACT	1 = based on true events, 0 = fictional
STARS	Number of actors or actresses paid over \$300,000
PREVIOUS RATING	Nielsen rating for program immediately preceding movie on same network
COMPETITION	Average of Nielsen ratings received by the two competing networks during the movie's broadcast

In addition, several dummy variables derived from the variables listed here are used in the regressions which follow. Examples are

ABN	1 if NETWORK = ABN,
BBS	1 if NETWORK = BBS,
OCT	1 if MONTH = 10,
DEC	1 if MONTH = 12,
APR-MAY	1 if MONTH = 4 or MONTH = 5,
MON	1 if DAY = 1,
SUN	1 if DAY = 7.

* All 1992 TV movies, not including sequels to old television series, movies that are part of a series, two-hour pilots for television series, or two-hour segments of a television mini-series.

Exhibit 1 Data on 1992 TV Movies (continued)

Observation	Network	Month	Day	Rating	Fact	Stars	Previous Ratings	Competition
1	BBS	1	1	15.6	0	1	14.2	14.5
2	BBS	1	7	10.8	1	0	15.3	17.2
3	BBS	1	7	14.1	0	1	13.8	14.4
4	BBS	1	1	16.8	1	1	12.8	15.3
5	BBS	2	1	14.3	1	1	12.4	13.3
6	BBS	2	1	17.1	1	1	12.9	15.1
7	BBS	3	1	8.9	0	0	10.8	14.9
8	BBS	3	7	16.2	1	0	13.3	11.6
9	BBS	4	7	9.4	0	1	12.3	12.8
10	BBS	5	1	10.2	0	1	10.7	15.6
11	BBS	5	7	9.4	0	0	10.7	14.5
12	BBS	5	1	12.1	0	1	10.1	15.6
13	BBS	5	1	10.7	1	0	8.6	17.0
14	BBS	9	7	15.0	1	0	9.8	8.2
15	BBS	9	7	10.2	0	0	11.7	13.5
16	BBS	9	7	10.3	0	1	10.1	15.2
17	BBS	10	7	10.8	0	1	10.9	13.1
18	BBS	10	7	14.4	1	0	15.9	12.6
19	BBS	11	7	14.4	1	1	12.1	14.2
20	BBS	11	7	13.6	1	0	11.4	11.9
21	ABN	1	7	14.6	0	0	19.3	14.4
22	ABN	1	2	10.8	0	1	16.3	15.2
23	ABN	1	7	16.2	0	0	20.1	14.4
24	ABN	1	2	12.8	0	0	14.8	13.1
25	ABN	1	7	16.0	0	1	19.3	13.5
26	ABN	2	7	18.9	0	1	17.8	13.0
27	ABN	2	2	14.0	1	1	14.3	13.8
28	ABN	3	7	19.5	1	1	16.2	11.8
29	ABN	3	2	14.7	1	0	13.8	15.7
30	ABN	3	7	16.3	0	1	18.0	11.4
31	ABN	3	7	15.8	1	0	17.7	13.3
32	ABN	3	7	17.1	0	1	17.1	11.3
33	ABN	3	2	11.5	0	0	13.8	13.1
34	ABN	3	7	16.0	1	0	15.3	11.8
35	ABN	3	2	11.7	0	1	16.6	14.3
36	ABN	4	2	14.2	0	0	13.6	11.4
37	ABN	4	7	11.2	0	0	14.3	14.4
38	ABN	4	2	10.9	0	0	12.4	13.0
39	ABN	4	7	13.3	0	1	13.1	10.1
40	ABN	4	7	15.5	1	0	17.0	12.4
41	ABN	4	2	16.6	1	0	13.6	11.8
42	ABN	5	7	16.3	1	0	16.5	12.8
43	ABN	5	7	15.8	0	1	15.7	11.3
44	ABN	5	2	13.3	1	0	10.7	12.8

Exhibit 1 Data on 1992 TV Movies (continued)

Observation	Network	Month	Day	Rating	Fact	Stars	Previous Ratings	Competition
45	ABN	9	7	15.4	0	1	17.3	10.9
46	ABN	9	2	14.7	0	0	15.5	13.9
47	ABN	9	7	15.5	0	0	17.4	12.6
48	ABN	9	2	14.7	1	0	15.3	14.0
49	ABN	10	7	15.9	1	0	18.4	10.5
50	ABN	10	7	13.8	1	0	24.7	12.1
51	ABN	10	2	10.0	0	1	14.2	12.9
52	ABN	11	7	12.9	0	1	16.9	18.6
53	ABN	11	2	15.4	1	0	15.9	12.4
54	ABN	11	7	14.5	0	2	19.4	14.2
55	ABN	12	7	18.8	0	2	16.7	14.7
56	ABN	12	2	16.7	0	0	14.9	10.1
57	ABN	12	2	12.8	0	0	16.3	12.0
58	ABN	12	7	16.8	0	1	15.7	10.1
59	CBC	1	7	14.0	0	1	8.2	14.8
60	CBC	1	1	11.3	1	0	13.0	13.2
61	CBC	1	1	13.6	0	0	13.7	15.1
62	CBC	2	7	12.9	1	0	8.8	16.0
63	CBC	2	1	13.2	1	0	13.1	17.0
64	CBC	2	7	16.0	1	0	6.9	15.8
65	CBC	2	1	14.6	1	1	13.8	17.4
66	CBC	2	7	16.6	0	1	16.8	14.4
67	CBC	3	1	17.5	1	0	14.8	14.2
68	CBC	3	7	11.6	0	0	10.0	14.0
69	CBC	4	7	8.9	0	0	8.6	13.0
70	CBC	4	1	15.6	0	0	13.3	16.8
71	CBC	4	7	9.2	0	1	6.8	12.1
72	CBC	4	1	11.8	0	0	12.9	12.0
73	CBC	4	7	11.0	0	0	5.3	14.7
74	CBC	4	1	9.5	1	0	13.0	17.3
75	CBC	9	7	11.6	0	0	10.1	12.8
76	CBC	9	1	13.3	1	0	13.1	20.3
77	CBC	9	1	13.6	1	0	14.1	18.3
78	CBC	10	1	12.4	0	0	13.6	20.2
79	CBC	10	1	13.8	1	0	10.2	16.6
80	CBC	10	7	11.9	1	0	11.8	12.2
81	CBC	10	1	14.6	0	0	14.9	14.9
82	CBC	11	1	15.8	1	1	13.4	17.2
83	CBC	11	1	15.4	0	1	13.6	16.8
84	CBC	11	1	12.8	0	0	12.7	14.6
85	CBC	12	7	12.8	0	0	12.0	18.6
86	CBC	12	1	15.1	0	0	14.1	15.5
87	CBC	12	1	11.4	0	1	11.2	16.4
88	CBC	12	1	19.1	1	0	12.6	15.4

Exhibit 2 Regressions on 1992 TV Movies

<p>Regression Number 1 Dependent Variable: RATING</p> <table border="0"> <tr> <td></td> <td><u>Constant</u></td> <td></td> <td><u>BBS</u></td> <td><u>ABN</u></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Regr. Coef.</td> <td>13.36</td> <td></td> <td>(0.6483)</td> <td>1.397</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Std. Error</td> <td>0.44</td> <td></td> <td>0.6990</td> <td>0.591</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>t value</td> <td>30.2</td> <td></td> <td>(0.9)</td> <td>2.4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p># of obs = 88 Deg of F = 85 R-squared = 0.1143 Resid SD = 2.421</p>													<u>Constant</u>		<u>BBS</u>	<u>ABN</u>								Regr. Coef.	13.36		(0.6483)	1.397								Std. Error	0.44		0.6990	0.591								t value	30.2		(0.9)	2.4											
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<p>Regression Number 5 Dependent Variable: RATING</p> <table border="0"> <tr> <td></td> <td><u>Constant</u></td> <td><u>Fact</u></td> <td><u>Stars</u></td> <td><u>Previous Ratings</u></td> <td><u>Competition</u></td> <td><u>BBS</u></td> <td><u>ABN</u></td> <td><u>Oct</u></td> <td><u>Dec</u></td> <td><u>Apr-May</u></td> <td><u>Mon</u></td> <td><u>Sun</u></td> </tr> <tr> <td>Regr. Coef.</td> <td>12.82</td> <td>1.899</td> <td>0.7406</td> <td>0.1862</td> <td>(0.2899)</td> <td>(1.046)</td> <td>1.078</td> <td>(1.540)</td> <td>1.398</td> <td>(1.403)</td> <td>2.523</td> <td>1.525</td> </tr> <tr> <td>Std. Error</td> <td>2.01</td> <td>0.441</td> <td>0.4216</td> <td>0.1089</td> <td>0.1106</td> <td>0.601</td> <td>1.036</td> <td>0.687</td> <td>0.729</td> <td>0.566</td> <td>1.002</td> <td>0.707</td> </tr> <tr> <td>t value</td> <td>6.4</td> <td>4.3</td> <td>1.8</td> <td>1.7</td> <td>(2.6)</td> <td>(1.7)</td> <td>1.0</td> <td>(2.2)</td> <td>1.9</td> <td>(2.5)</td> <td>2.5</td> <td>2.2</td> </tr> </table> <p># of obs = 88 Deg of F = 76 R-squared = 0.5445 Resid SD = 1.836</p>													<u>Constant</u>	<u>Fact</u>	<u>Stars</u>	<u>Previous Ratings</u>	<u>Competition</u>	<u>BBS</u>	<u>ABN</u>	<u>Oct</u>	<u>Dec</u>	<u>Apr-May</u>	<u>Mon</u>	<u>Sun</u>	Regr. Coef.	12.82	1.899	0.7406	0.1862	(0.2899)	(1.046)	1.078	(1.540)	1.398	(1.403)	2.523	1.525	Std. Error	2.01	0.441	0.4216	0.1089	0.1106	0.601	1.036	0.687	0.729	0.566	1.002	0.707	t value	6.4	4.3	1.8	1.7	(2.6)	(1.7)	1.0	(2.2)	1.9	(2.5)	2.5	2.2
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<p>Regression Number 6 Dependent Variable: RATING</p> <table border="0"> <tr> <td></td> <td><u>Constant</u></td> <td><u>Fact</u></td> <td><u>Stars</u></td> <td><u>Previous Ratings</u></td> <td></td> <td><u>BBS</u></td> <td><u>ABN</u></td> <td><u>Oct</u></td> <td><u>Dec</u></td> <td><u>Apr-May</u></td> <td><u>Mon</u></td> <td><u>Sun</u></td> </tr> <tr> <td>Regr. Coef.</td> <td>8.589</td> <td>1.911</td> <td>0.6559</td> <td>0.1658</td> <td></td> <td>(0.6608)</td> <td>1.754</td> <td>(1.354)</td> <td>1.566</td> <td>(1.257)</td> <td>2.226</td> <td>1.736</td> </tr> <tr> <td>Std. Error</td> <td>1.251</td> <td>0.457</td> <td>0.4361</td> <td>0.1127</td> <td></td> <td>0.6041</td> <td>1.041</td> <td>0.709</td> <td>0.753</td> <td>0.585</td> <td>1.033</td> <td>0.729</td> </tr> <tr> <td>t value</td> <td>6.9</td> <td>4.2</td> <td>1.5</td> <td>1.5</td> <td></td> <td>(1.1)</td> <td>1.7</td> <td>(1.9)</td> <td>2.1</td> <td>(2.1)</td> <td>2.2</td> <td>2.4</td> </tr> </table> <p># of obs = 88 Deg of F = 77 R-squared = 0.5033 Resid SD = 1.005</p>													<u>Constant</u>	<u>Fact</u>	<u>Stars</u>	<u>Previous Ratings</u>		<u>BBS</u>	<u>ABN</u>	<u>Oct</u>	<u>Dec</u>	<u>Apr-May</u>	<u>Mon</u>	<u>Sun</u>	Regr. Coef.	8.589	1.911	0.6559	0.1658		(0.6608)	1.754	(1.354)	1.566	(1.257)	2.226	1.736	Std. Error	1.251	0.457	0.4361	0.1127		0.6041	1.041	0.709	0.753	0.585	1.033	0.729	t value	6.9	4.2	1.5	1.5		(1.1)	1.7	(1.9)	2.1	(2.1)	2.2	2.4
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Questions

For Questions 1a and 1b only, consider Regression 1.

- 1a. Rank the networks in terms of average ratings for TV movies during 1992.
- 1b. On average, how much higher are the ratings for the leading network than the ratings for the second-highest network?
- 2a. In 1992, what were the average ratings for fact-based movies?
- 2b. In 1992, what were the average ratings for fictional movies?
3. Consider Regression 2. Is the difference between the ratings for fact-based and fictional movies statistically significant? Explain.
4. Compare Regression 2 and Regression 3. Do the regressions suggest that, on average,
 - a. a fact-based movie has fewer stars than a fictional movie;
 - b. a fact-based movie has more stars than a fictional movie;
 - c. a fact-based movie has just as many stars as a fictional movie;
 - d. cannot be determined.

Choose one and explain.

For the next two questions, consider Regression 5.

5. On Sunday nights, CBC usually presents "Josette and Yvette" at 8:00 p.m., followed by the Sunday night movie at 9:00 p.m. Typical ratings for "Josette and Yvette" are 17.5. This week, Warrington is considering replacing "Josette and Yvette" with a live rock concert that is expected to garner a rating of 20 points. What is the expected change in ratings for the Sunday night movie?
- 6a. Warrington fears that a movie with high expected ratings might provoke the other networks to schedule better programming against CBC. Suppose that in response to CBC's programming, both ABN and BBS schedule different programs, each of which is expected to rate 2 rating points higher. What is the expected impact on the ratings of CBC's TV movie?
- 6b. Oskar Morgenstern, a CBC network executive, believes that network programming does not affect the size of the total television audience in a given time slot. Instead, he believes that a network's programming only determines the network's percentage share of the total audience. Does Regression 5 support Morgenstern's position? Explain.
7. Warrington believes that movies with stars tend to be shown in favorable time slots (e.g., good months, good days of the week, and following highly rated programs).
 - a. Are the regressions consistent with her beliefs? Explain.
 - b. Warrington is planning to add a fictional movie to the programming schedule. She must decide whether or not to use a star. What is the difference in expected ratings between using a star and not using a star?
8. The conventional industry wisdom is that fact-based movies have higher ratings than movies based on fictional stories. Do the regressions support or contradict this view?

Colonial Broadcasting Company

Part B

Warrington could barely believe her ears: just minutes before, she had gotten a call from Harsanyi Electric, a leading international consumer electronics company. Harsanyi was willing to sponsor a CBC TV movie, paying CBC a fee of \$7,500,000 for the 28 minutes of advertising. The only catch was that Harsanyi Electric wanted CBC to guarantee ratings of 19 points. For every point that CBC fell short of this target, Harsanyi would get a rebate of \$1,000,000. If the rating exceeded 19, however, no additional fee would be paid. Fractional ratings would be pro-rated: for example, if the rating was 18.4, then Harsanyi would get a rebate of \$600,000. Warrington was unsure of whether the risk was worth it: \$7,500,000 was a lot of money, but 19 points was an aggressive target. If Warrington rejected Harsanyi's offer, then she could always get a fee of \$5,000,000 with no risk.

For the questions below, assume it is impossible to predict the ratings for the competitor's programs.

9. Warrington wants to put the TV movie in the best possible slot so as to help ensure high ratings. She has 3 slots available:

APRIL, SUNDAY (following a show that typically receives a rating of 8.5)
 MARCH, MONDAY (following a show that typically receives a rating of 13.0)
 DECEMBER, SUNDAY (following a show that typically receives a rating of 8.5)

If Warrington wants to maximize the chance of high ratings, when should she schedule the TV movie?

10. Warrington is unsure of which TV movie to schedule. Due to the limited budget for a TV movie, CBC can choose either a fictional movie with a star or a fact-based movie without a star. Both movies are identical in all other respects. Assuming she wishes to maximize ratings, which movie should Warrington choose?

For the next two questions, assume that a normal distribution with mean m and standard deviation s , can be approximated with the following discrete 5-point distribution:

Probability	Value
.20	$m - 1.3s$
.20	$m - 0.5s$
.20	m
.20	$m + 0.5s$
.20	$m + 1.3s$

Thus, each point gets the same probability, .20.

11. Suppose that Warrington has scheduled a fact-based movie without a star for a Monday time slot in March (again, following a show that typically receives ratings of 13.0). Should Warrington accept Harsanyi Electric's offer or accept the fixed fee of \$5,000,000?
12. Suppose that, prior to accepting or rejecting Harsanyi Electric's offer, Warrington could purchase a regression that would tell with virtual certainty what the Nielsen rating of the proposed movie would be. What is the most that Warrington would be willing to pay for such a regression?