REFERENCES

Bailey, W., Couët, B., Lamb, F., Simpson, G., and Rose, P. (2000). Taking a calculate risk. Oilfield Review Autumn: 20-35.

Brown, A. M. (2001). A step-by-step guide to non-linear regression analysis of experimental data usin a Microsoft Excel spreadsheet. Computer Methods and Programs in Biomedicine 65: 191-200.

Clemen, R. T. (1991). Making hard decision : An introduction to decision analysis. Boston: PWS – KENT.

Cozzolino, J. M. (1978). A new method for measurement and control of exploration risk, SPE 6632 revised version for consideration for publication in the Journal of Petroleum Technology.

Cozzolino, J. M. (1977). A simplified utility framework for the analysis of financial risk, SPE 6359 presented at the 1997 Economics and Evaluation Symposium of the Society of Petroleum Engineers of AIME held in Dallas, TX, USA.

Goodwin, P., and Wright, G. (1991). Decision analysis for management judgment. 3 rd ed. Chichester: John Wiley & Sons.

Hammond, J. S. (1967). Better decisions with preference theory. Harvard Business Review: 123-141.

Hodder, J. E., and Riggs, H. E. (1985). Pitfalls in evaluating risky projects. Harvard Business Review: 128-135.

Howard, R. A. (1988). Decision analysis: Practice and promise. Management Science 34: 6.

Kirkwood, C. W. (1991). Notes on attitude toward risk taking and the exponential utility function. [Online]. Available from: http://www.public.asu.edu/~kirkwood/DAStuff/refs/risk.pdf[2006, August 25]

Lima, G. A. C., and Suslick, S. B. (2005). An integration of real options and utility theory for evaluation and strategic decision-making in oil development and production projects, SPE 94665 presented at the SPE Hydrocarbon Economics and Evaluation Symposium held in Dallas, TX, USA.

Mackay, J. A. (1995). Utilizing risk tolerance to optimize working interest, SPE 30043 presented at the 1995 SPE Hydrocarbon Economics and Evaluation Symposium held in Dallas, TX, USA.

Macmillan, F. (2000). Risk, uncertainty and investment decision making in the upstream oil and gas industry. Doctoral dissertation. University of Aberdeen.

Markowitz, H. M. (1991). Portfolio selections: Efficient diversification of investments. 2 nd rd. Oxford: Blackwell.

Mian, M. A. (2002). Project economics and decision analysis : Probabilistic models. Oklahoma: PennWell.

Moore, C. R. K., Moyes, C. P., and Patterson, P. D. (2005). The use of risk adjusted values in exploration portfolio management, SPE 94586 presented at the Hydrocarbon Economics and Evaluation Symposium held in Dallas, TX, U.S.A.

Motta, R. R., Caloba, G.M., Appi, C.J., and Moreira, A. B. (2001). Combining preference theory and CAPM efficient frontier : Towards an optimum portfolio of upstream projects. [Online]. Available from: http://www.palisade.com/articles/motta_preftheory.asp[2006, September 2].

Newendorp, P., and Schuyler, J. (2000). Decision analysis for petroleum exploration. 2 nd ed. Aurora: Planing Press.

Pinto, I. A., Suslick, S. B. and Furtado, R. (2003). An appraisal of corporate risk tolerance in the oil exploration and production. AAPG International Conference Barcelona, Spain.

Seba, R. D. (1998). Economics of worldwide petroleum production. 2 nd ed. U.S.A.: OGCI.

Swalm, R. O. (1966). Utility theory — Insights into risk taking. Harvard Business Review: 123-136.

Walls, M. R. (2005). Measuring and utilizing corporate risk tolerance to improve investment decision making. The Engineering Economist 50: 361-376.

Walls, M. R., and Clyman, D. R. (1998). Risky choice, risk sharing and decision analysis : Implications for managers in the resource sector. Resource Policy 24: 49-57.

Walls, M. R. and Dyer, J. S. (1996). Risk propensity and firm performance : A study of the petroleum exploration industry. Management Science 42: 1004-1020.

APPENDICES

APPENDIX A

THE FORMAT OF THE QUESTIONNAIRE

Risk Tolerance Questionnaire

Assure that all answers will be treated as confidential; all information will be kept securely at the university and in the final research report. The real names of people will not be used.

1. Job position

_____

2. What is the range of value of the project which you normally deal with?

☐ 0-25 million dollars   ☐ 25-50 million dollars

☐ 50-75 million dollars   ☐ 75-100 million dollars

☐ >100 million dollars

3. What is the probability of success (POS) of the projects you mostly deal with?

☐ 0-25%   ☐ 25-50%   ☐ 50-75%   ☐ 75-100%

4. In the case that the project fails, what is the range of money that you will lose per one failed project?

☐ 0-25 million dollars   ☐ 25-50 million dollars

☐ 50-75 million dollars   ☐ 75-100 million dollars

☐ >100 million dollars

5. Suggestions/Recommendations

_____
_____
_____
_____
_____

Risk Tolerance Questionnaire (GROUP A)

Assumed that you have *30 million dollars* as your annual budget constraints and you are presented with the following twelve risky prospects as part of your budgetary considerations. Select your preferred participation level for each prospect. Note that you are asked to make these choices as a corporate decision maker, not as a private individual dealing with your own funds.

Prospect	Outcome	Probability	Value of Outcome (million dollars)	Choice (Participation Level)					
1	Success	0.50	20	100%	75%	50%	25%	15%	0%
	Failure	0.50	-10						
2	Success	0.55	40	100%	75%	50%	25%	15%	0%
	Failure	0.45	-9						
3	Success	0.40	80	100%	75%	50%	25%	15%	0%
	Failure	0.60	-10						
4	Success	0.50	100	100%	75%	50%	25%	15%	0%
	Failure	0.50	-20						
5	Success	0.35	50	100%	75%	50%	25%	15%	0%
	Failure	0.65	-7						
6	Success	0.45	60	100%	75%	50%	25%	15%	0%
	Failure	0.55	-16.5						
7	Success	0.40	150	100%	75%	50%	25%	15%	0%
	Failure	0.60	-12						
8	Success	0.40	50	100%	75%	50%	25%	15%	0%
	Failure	0.60	-8						
9	Success	0.45	70	100%	75%	50%	25%	15%	0%
	Failure	0.55	-10						
10	Success	0.35	125	100%	75%	50%	25%	15%	0%
	Failure	0.65	-12						
11	Success	0.60	30	100%	75%	50%	25%	15%	0%
	Failure	0.40	-6						
12	Success	0.45	50	100%	75%	50%	25%	15%	0%
	Failure	0.55	-9						

Risk Tolerance Questionnaire (GROUP B)

Assumed that you have *30 million dollars* as your annual budget constraints and you are presented with the following twelve risky prospects as part of your budgetary considerations. Select your preferred participation level for each prospect. Note that you are asked to make these choices as a corporate decision maker, not as a private individual dealing with your own funds.

Prospect	Outcome	Probability	Value of Outcome (million dollars)	Choice (Participation Level)					
1	Success	0.15	70	100%	75%	50%	25%	15%	0%
	Failure	0.85	-5						
2	Success	0.25	22	100%	75%	50%	25%	15%	0%
	Failure	0.75	-7.5						
3	Success	0.50	35	100%	75%	50%	25%	15%	0%
	Failure	0.50	-15						
4	Success	0.20	15	100%	75%	50%	25%	15%	0%
	Failure	0.80	-2.5						
5	Success	0.20	45	100%	75%	50%	25%	15%	0%
	Failure	0.80	-5						
6	Success	0.50	55	100%	75%	50%	25%	15%	0%
	Failure	0.50	-20						
7	Success	0.20	100	100%	75%	50%	25%	15%	0%
	Failure	0.80	-5						
8	Success	0.40	20	100%	75%	50%	25%	15%	0%
	Failure	0.60	-7.5						
9	Success	0.25	90	100%	75%	50%	25%	15%	0%
	Failure	0.75	-8						
10	Success	0.50	12.5	100%	75%	50%	25%	15%	0%
	Failure	0.50	-2.5						
11	Success	0.35	40	100%	75%	50%	25%	15%	0%
	Failure	0.65	-11.5						
12	Success	0.20	80	100%	75%	50%	25%	15%	0%
	Failure	0.80	-7.5						

APPENDIX B

THE VALUES OF RISK TOLERANCE, CERTAINTY EQUIVALENT AND UTILITY OF THE QUESTIONNAIRE

GROUP A: THE SUMMARY OF *RT*, *CE* AND *UTILITY* VALUES OF THE QUESTIONNAIRE.

Pros.	xi	Prob.	EMV	RT and CE when WI equal								U(x₁) when WI equal			
				75%		50%		25%		15%		75%	50%	25%	15%
				RT	CE	RT	CE	RT	CE	RT	CE				
1	20	0.50	5	32.5	1.8406	21.5	1.2176	11	0.6228	6.5	0.3681	12.0148	7.9967	4.0179	2.4030
	-10	0.50										-8.4360	-5.6292	-2.8069	-1.6872
2	40	0.55	17.95	21.7	6.1787	14.5	4.1286	7.3	2.0784	4.3	1.2243	16.2543	10.8496	5.4448	3.2347
	-9	0.45										-7.9177	-5.2765	-2.6353	-1.5860
3	80	0.40	26	40.5	8.3852	27	5.5901	13.5	2.7951	8	1.6563	31.2943	20.8629	10.4314	6.2150
	-10	0.60										-8.2394	-5.4929	-2.7465	-1.6498
4	100	0.50	40	56	13.5848	37.5	9.0967	19	4.6079	11	2.6679	41.3262	27.6151	13.9030	8.1870
	-20	0.50										-17.2010	-11.4602	-5.7196	-3.4490
5	50	0.35	12.95	31.7	4.2581	21	2.8207	10.5	1.4104	6.5	0.8728	21.9881	14.6144	7.3072	4.4498
	-7	0.65										-5.7098	-3.8086	-1.9043	-1.1396
6	60	0.45	17.925	53	6.3452	35	4.1904	17.5	2.0952	10.5	1.2571	30.3256	20.1470	10.0735	6.0441
	-16.5	0.55										-13.9390	-9.3034	-4.6517	-2.7910
7	150	0.40	52.8	57	15.7778	38	10.5185	19	5.2593	11.5	3.1833	49.0802	32.7201	16.3601	9.8745
	-12	0.60										-9.7494	-6.4996	-3.2498	-1.9485
8	50	0.40	15.2	30.5	5.0496	20.5	3.3938	10	1.6553	6	0.9932	21.5807	14.4448	7.1350	4.2810
	-8	0.60										-6.6308	-4.4169	-2.2140	-1.3284
9	70	0.45	26	34.5	8.4921	23	5.6614	11.5	2.8307	7	1.7227	26.9676	17.9784	8.9892	5.4381
	-10	0.55										-8.3776	-5.5851	-2.7925	-1.6728
10	125	0.35	35.95	59.5	11.1905	40	7.5228	20	3.7614	12	2.2568	47.1908	31.6155	15.8078	9.4847
	-12	0.65										-9.7163	-6.4734	-3.2367	-1.9420
11	30	0.60	15.6	13.4	5.3352	9	3.5832	4.5	1.7916	2.6	1.0345	10.9004	7.3001	3.6501	2.1394
	-6	0.40										-5.3478	-3.5605	-1.7803	-1.0754
12	50	0.45	17.55	29.3	5.8996	19.5	3.9264	9.7	1.9531	6	1.2075	21.1524	14.0894	7.0263	4.2810
	-9	0.55										-7.5908	-5.0616	-2.5324	-1.5139

GROUP B: THE SUMMARY OF *RT*, *CE* AND *UTILITY* VALUES OF THE QUESTIONNAIRE.

| Pros.	xi	Prob.	EMV	RT and CE when WI equal								U(xi) when WI equal			
				75%		50%		25%		15%		75%	50%	25%	15%
				RT	CE	RT	CE	RT	CE	RT	CE				
1	70 / -5	0.15 / 0.85	6.25	62	2.0602	41.5	1.3790	21	0.6977	12.5	0.4154	35.4147 / -3.8657	23.6444 / -2.5768	11.8734 / -1.2880	7.1036 / -0.7730
2	22 / -7.5	0.25 / 0.75	-0.125	–	–	–	–	–	–	–	–	–	–	–	–
3	35 / -15	0.50 / 0.50	10	44.5	3.6615	29.5	2.4273	15	1.2339	9	0.7404	19.8297 / -12.7999	13.1999 / -8.5396	6.6295 / -4.2604	3.9777 / -2.5562
4	15 / -2.5	0.20 / 0.80	1	32	0.3542	21.5	0.2380	10.7	0.1184	6.5	0.0719	9.4852 / -1.9310	6.3316 / -1.2871	3.1634 / -0.6436	1.9019 / -0.3860
5	45 / -5	0.20 / 0.80	5	46.5	1.7060	31	1.1374	15.5	0.5687	9.5	0.3484	23.9971 / -3.9054	15.9980 / -2.6036	7.9990 / -1.3018	4.8318 / -0.7804
6	55 / -20	0.50 / 0.50	17.5	55.5	6.2844	37	4.1896	18.5	2.0948	11	1.2454	29.1059 / -17.2227	19.4039 / -11.4818	9.7020 / -5.7409	5.8040 / -3.4490
7	100 / -5	0.20 / 0.80	16	49	4.7880	32.5	3.1757	16.5	1.6121	10	0.9769	38.3962 / -3.8972	25.5219 / -2.5987	12.8737 / -1.2986	7.7687 / -0.7788
8	20 / -7.5	0.40 / 0.60	3.5	36	1.2763	24	0.8509	12	0.4254	7	0.2480	12.2673 / -6.0883	8.1782 / -4.0588	4.0891 / -2.0294	2.4399 / -1.2204
9	90 / -8	0.25 / 0.75	16.5	55.5	5.2517	37	3.5011	18.5	1.7506	11	1.0408	39.0526 / -6.3363	26.0351 / -4.2242	13.0175 / -2.1121	7.7760 / -1.2679
10	12.5 / -2.5	0.50 / 0.50	5	7	1.6981	4.7	1.1401	2.3	0.5579	1.4	0.3396	5.1658 / -2.1501	3.4567 / -1.4320	1.7089 / -0.7182	1.0332 / -0.4300
11	40 / -11.5	0.35 / 0.65	6.525	61.5	2.3346	41	1.5564	20.5	0.7782	12	0.4553	23.7407 / -9.2591	15.8271 / -6.1727	7.9136 / -3.0864	4.7216 / -1.8551
12	80 / -7.5	0.20 / 0.80	10	67	3.3138	45	2.2256	22	1.0880	13	0.6426	39.6376 / -5.8679	26.4999 / -3.9107	13.1364 / -1.9572	7.8352 / -1.1751

It is noted that there is no value of RT, CE and utility in the prospect 2. Since this prospect is intentionally created to give the negative EMV. Consequently, there is no any values shown in this project.

APPENDIX C
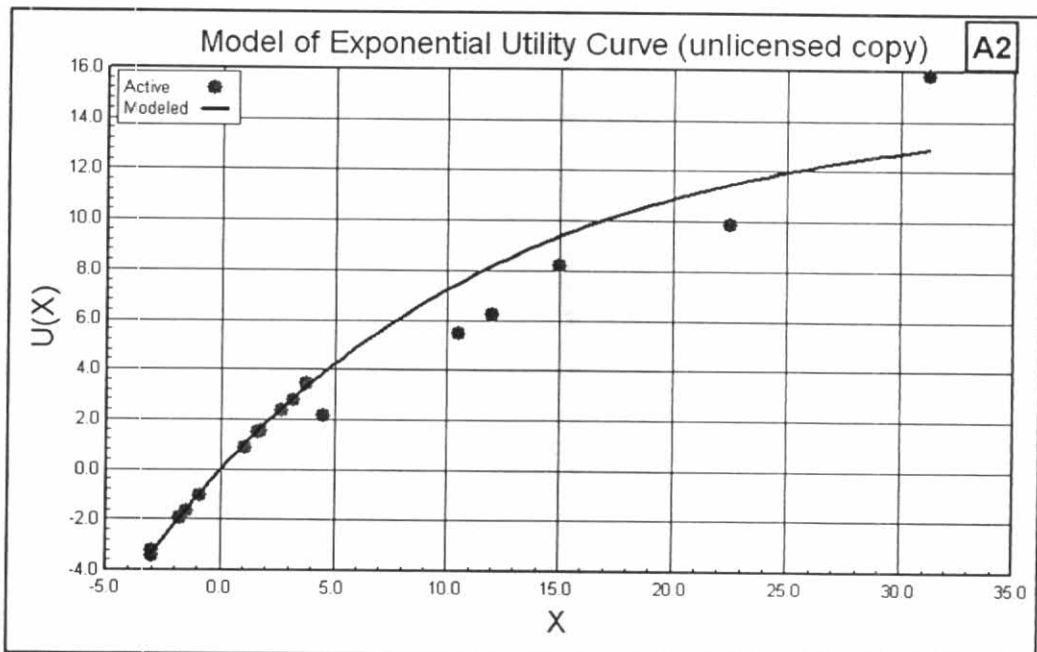
THE PREFERENCE CURVES OF SAMPLES

GROUP A: Replied Results and Preference Curve of A1.

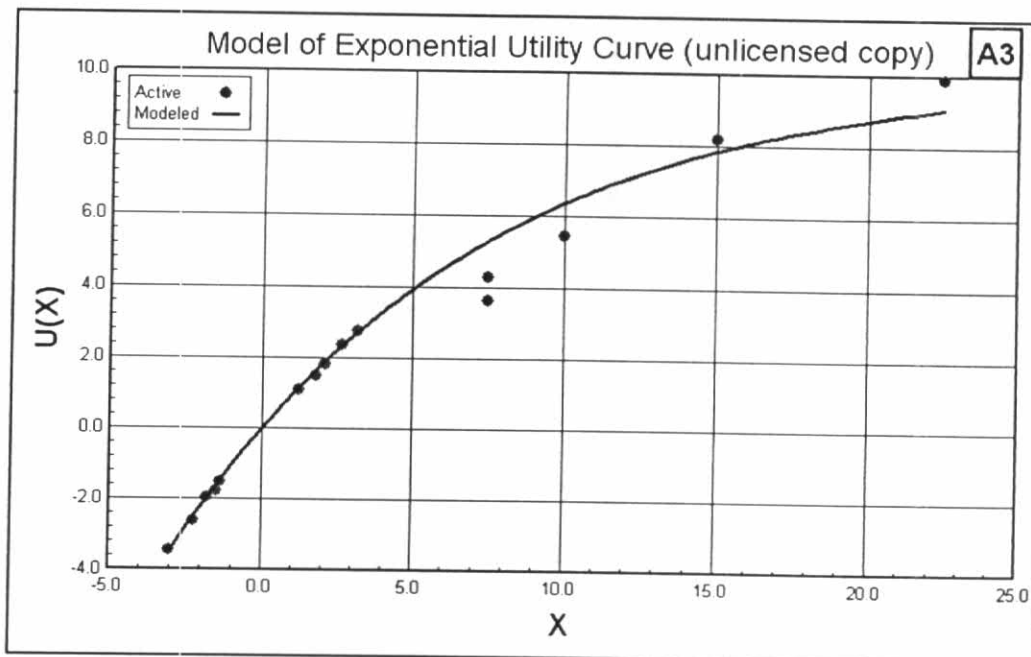| Prospect	A1. Sr. Manager						
	xi	pi	WI	RT	U(xi)	CE	EU
1	20	0.50	25%	11.0	4.0179	0.6228	0.6055
	-10	0.50			-2.8069		
2	40	0.55	50%	14.5	10.8496	4.1286	3.5929
	-9	0.45			-5.2765		
3	80	0.40	25%	13.5	10.4314	2.7951	2.5247
	-10	0.60			-2.7465		
4	100	0.50	25%	19.0	13.9030	4.6079	4.0917
	-20	0.50			-5.7196		
5	50	0.35					
	-7	0.65					
6	60	0.45					
	-16.5	0.55					
7	150	0.40	25%	19.0	16.3601	5.2593	4.5941
	-12	0.60			-3.2498		
8	50	0.40	25%	10.0	7.1350	1.6553	1.5256
	-8	0.60			-2.2140		
9	70	0.45	25%	11.5	8.9892	2.8307	2.5092
	-10	0.55			-2.7925		
10	125	0.35	15%	12.0	9.4847	2.2568	2.0573
	-12	0.65			-1.9420		
11	30	0.60	50%	9.0	7.3001	3.5832	2.9559
	-6	0.40			-3.5605		
12	50	0.45	25%	9.7	7.0263	1.9531	1.7690
	-9	0.55			-2.5324		
RT				15.28			
CM				0.27			

Model of Exponential Utility Curve (unlicensed copy) A1
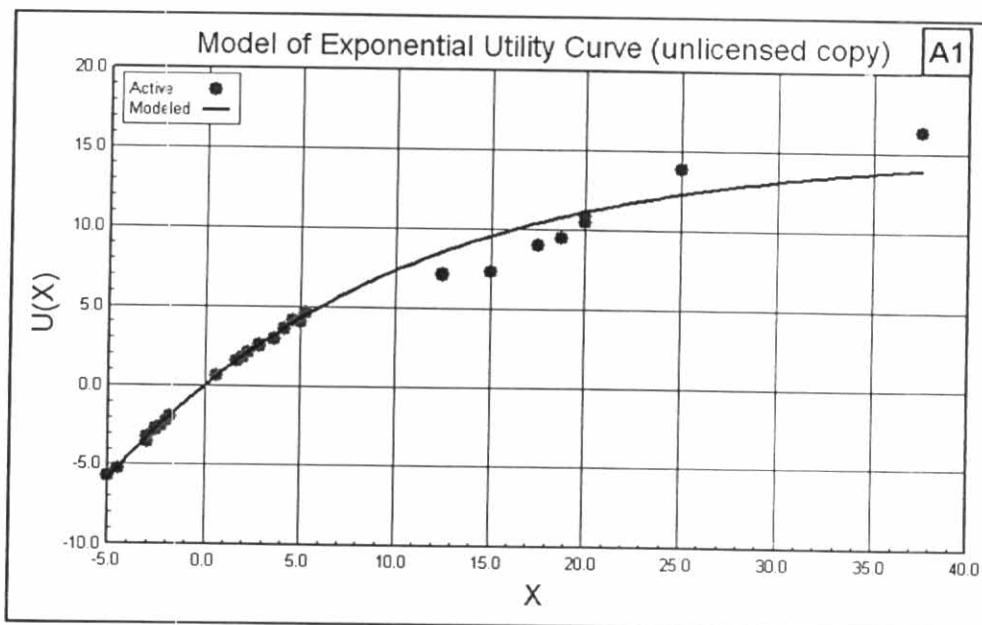
GROUP A: Replied Results and Preference Curve of A2.

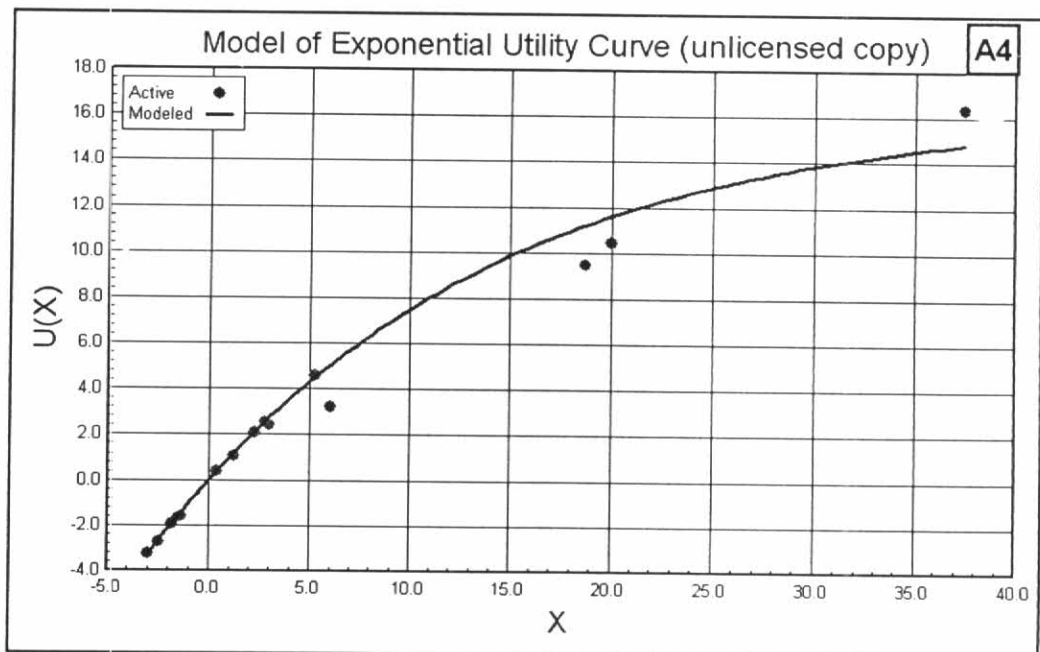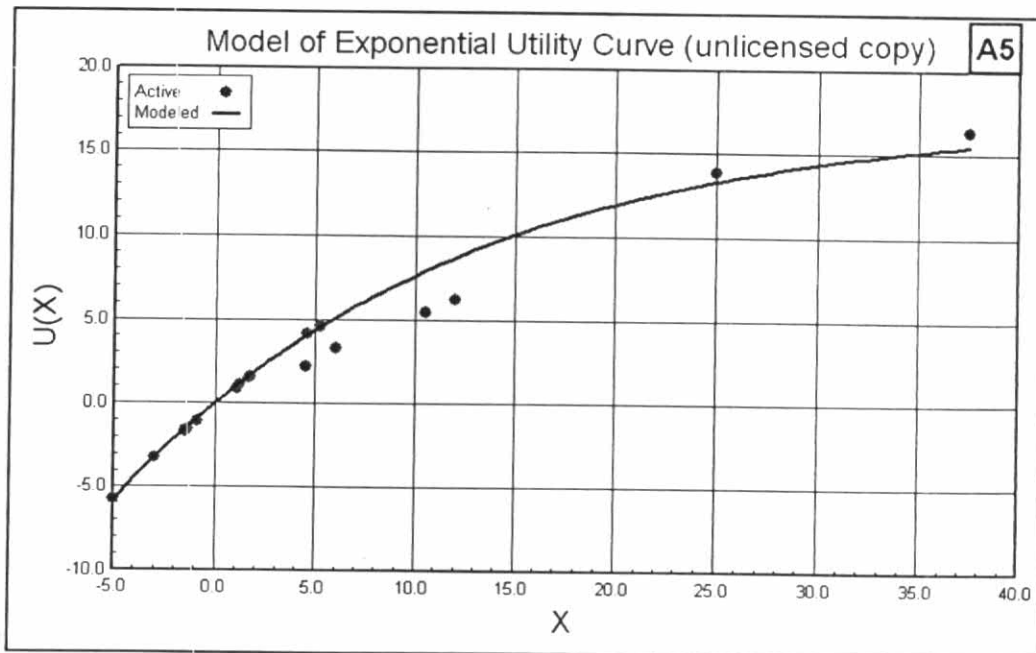| Prospect	A2. Sr. Manager						
	xi	pi	WI	RT	U(xi)	CE	EU
1	20	0.50					
	-10	0.50					
2	40	0.55	0%			0.0000	
	-9	0.45					
3	80	0.40	15%	8.0	6.2150	1.6563	1.4961
	-10	0.60			-1.6498		
4	100	0.50	15%	11.0	8.1870	2.6679	2.3690
	-20	0.50			-3.4490		
5	50	0.35					
	-7	0.65					
6	60	0.45	0%				
	-16.5	0.55					
7	150	0.40	15%	11.5	9.8745	3.1833	2.7807
	-12	0.60			-1.9485		
8	50	0.40	0%			0.0000	
	-8	0.60					
9	70	0.45	15%	7.0	5.4381	1.7227	1.5271
	-10	0.55			-1.6728		
10	125	0.35	25%	20.0	15.8078	3.7614	3.4289
	-12	0.65			-3.2367		
11	30	0.60	15%	2.6	2.1394	1.0345	0.8535
	-6	0.40			-1.0754		
12	50	0.45	0%			0.0000	
	-9	0.55					
RT	14.59						
CM	0.48						

Model of Exponential Utility Curve (unlicensed copy) A2

GROUP A: Replied Results and Preference Curve of A4.

Prospect	A4. Manager						
	xi	pi	WI	RT	U(xi)	CE	EU
1	20 -10	0.50 0.50	15%	6.5	2.4030 -1.6872	0.3681	0.3579
2	40 -9	0.55 0.45	15%	4.3	3.2347 -1.5860	1.2243	1.0654
3	80 -10	0.40 0.60	25%	13.5	10.4314 -2.7465	2.7951	2.5247
4	100 -20	0.50 0.50					
5	50 -7	0.35 0.65					
6	60 -16.5	0.45 0.55					
7	150 -12	0.40 0.60	25%	19.0	16.3601 -3.2498	5.2593	4.5941
8	50 -8	0.40 0.60					
9	70 -10	0.45 0.55					
10	125 -12	0.35 0.65	15%	12.0	9.4847 -1.9420	2.2568	2.0573
11	30 -6	0.60 0.40					
12	50 -9	0.45 0.55					
RT				16.50			
CM				0.46			

Model of Exponential Utility Curve (unlicensed copy) — A4

GROUP A: Replied Results and Preference Curve of A5.

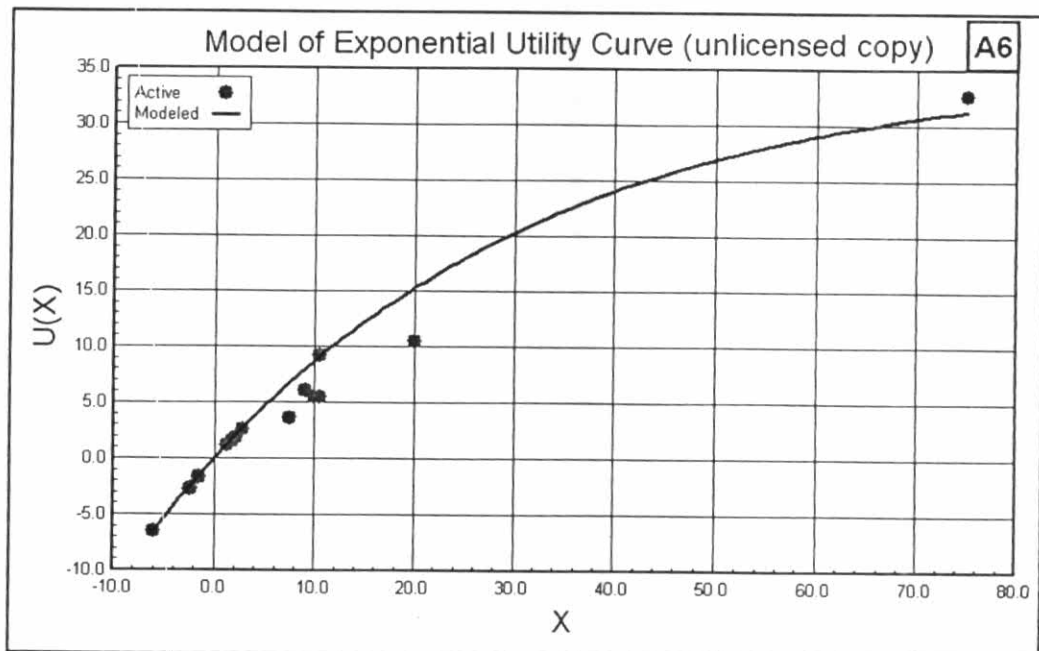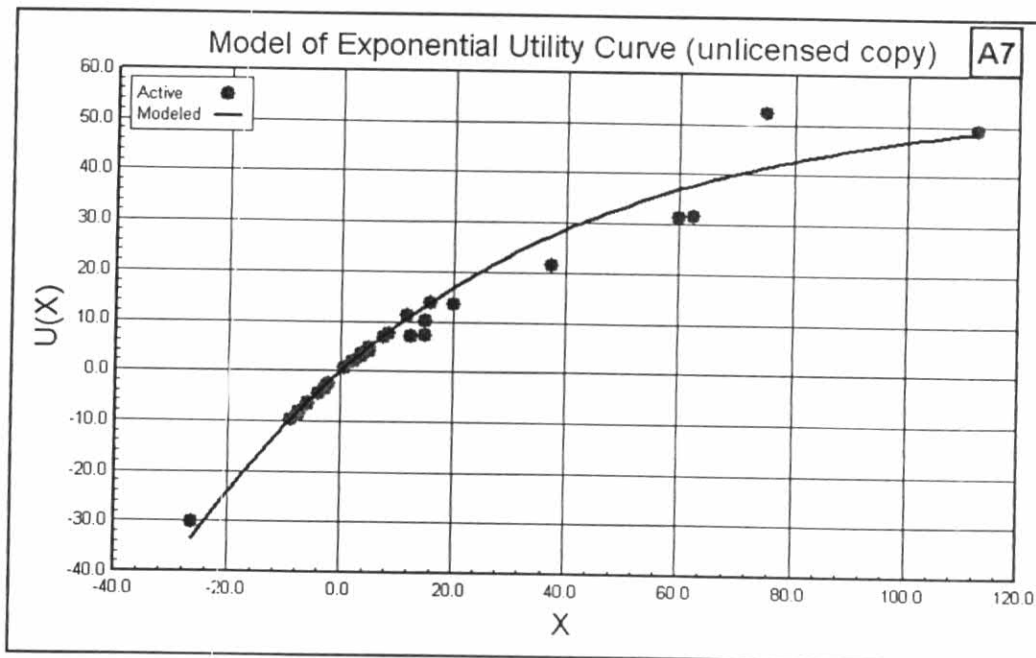| Prospect	A5. Manager						
	xi	pi	WI	RT	U(xi)	CE	EU
1	20	0.50	0%			0.0000	
	-10	0.50					
2	40	0.55	15%	4.3	3.2347	1.2243	1.0654
	-9	0.45			-1.5860		
3	80	0.40	15%	8.0	6.2150	1.6563	1.4961
	-10	0.60			-1.6498		
4	100	0.50	25%	19.0	13.9030	4.6079	4.0917
	-20	0.50			-5.7196		
5	50	0.35	0%			0.000	
	-7	0.65					
6	60	0.45	0%			0.000	
	-16.5	0.55					
7	150	0.40	25%	19.0	16.3601	5.2593	4.5941
	-12	0.60			-3.2498		
8	50	0.40	0%			0.0000	
	-8	0.60					
9	70	0.45	15%	7.0	5.4381	1.7227	1.5271
	-10	0.55			-1.6728		
10	125	0.35	0%			0.0000	
	-12	0.65					
11	30	0.60	15%	2.6	2.1394	1.0345	0.8535
	-6	0.40			-1.0754		
12	50	0.45	0%			0.0000	
	-9	0.55					
RT				17.53			
CM				0.57			

Model of Exponential Utility Curve (unlicensed copy) A5

GROUP A: Replied Results and Preference Curve of A6.

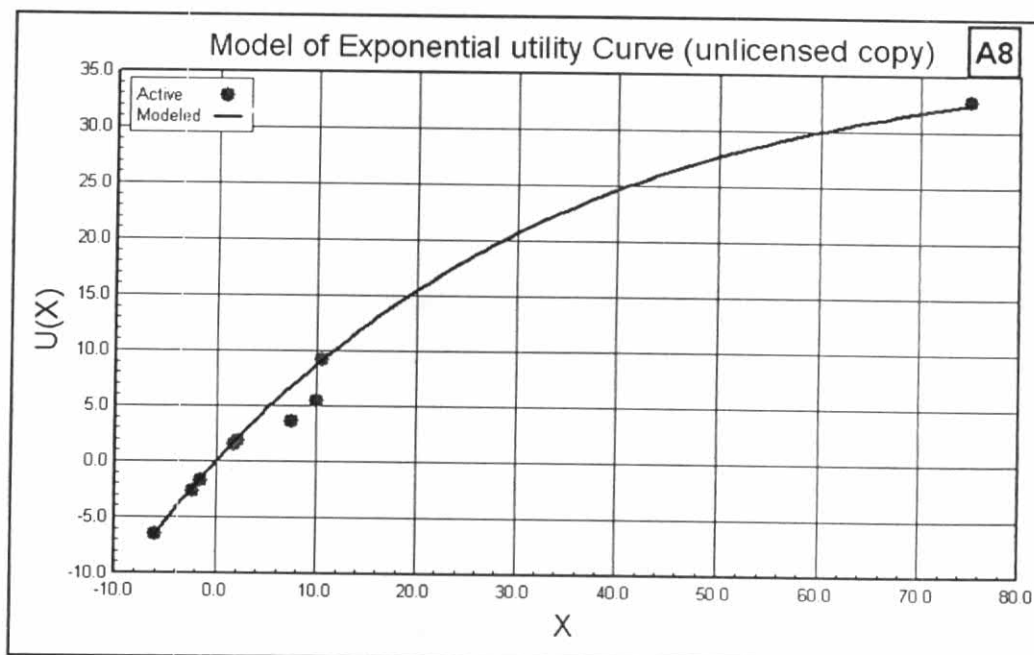| Prospect	A6. Manager						
	xi	pi	WI	RT	U(xi)	CE	EU
1	20	0.50	0%			0.0000	
	-10	0.50					
2	40	0.55	25%	7.3	5.4448	2.0784	1.8087
	-9	0.45			-2.6353		
3	80	0.40	25%	13.5	10.4314	2.7951	2.5247
	-10	0.60			-2.7465		
4	100	0.50	0%			0.0000	
	-20	0.50					
5	50	0.35	0%			0.000	
	-7	0.65					
6	60	0.45	15%	10.5	6.044	1.257	1.185
	-16.5	0.55			-2.791		
7	150	0.40	50%	38.0	32.7201	10.5185	9.1883
	-12	0.60			-6.4996		
8	50	0.40	0%			0.0000	
	-8	0.60					
9	70	0.45	15%	7.0	5.4381	1.7227	1.5271
	-10	0.55			-1.6728		
10	125	0.35	0%			0.0000	
	-12	0.65					
11	30	0.60	25%	4.5	3.6501	1.7916	1.4779
	-6	0.40			-1.7803		
12	50	0.45	0%			0.0000	
	-9	0.55					
RT				35.65			
CM				0.70			

Model of Exponential Utility Curve (unlicensed copy) — A6

GROUP A: Replied Results and Preference Curve of A7.

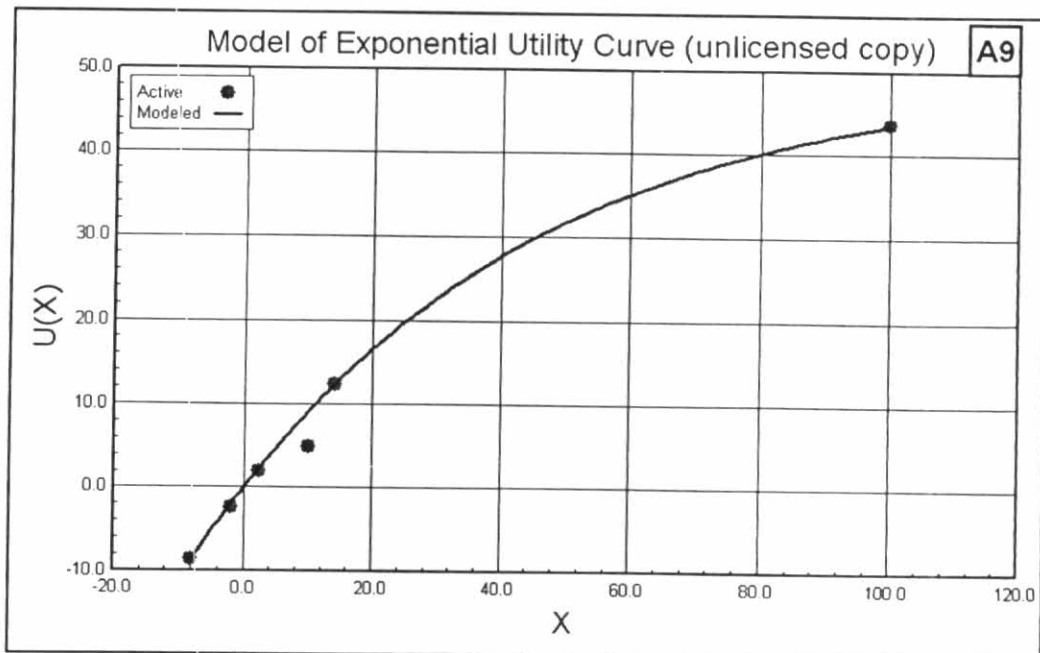| Prospect	A7. Manager						
	xi	pi	WI	RT	U(xi)	CE	EU
1	20 -10	0.50 0.50	25%	11.0	4.0179 -2.8069	0.6228	0.6055
2	40 -15	0.55 0.45	50%	23.2	13.4029 -8.8542	3.6615	3.3872
3	80 -10	0.40 0.60	75%	40.5	31.2943 -8.2394	8.3852	7.5741
4	100 -35	0.50 0.50	75%	97.0	52.2310 -30.1452	11.7237	11.0429
5	50 -7	0.35 0.65					
6	60 -16.5	0.45 0.55	25%	17.5	10.073 -4.652	2.095	1.975
7	150 -12	0.40 0.60	75%	57.0	49.0802 -9.7494	15.7778	13.7824
8	50 -8	0.40 0.60	75%	30.5	21.5807 -6.6308	5.0496	4.6538
9	70 -10	0.45 0.55					
10	125 -12	0.35 0.65	50%	40.0	31.6155 -6.4734	7.5228	6.8578
11	30 -6	0.60 0.40	50%	9.0	7.3001 -3.5605	3.5832	2.9559
12	50 -9	0.45 0.55	25%	9.7	7.0263 -2.5324	1.9531	1.7690
RT				56.33			
CM				0.61			

Model of Exponential Utility Curve (unlicensed copy) A7

GROUP A: Replied Results and Preference Curve of A8.

Prospect	A8. Manager						
	xi	pi	WI	RT	U(xi)	CE	EU
1	20 -10	0.50 0.50	0%			0.0000	
2	40 -9	0.55 0.45	25%	7.3	5.4448 -2.6353	2.0784	1.8087
3	80 -10	0.40 0.60	0%			0.0000	
4	100 -20	0.50 0.50	0%			0.0000	
5	50 -7	0.35 0.65	0%			0.000	
6	60 -16.5	0.45 0.55	0%			0.000	
7	150 -12	0.40 0.60	50%	38.0	32.7201 -6.4996	10.5185	9.1883
8	50 -8	0.40 0.60	0%			0.0000	
9	70 -10	0.45 0.55	0%			0.0000	
10	125 -12	0.35 0.65	0%			0.0000	
11	30 -6	0.60 0.40	25%	4.5	3.6501 -1.7803	1.7916	1.4779
12	50 -9	0.45 0.55	0%			0.0000	
RT				37.56			
CM				0.69			

Model of Exponential utility Curve (unlicensed copy) — A8

GROUP A: Replied Results and Preference Curve of A9.

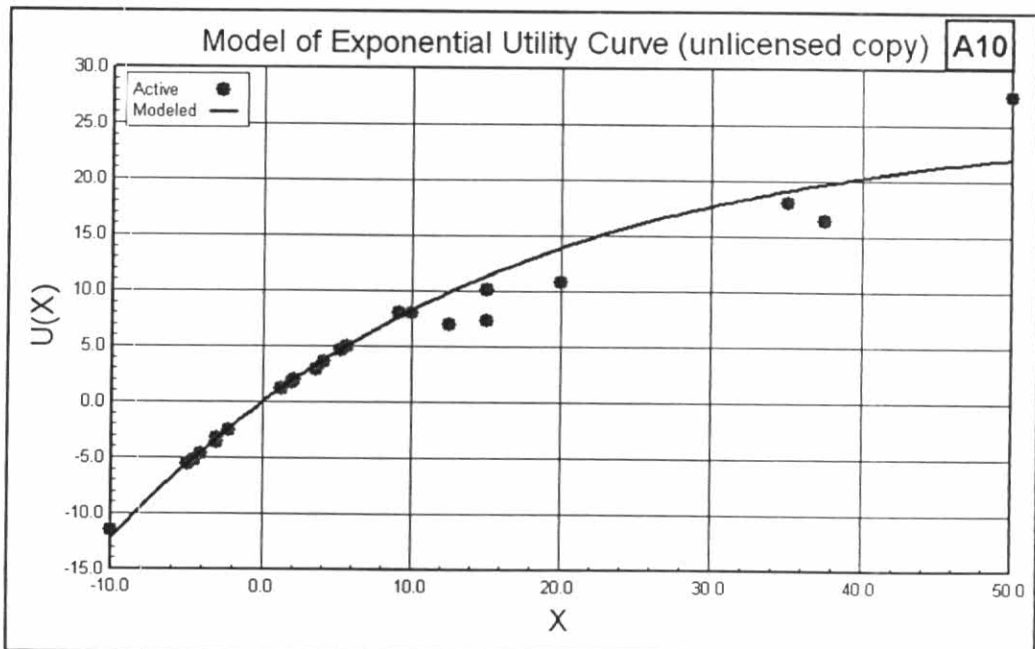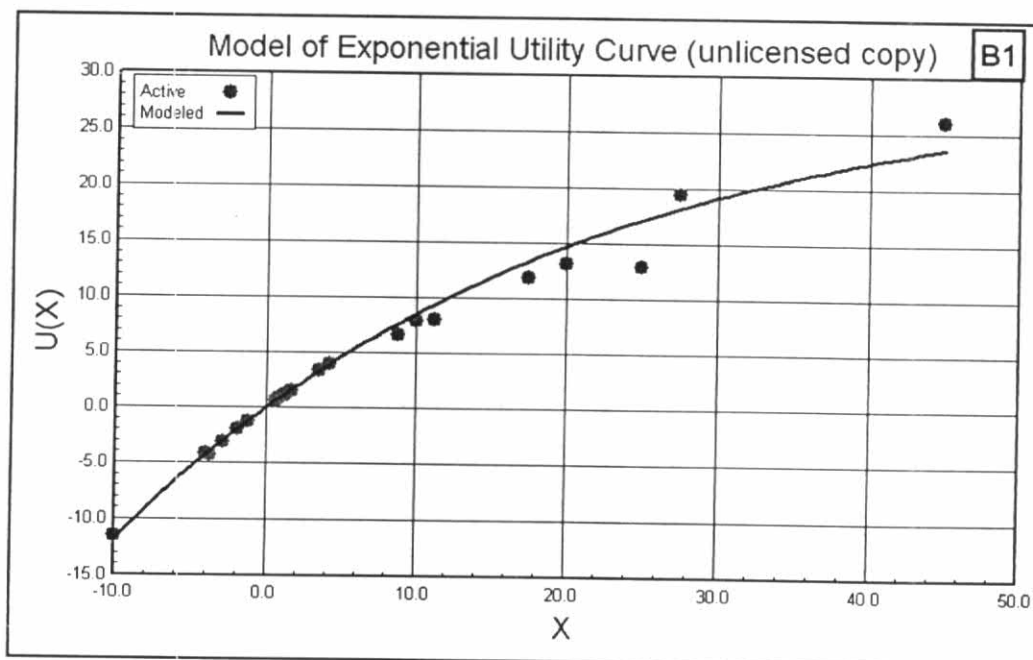| Prospect	xi	pi	WI	RT	U(xi)	CE	EU
				A9. Manager			
1	20	0.50					
	-10	0.50					
2	40	0.55					
	-9	0.45					
3	80	0.40					
	-10	0.60					
4	100	0.50					
	-20	0.50					
5	50	0.35					
	-7	0.65					
6	60	0.45					
	-16.5	0.55					
7	150	0.40	67%	50.7	43.6471	14.0340	12.2591
	-12	0.60			-8.6662		
8	50	0.40					
	-8	0.60					
9	70	0.45					
	-10	0.55					
10	125	0.35					
	-12	0.65					
11	30	0.60	33%	6.0	4.8666	2.3888	1.9706
	-6	0.40			-2.3734		
12	50	0.45					
	-9	0.55					
RT				50.49			
CM				0.62			

Model of Exponential Utility Curve (unlicensed copy) — A9

GROUP A: Replied Results and Preference Curve of A10.

Prospect	A9. Manager						
	xi	pi	WI	RT	U(xi)	CE	EU
1	20 -10	0.50 0.50	50%	21.5	7.9967 -5.6292	1.2176	1.1837
2	40 -9	0.55 0.45	50%	14.5	10.8496 -5.2765	4.1286	3.5929
3	80 -10	0.40 0.60					
4	100 -20	0.50 0.50	50%	37.5	27.6151 -11.4602	9.0967	8.0775
5	50 -7	0.35 0.65					
6	60 -16.5	0.45 0.55	25%	17.5	10.073 -4.652	2.095	1.975
7	150 -12	0.40 0.60	25%	19.0	16.3601 -3.2498	5.2593	4.5941
8	50 -8	0.40 0.60					
9	70 -10	0.45 0.55	50%	23.0	17.9784 -5.5851	5.6614	5.0185
10	125 -12	0.35 0.65					
11	30 -6	0.60 0.40	50%	9.0	7.3001 -3.5605	3.5832	2.9559
12	50 -9	0.45 0.55	25%	9.7	7.0263 -2.5324	1.9531	1.7690
RT				25.66			
CM				0.42			

Model of Exponential Utility Curve (unlicensed copy) A10

GROUP B: Replied Results and Preference Curve of B1.

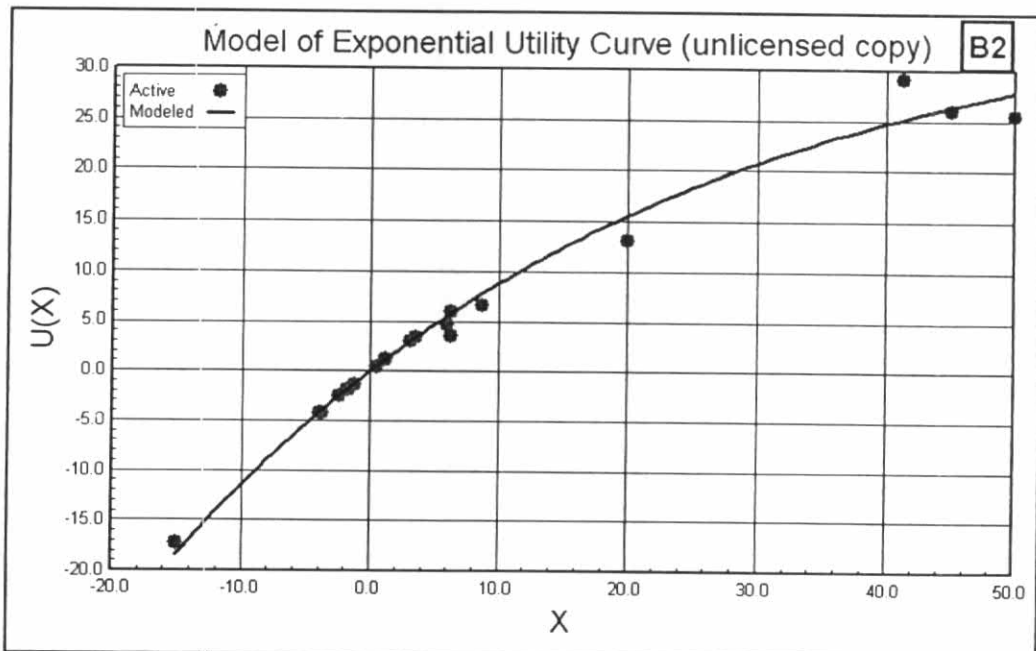| Prospect	B1. Sr. Analyst						
	xi	pi	WI	RT	U(xi)	CE	EU
1	70	0.15	25%	21.0	11.8734	0.6977	0.6863
	-5	0.85			-1.2880		
2	22	0.25	0%			0.0000	
	-7.5	0.75					
3	35	0.50	25%	15.0	6.6295	1.2339	1.1845
	-15	0.50			-4.2604		
4	15	0.20	0%			0.0000	
	-2.5	0.80					
5	45	0.20	25%	15.5	7.999	0.569	0.558
	-5	0.80			-1.302		
6	55	0.50	50%	37.0	19.404	4.190	3.961
	-20	0.50			-11.482		
7	100	0.20	25%	16.5	12.8737	1.6121	1.5359
	-5	0.80			-1.2986		
8	20	0.40	0%			0.0000	
	-7.5	0.60					
9	90	0.25	50%	37.0	26.0351	3.5011	3.3406
	-8	0.75			-4.2242		
10	12.5	0.50	0%			0.0000	
	-2.5	0.50					
11	40	0.35	25%	20.5	7.9136	0.7782	0.7636
	-11.5	0.65			-3.0864		
12	80	0.20	25%	22.0	13.1364	1.0880	1.0615
	-7.5	0.80			-1.9572		
RT				30.69			
CM				0.37			

Model of Exponential Utility Curve (unlicensed copy) B1

GROUP B: Replied Results and Preference Curve of B2.

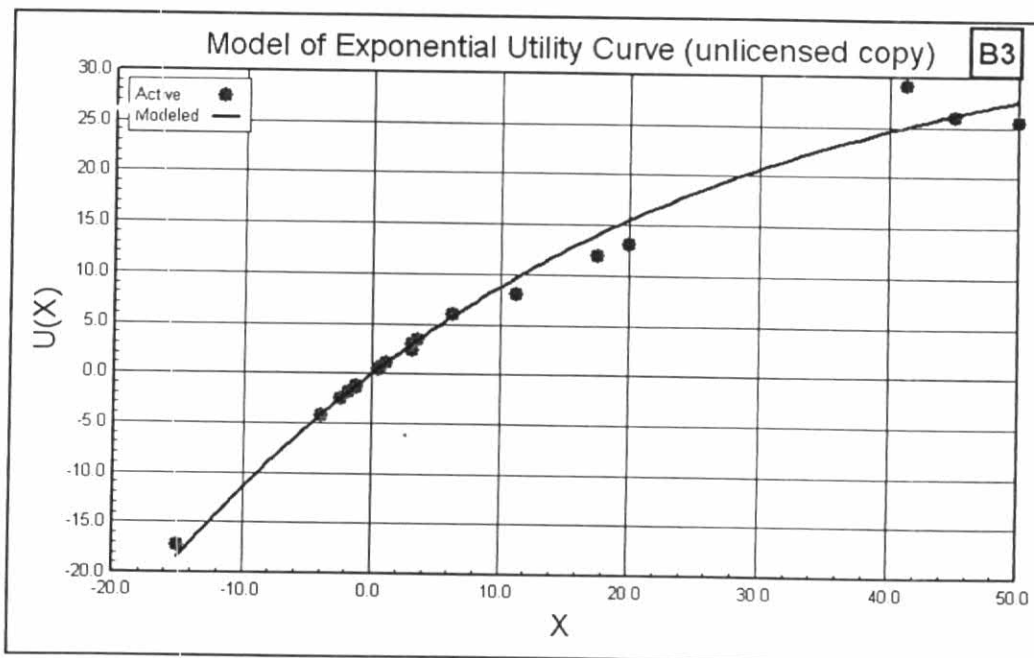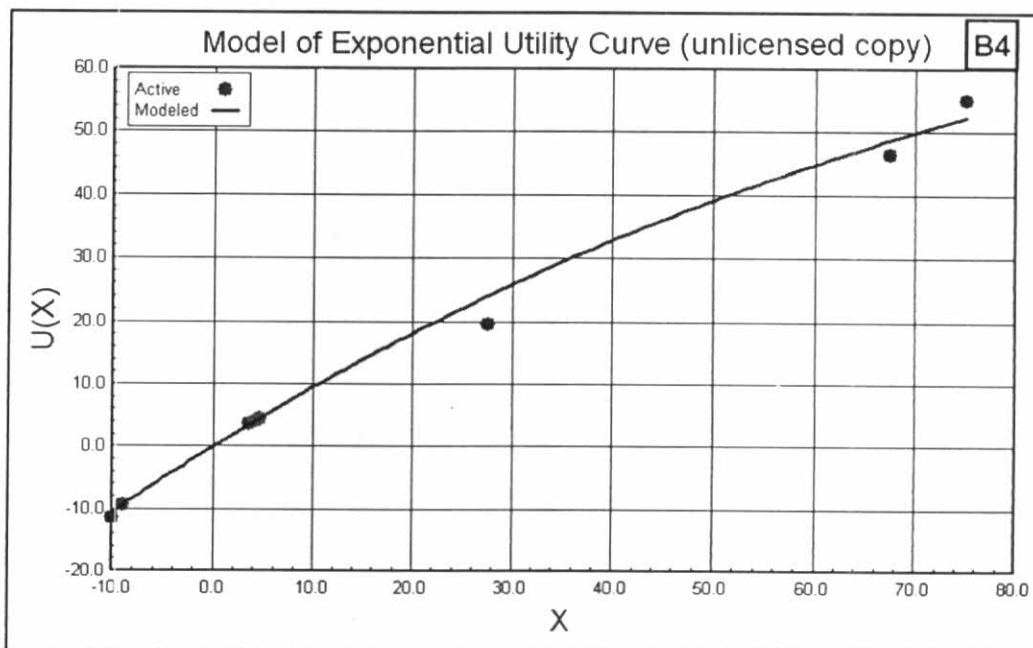| Prospect	B2. Analyst						
	xi	pi	WI	RT	U(xi)	CE	EU
1	70	0.15					
	-5	0.85					
2	22	0.25	0%			0.0000	
	-7.5	0.75					
3	35	0.50	25%	15.0	6.6295	1.2339	1.1845
	-15	0.50			-4.2604		
4	15	0.20	0%			0.0000	
	-2.5	0.80					
5	45	0.20	0%			0.0000	
	-5	0.80					
6	55	0.50	75%	55.5	29.106	6.284	5.942
	-20	0.50			-17.223		
7	100	0.20	50%	32.5	25.5219	3.1757	3.0254
	-5	0.80			-2.5987		
8	20	0.40	0%			0.0000	
	-7.5	0.60					
9	90	0.25	50%	37.0	26.0351	3.5011	3.3406
	-8	0.75			-4.2242		
10	12.5	0.50	50%	4.7	3.4567	1.1401	1.0123
	-2.5	0.50			-1.4320		
11	40	0.35	15%	12.0	4.7216	0.4553	0.4467
	-11.5	0.65			-1.8551		
12	80	0.20	25%	22.0	13.1364	1.0880	1.0615
	-7.5	0.80			-1.9572		
RT				38.01			
CM				0.54			

Model of Exponential Utility Curve (unlicensed copy) B2

GROUP B: Replied Results and Preference Curve of B3.

| Prospect	B3. Analyst						
	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
1	70 -5	0.15 0.85	25%	21.0	11.8734 -1.2880	0.6977	0.6863
2	22 -7.5	0.25 0.75	0%			0.0000	
3	35 -15	0.50 0.50	0%			0.0000	
4	15 -2.5	0.20 0.80	0%			0.0000	
5	45 -5	0.20 0.80	25%	15.5	7.999 -1.302	0.5687	0.558
6	55 -20	0.50 0.50	75%	55.5	29.106 -17.223	6.284	5.942
7	100 -5	0.20 0.80	50%	32.5	25.5219 -2.5987	3.1757	3.0254
8	20 -7.5	0.40 0.60	0%			0.0000	
9	90 -8	0.25 0.75	50%	37.0	26.0351 -4.2242	3.5011	3.3406
10	12.5 -5	0.50 0.50	25%	4.8	2.2968 -1.4279	0.4554	0.4345
11	40 -11.5	0.35 0.65	0%			0.0000	
12	80 -7.5	0.20 0.80	25%	22.0	13.1364 -1.9572	1.0880	1.0615
RT				37.56			
CM				0.50			

Model of Exponential Utility Curve (unlicensed copy) — B3

GROUP B: Replied Results and Preference Curve of B4.

| Prospect	B4. Analyst						
	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
1	70 -5	0.15 0.85	0%			0.0000	
2	22 -7.5	0.25 0.75	0%			0.0000	
3	35 -15	0.50 0.50	0%			0.0000	
4	15 -2.5	0.20 0.80	0%			0.0000	
5	45 -5	0.20 0.80	0%			0.0000	
6	55 -20	0.50 0.50	50%	37.0	19.404 -11.482	4.190	3.961
7	100 -12	0.20 0.80	75%	115.0	55.0951 -9.3615	3.5851	3.5298
8	20 -7.5	0.40 0.60	0%			0.0000	
9	90 -12	0.25 0.75	75%	84.0	46.3909 -9.4998	4.5963	4.4729
10	12.5 -2.5	0.50 0.50	0%			0.0000	
11	40 -11.5	0.35 0.65	0%			0.0000	
12	80 -7.5	0.20 0.80	0%			0.0000	
RT				97.30			
CM				0.38			

Model of Exponential Utility Curve (unlicensed copy) B4

GROUP B: Replied Results and Preference Curve of B5.

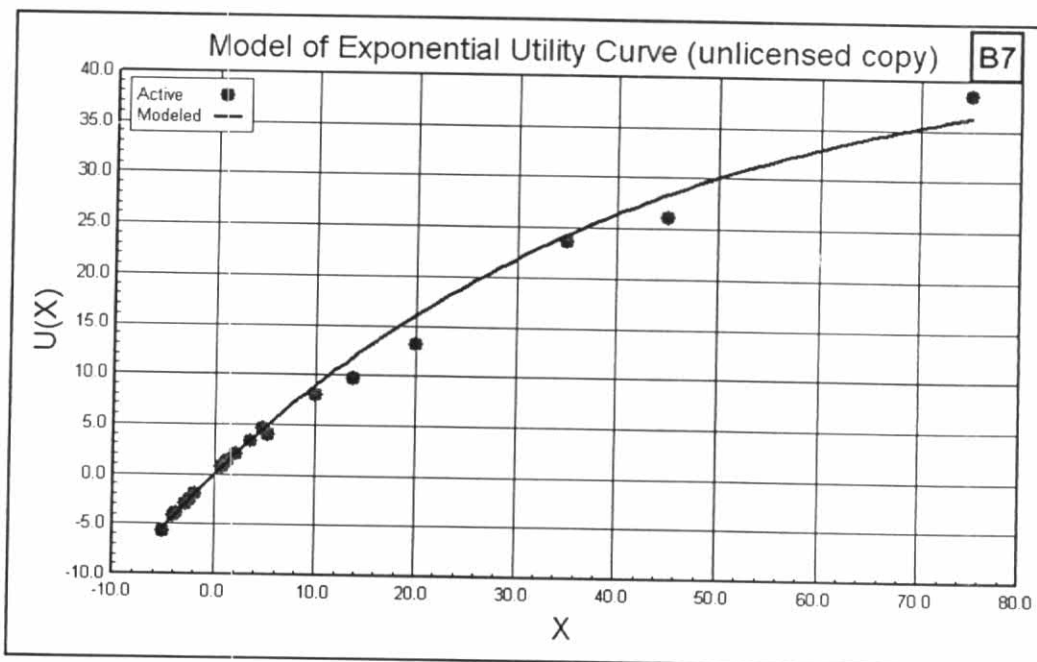| Prospect	B5. Analyst						
	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
1	70	0.15	0%			0.0000	
	-5	0.85					
2	22	0.25	0%			0.0000	
	-7.5	0.75					
3	35	0.50	0%			0.0000	
	-15	0.50					
4	15	0.20	0%			0.0000	
	-2.5	0.80					
5	45	0.20	0%			0.0000	
	-5	0.80					
6	55	0.50	50%	37.0	19.404	4.190	3.961
	-20	0.50			-11.482		
7	100	0.20	75%	115.0	55.0951	3.5851	3.5298
	-12	0.80			-9.3615		
8	20	0.40	0%			0.0000	
	-7.5	0.60					
9	90	0.25	75%	68.0	42.7996	4.9272	4.7530
	-10	0.75			-7.9292		
10	12.5	0.50	0%			0.0000	
	-2.5	0.50					
11	40	0.35	0%			0.0000	
	-11.5	0.65					
12	80	0.20	50%	65.0	29.8719	1.8424	1.8165
	-10	0.80			-5.1973		
RT	86.15						
CM	0.37						

Model of Exponential Utility Curve (unlicensed copy) — B5
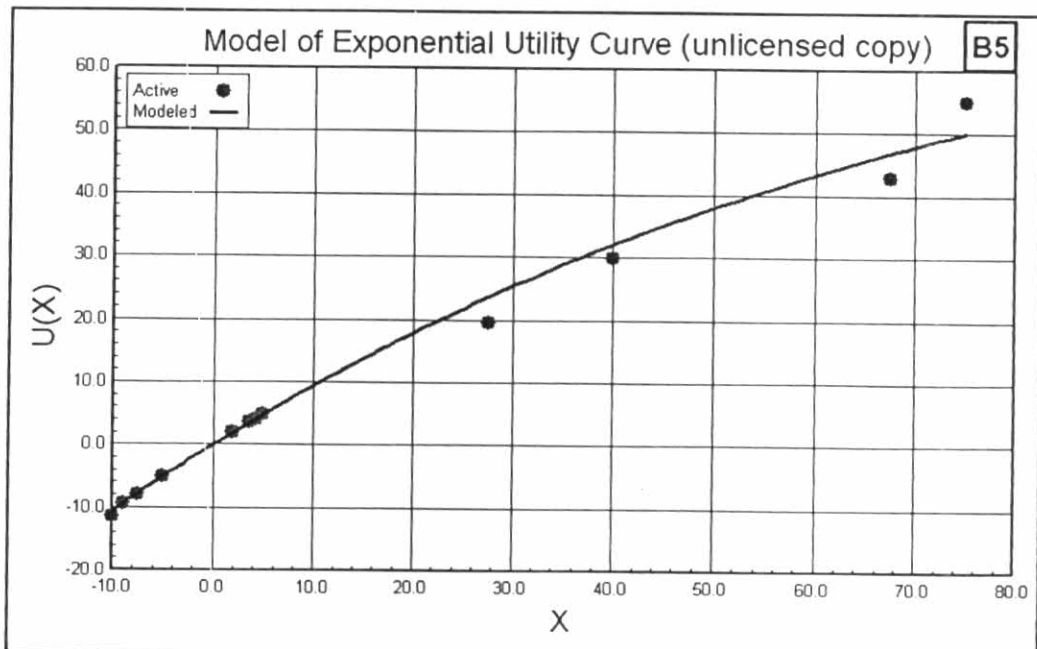
GROUP B: Replied Results and Preference Curve of B6.

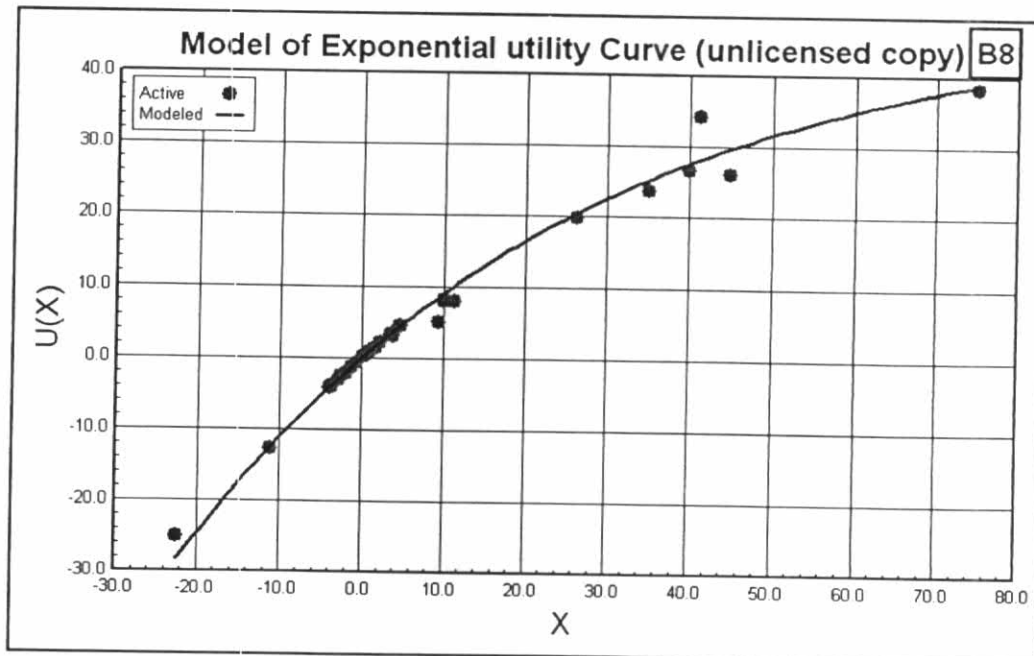| Prospect	B6. Coordinator Project						
	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
1	70	0.15	50%	41.5	23.6444	1.3790	1.3563
	-5	0.85			-2.5768		
2	22	0.25	0%			0.0000	
	-7.5	0.75					
3	35	0.50	0%			0.0000	
	-15	0.50					
4	15	0.20	0%			0.0000	
	-2.5	0.80					
5	45	0.20	75%	46.5	23.997	1.7060	1.675
	-5	0.80			-3.905		
6	55	0.50	25%	18.5	9.702	2.095	1.981
	-20	0.50			-5.741		
7	100	0.20	50%	60.0	33.9241	2.6721	2.6134
	-10	0.80			-5.2142		
8	20	0.40	0%			0.0000	
	-7.5	0.60					
9	90	0.25	75%	55.5	39.0526	5.2517	5.0109
	-8	0.75			-6.3363		
10	12.5	0.50	0%			0.0000	
	-2.5	0.50					
11	40	0.35	0%			0.0000	
	-11.5	0.65					
12	80	0.20	50%	45.0	26.4999	2.2256	2.1714
	-7.5	0.80			-3.9107		
RT				52.78			
CM				0.30			

Model of Exponential utyility Curve (unlicensed copy) B6
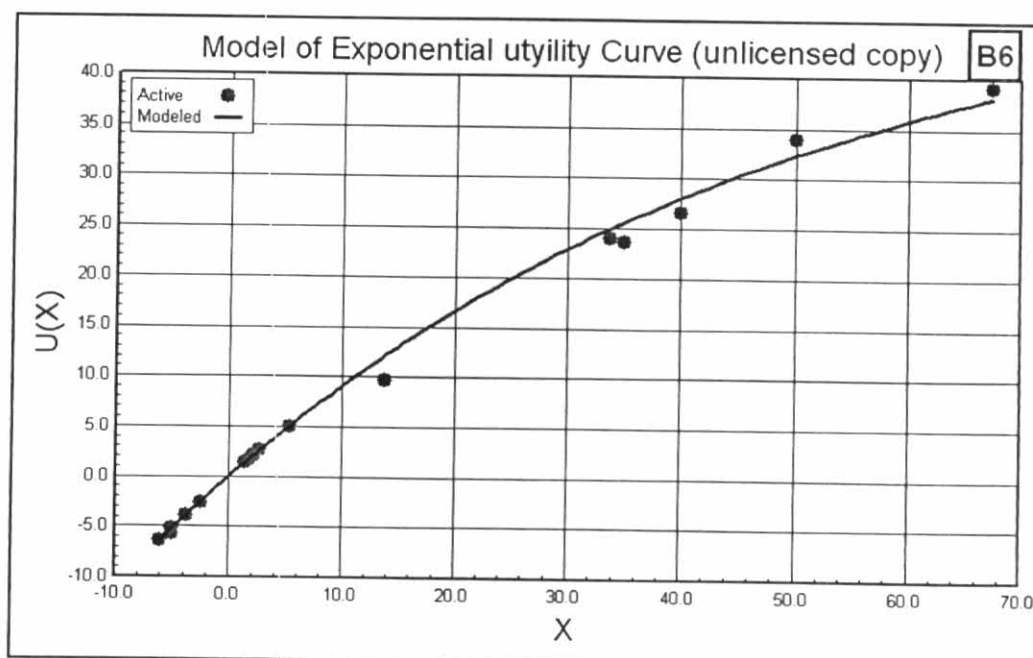
GROUP B: Replied Results and Preference Curve of B7.

Prospect	B7. Coordinator Project

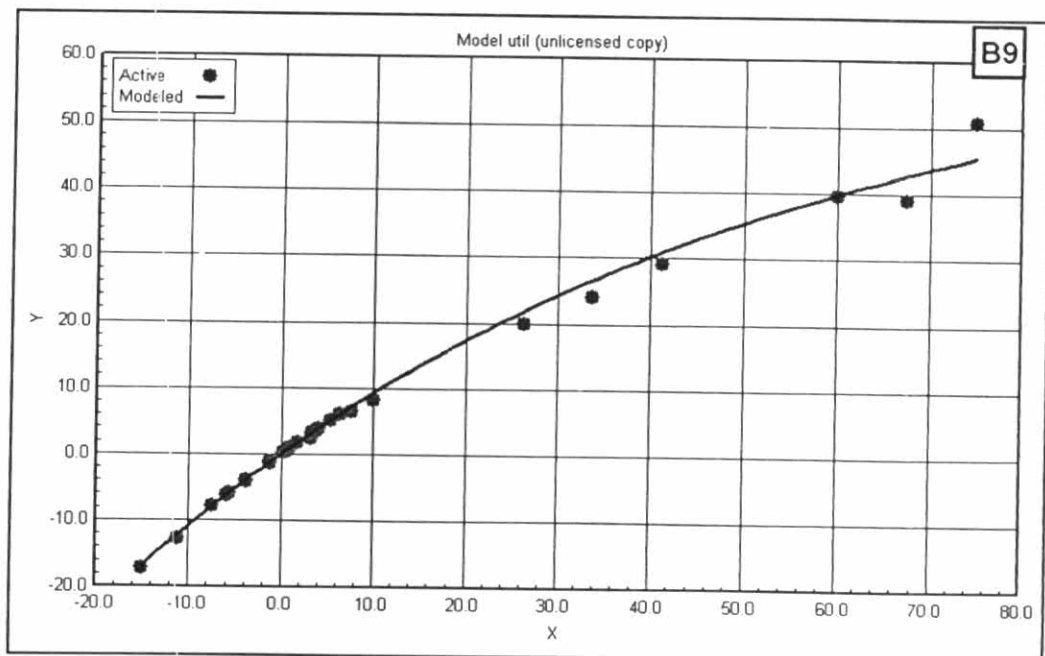| Prospect	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
1	70	0.15	50%	41.5	23.6444	1.3790	1.3563
	-5	0.85			-2.5768		
2	22	0.25	0%			0.0000	
	-7.5	0.75					
3	35	0.50	15%	9.0	3.9777	0.7404	0.7107
	-15	0.50			-2.5562		
4	15	0.20	0%			0.0000	
	-2.5	0.80					
5	45	0.20	0%			0.0000	
	-5	0.80					
6	55	0.50	25%	18.5	9.702	2.095	1.981
	-20	0.50			-5.741		
7	100	0.20	75%	49.0	38.3962	4.7880	4.5615
	-5	0.80			-3.8972		
8	20	0.40	0%			0.0000	
	-7.5	0.60					
9	90	0.25	50%	37.0	26.0351	3.5011	3.3406
	-8	0.75			-4.2242		
10	12.5	0.50	0%			0.0000	
	-2.5	0.50					
11	40	0.35	25%	20.5	7.9136	0.7782	0.7636
	-11.5	0.65			-3.0864		
12	80	0.20	25%	22.0	13.1364	1.0880	1.0615
	-7.5	0.80			-1.9572		
RT				44.55			
CM				0.57			

Model of Exponential Utility Curve (unlicensed copy) — B7

GROUP B: Replied Results and Preference Curve of B8.

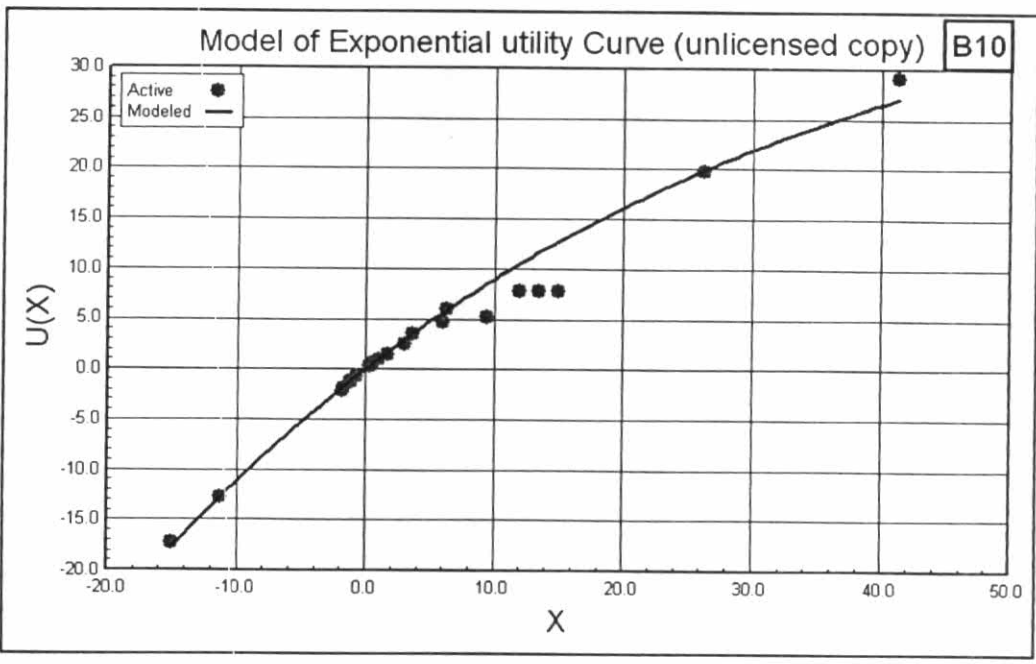| Prospect	B8. Coordinator Project						
	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
1	70	0.15	50%	41.5	23.6444	1.3790	1.3563
	-5	0.85			-2.5768		
2	22	0.25	50%	–			
	-7.5	0.75					
3	35	0.50	75%	44.5	19.8297	3.6615	3.5149
	-15	0.50			-12.7999		
4	15	0.20	25%	10.7	3.1634	0.1184	0.1178
	-2.5	0.80			-0.6436		
5	45	0.20	25%	15.5	7.999	0.5687	0.558
	-5	0.80			-1.302		
6	55	0.50	75%	105.0	34.112	4.609	4.510
	-30	0.50			-25.093		
7	100	0.20	75%	49.0	38.3962	4.7880	4.5615
	-5	0.80			-3.8972		
8	20	0.40	50%	24.0	8.1782	0.8509	0.8360
	-7.5	0.60			-4.0588		
9	90	0.25	50%	37.0	26.0351	3.5011	3.3406
	-8	0.75			-4.2242		
10	12.5	0.50	75%	7.0	5.1658	1.6981	1.5078
	-2.5	0.50			-2.1501		
11	40	0.35	25%	20.5	7.9136	0.7782	0.7636
	-11.5	0.65			-3.0864		
12	80	0.20	50%	45.0	26.4999	2.2256	2.1714
	-7.5	0.80			-3.9107		
RT				50.00			
CM				0.59			

Model of Exponential utility Curve (unlicensed copy) B8

GROUP B: Replied Results and Preference Curve of B9.

| Prospect	B9. Coordinator Project						
	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
1	70	0.15	0%			0.0000	
	-5	0.85					
2	22	0.25	50%	–			
	-7.5	0.75					
3	35	0.50	75%	44.5	19.8297	3.6615	3.5149
	-15	0.50			-12.7999		
4	15	0.20	50%	21.5	6.3316	0.2380	0.2367
	-2.5	0.80			-1.2871		
5	45	0.20	75%	46.5	23.997	1.7060	1.675
	-5	0.80			-3.905		
6	55	0.50	75%	55.5	29.106	6.284	5.942
	-20	0.50			-17.223		
7	100	0.20	75%	90.0	50.8862	4.0081	3.9201
	-10	0.80			-7.8214		
8	20	0.40	50%	24.0	8.1782	0.8509	0.8360
	-7.5	0.60			-4.0588		
9	90	0.25	75%	55.5	39.0526	5.2517	5.0109
	-8	0.75			-6.3363		
10	12.5	0.50	25%	4.8	2.2968	0.4554	0.4345
	-5	0.50			-1.4279		
11	40	0.35	0%			0.0000	
	-11.5	0.65					
12	80	0.20	75%	67.0	39.6376	3.3138	3.2332
	-7.5	0.80			-5.8679		
RT				68.04			
CM				0.49			

Model util (unlicensed copy) — B9

GROUP B: Replied Results and Preference Curve of B10.

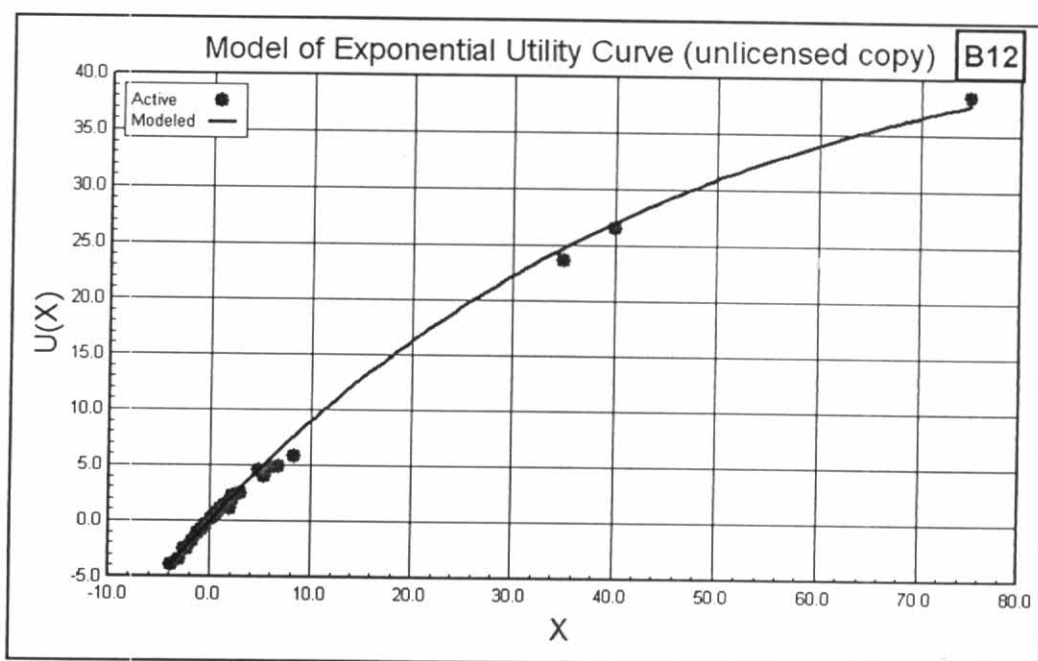| Prospect	B10. Engineer						
	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
1	70 -5	0.15 0.85	0%			0.0000	
2	22 -7.5	0.25 0.75	0%	–	–	–	–
3	35 -15	0.50 0.50	75%	44.5	19.8297 -12.7999	3.6615	3.5149
4	15 -2.5	0.20 0.80	0%			0.0000	
5	45 -5	0.20 0.80	0%			0.0000	
6	55 -20	0.50 0.50	75%	55.5	29.106 -17.223	6.284	5.942
7	100 -5	0.20 0.80	15%	10.0	7.7687 -0.7788	0.9769	0.9307
8	20 -7.5	0.40 0.60	15%	7.0	2.4399 -1.2204	0.2480	0.2437
9	90 -8	0.25 0.75	15%	11.0	7.7760 -1.2679	1.0408	0.9931
10	12.5 -2.5	0.50 0.50	75%	7.0	5.1658 -2.1501	1.6981	1.5078
11	40 -11.5	0.35 0.65	15%	12.0	4.7216 -1.8551	0.4553	0.4467
12	80 -7.5	0.20 0.80	15%	13.0	7.8352 -1.1751	0.6426	0.6269
RT	45.08						
CM	0.68						

Model of Exponential utility Curve (unlicensed copy) B10

GROUP B: Replied Results and Preference Curve of B11.

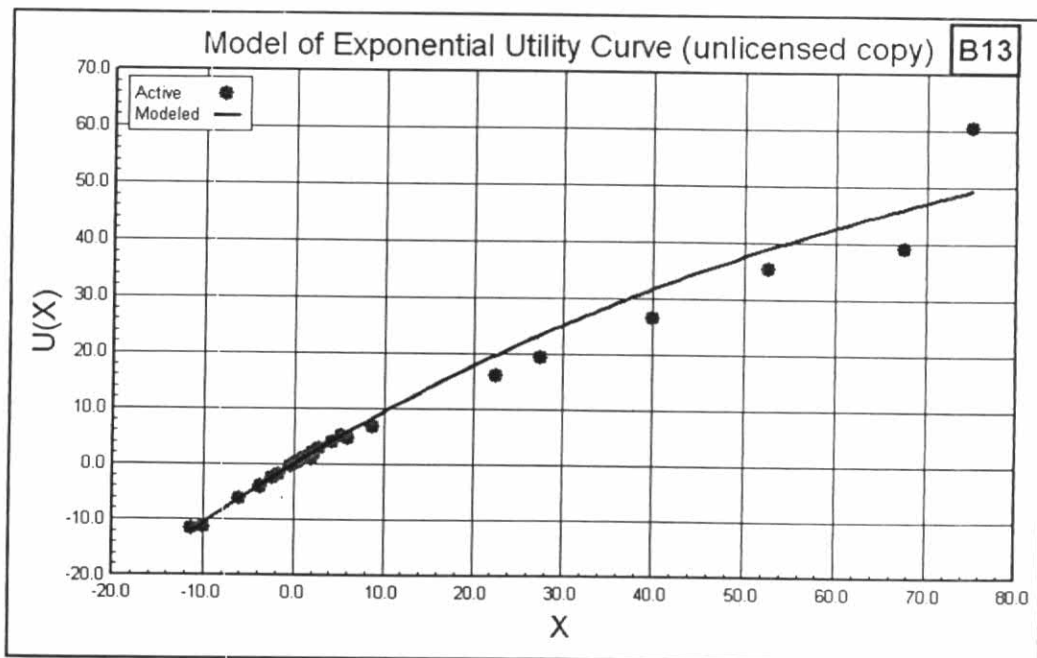| Prospect	B11. Engineer						
	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
1	70	0.15	75%	62.0	35.4147	2.0602	2.0263
	-5	0.85			-3.8657		
2	22	0.25	25%	–	–	–	–
	-7.5	0.75					
3	35	0.50	15%	9.0	3.9777	0.7404	0.7107
	-15	0.50			-2.5562		
4	15	0.20	25%	10.7	3.1634	0.1184	0.1178
	-2.5	0.80			-0.6436		
5	45	0.20	50%	31.0	15.998	1.1374	1.117
	-5	0.80			-2.604		
6	55	0.50	15%	11.0	5.804	1.245	1.178
	-20	0.50			-3.449		
7	100	0.20	75%	49.0	38.3962	4.7880	4.5615
	-5	0.80			-3.8972		
8	20	0.40	15%	7.0	2.4399	0.2480	0.2437
	-7.5	0.60			-1.2204		
9	90	0.25	75%	55.5	39.0526	5.2517	5.0109
	-8	0.75			-6.5363		
10	12.5	0.50	25%	2.3	1.7089	0.5579	0.4954
	-2.5	0.50			-0.7182		
11	40	0.35	25%	20.5	7.9136	0.7782	0.7636
	-11.5	0.65			-3.0864		
12	80	0.20	25%	22.0	13.1364	1.0880	1.0615
	-7.5	0.80			-1.9572		
RT				52.34			
CM				0.64			

Model of Exponential Utility Curve (unlicensed copy) B11
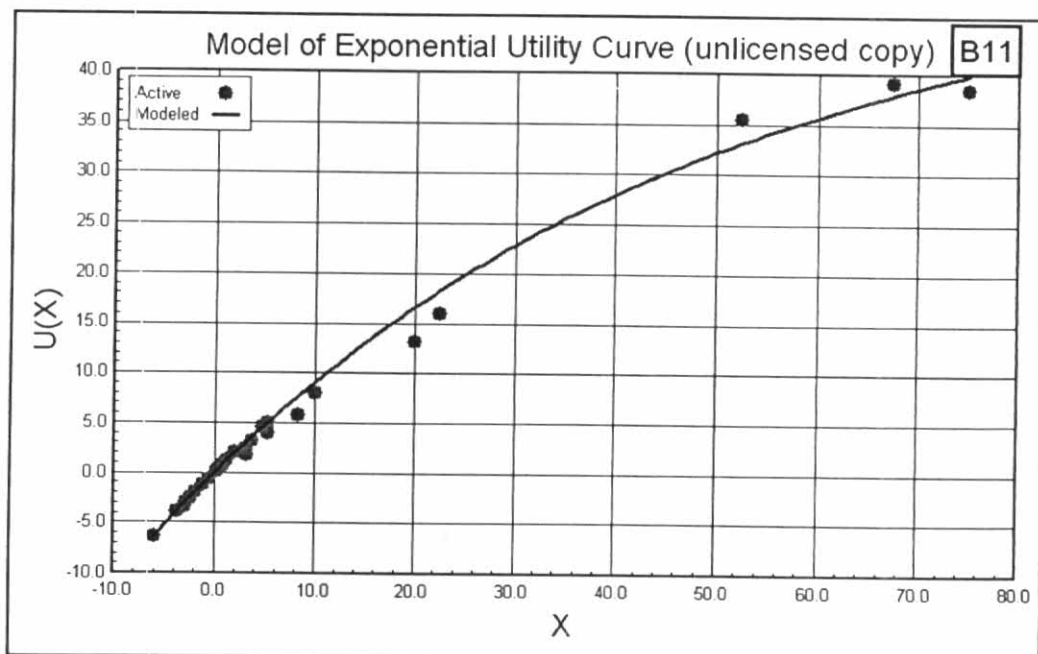
GROUP B: Replied Results and Preference Curve of B12.

Prospect	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
				B12. Engineer			
1	70	0.15	50%	41.5	23.6444	1.3790	1.3563
	-5	0.85			-2.5768		
2	22	0.25	15%	–	–	–	–
	-7.5	0.75					
3	35	0.50	15%	9.0	3.9777	0.7404	0.7107
	-15	0.50			-2.5562		
4	15	0.20	15%	6.5	1.9019	0.0719	0.0716
	-2.5	0.80			-0.3860		
5	45	0.20	15%	9.5	4.832	0.3484	0.342
	-5	0.80			-0.780		
6	55	0.50	15%	11.0	5.804	1.245	1.178
	-20	0.50			-3.449		
7	100	0.20	75%	49.0	38.3962	4.7880	4.5615
	-5	0.80			-3.8972		
8	20	0.40	15%	7.0	2.4399	0.2480	0.2437
	-7.5	0.60			-1.2204		
9	90	0.25	15%	11.0	7.7760	1.0408	0.9931
	-8	0.75			-1.2679		
10	12.5	0.50	15%	1.4	1.0332	0.3396	0.3016
	-2.5	0.50			-0.4300		
11	40	0.35	15%	12.0	4.7216	0.4553	0.4467
	-11.5	0.65			-1.8551		
12	80	0.20	50%	45.0	26.4999	2.2256	2.1714
	-7.5	0.80			-3.9107		
RT				47.40			
CM				0.70			

Model of Exponential Utility Curve (unlicensed copy) B12

GROUP B: Replied Results and Preference Curve of B13.

Prospect	B13. Engineer						
	x_i	p_i	WI	RT	$U(x_i)$	CE	EU
1	70 -5	0.15 0.85	75%	62.0	35.4147 -3.8657	2.0602	2.0263
2	22 -7.5	0.25 0.75	25%	–	–	–	–
3	35 -15	0.50 0.50	25%	15.0	6.6295 -4.2604	1.2339	1.1845
4	15 -2.5	0.20 0.80	15%	6.5	1.9019 -0.3860	0.0719	0.0716
5	45 -5	0.20 0.80	50%	31.0	15.998 -2.604	1.1374	1.117
6	55 -20	0.50 0.50	50%	37.0	19.404 -11.482	4.190	3.961
7	100 -15	0.20 0.80	75%	168.0	60.4952 -11.6352	2.8143	2.7909
8	20 -7.5	0.40 0.60	0%			0.0000	
9	90 -8	0.25 0.75	75%	55.5	39.0526 -6.3363	5.2517	5.0109
10	12.5 -2.5	0.50 0.50	15%	1.4	1.0332 -0.4300	0.3396	0.3016
11	40 -11.5	0.35 0.65	15%	12.0	4.7216 -1.8551	0.4553	0.4467
12	80 -7.5	0.20 0.80	50%	45.0	26.4999 -3.9107	2.2256	2.1714
RT				82.39			
CM				0.73			

Model of Exponential Utility Curve (unlicensed copy) B13

VITAE

Daojai Yudee was born on January 19, 1980 in Rayong, Thailand. She received her B.Sc in Chemistry from King Mongkut's University of Technology Thonburi in 2002. After that she continued her Master Degree in Petroleum Engineering Program at the Department of Mining and Petroleum Engineering, Faculty of Engineering, Chulalongkorn University in 2004.