

Appendix P

**Results of the application of the decision support model
assuming that the withdrawal and demand patterns exhibit
the same seasonal cycle**

Explanatory notes

The decision support model uses the same cycle to forecast demand and withdrawal patterns combined with the order policy which provided the “best” results in Chapter 6. The results of the calculations are shown in Appendices P1, P2, P3 and P4 for the four differing cycles, whereas Appendices P1-5, P2-10, P3-4 and P4-7 compare the daily cost of those approaches that comply with the suitability criteria discussed in Chapter 7.



Appendix P1-1						
Seasonality based on a six day cycle						
Withdrawals forecast using moving averages and simple seasonal relatives						
Deposits forecast using moving averages and simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	218 228	2 398	17	0	0
400 000	750 000	218 228	2 398	17	0	0
500 000	750 000	219 502	2 412	17	0	0
600 000	750 000	224 598	2 468	17	0	0
700 000	750 000	225 872	2 482	17	0	0
800 000	750 000	233 198	2 563	17	0	0
900 000	750 000	242 013	2 659	18	0	0
1 000 000	750 000	244 243	2 684	18	0	0

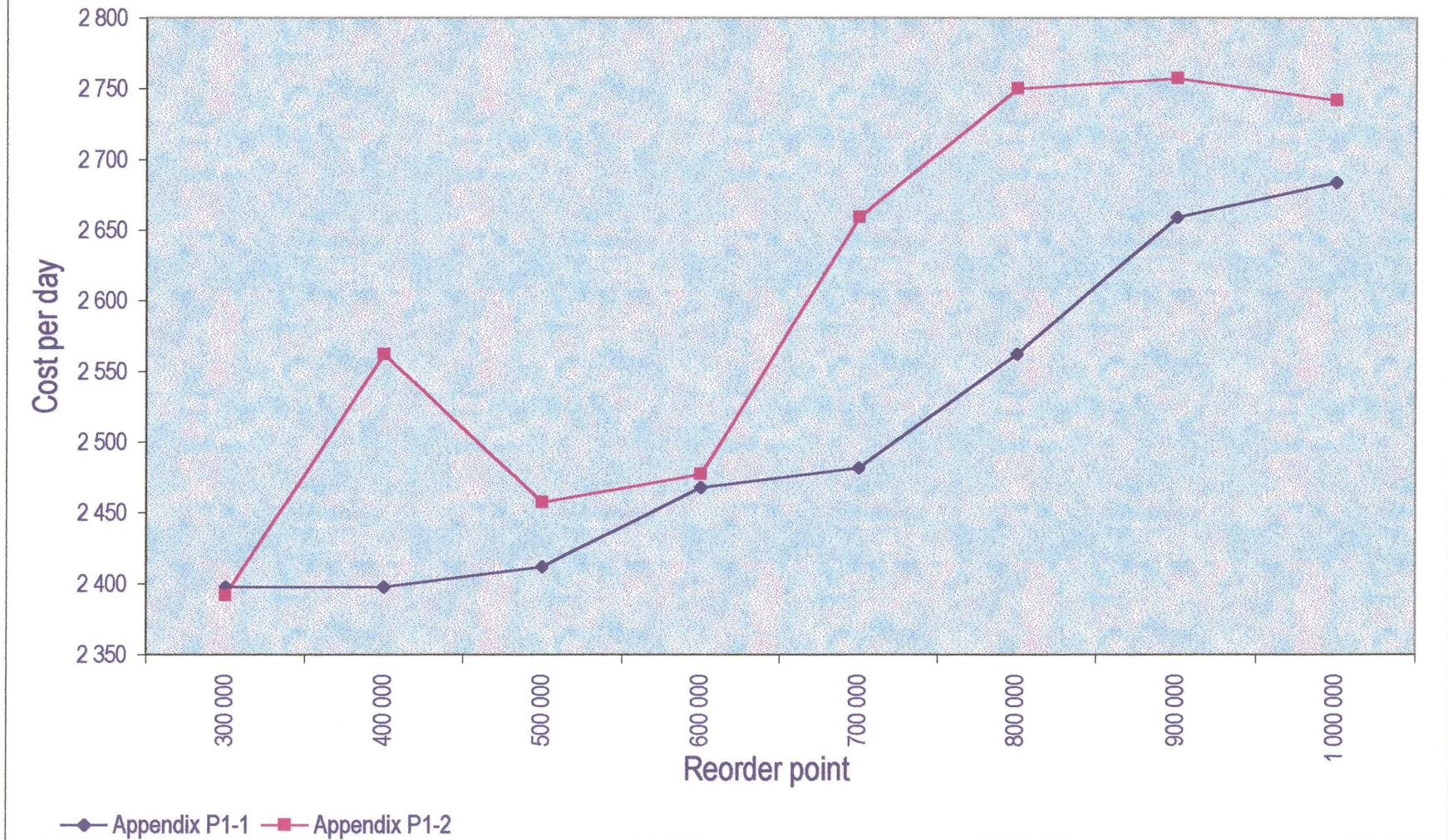
Appendix P1-2						
Seasonality based on a six day cycle						
Withdrawals forecast using moving averages and simple seasonal relatives						
Deposits forecast using Winter's method with a regressed trend & simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	217 667	2 392	16	1	0
400 000	750 000	233 171	2 562	17	1	0
500 000	750 000	223 643	2 458	17	0	0
600 000	750 000	225 452	2 477	18	0	0
700 000	750 000	242 013	2 659	18	0	0
800 000	750 000	250 294	2 750	18	0	0
900 000	750 000	250 931	2 757	18	0	0
1 000 000	750 000	249 555	2 742	19	0	0



Appendix P1-3						
Seasonality based on a six day cycle						
Withdrawals forecast using Winter's method with a regressed trend & simple seasonal relatives						
Deposits forecast using moving averages and simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	223 182	2 453	15	2	2
400 000	750 000	223 713	2 458	15	2	2
500 000	750 000	229 852	2 526	16	0	1
600 000	750 000	231 763	2 547	16	0	1
700 000	750 000	236 559	2 600	15	2	2
800 000	750 000	234 948	2 582	16	0	1
900 000	750 000	244 503	2 687	16	0	1
1 000 000	750 000	247 369	2 718	16	0	1

Appendix P1-4						
Seasonality based on a six day cycle						
Withdrawals forecast using Winter's method with a regressed trend & simple seasonal relatives						
Deposits forecast using Winter's method with a regressed trend & simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	216 287	2 377	16	1	0
400 000	750 000	222 227	2 442	15	2	2
500 000	750 000	222 227	2 442	15	2	2
600 000	750 000	225 235	2 475	17	0	0
700 000	750 000	231 126	2 540	16	0	1
800 000	750 000	238 293	2 619	17	0	0
900 000	750 000	241 478	2 654	17	0	0
1 000 000	750 000	242 332	2 663	18	0	0

Appendix P1-5: Forecasting based on a six day cycle





Appendix P2-1						
Seasonality based on a 24 day cycle						
Withdrawals forecast using FIT smoothing with a default trend & simple seasonal relatives						
Deposits forecast using simple exponential smoothing & moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	219 754	2 415	14	3	2
400 000	750 000	225 629	2 479	16	1	0
500 000	750 000	221 413	2 433	17	0	0
600 000	750 000	228 739	2 514	17	0	0
700 000	750 000	236 064	2 594	17	0	0
800 000	750 000	241 318	2 652	16	0	1
900 000	750 000	241 160	2 650	17	0	0
1 000 000	750 000	246 893	2 713	17	0	0

Appendix P2-2						
Seasonality based on a 24 day cycle						
Withdrawals forecast using FIT smoothing with a default trend & simple seasonal relatives						
Deposits forecast using FIT smoothing with a regressed trend & moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	217 267	2 388	15	2	1
400 000	750 000	224 886	2 471	16	1	0
500 000	750 000	222 444	2 444	16	1	0
600 000	750 000	224 917	2 472	17	0	0
700 000	750 000	236 064	2 594	17	0	0
800 000	750 000	237 656	2 612	17	0	0
900 000	750 000	241 160	2 650	17	0	0
1 000 000	750 000	241 160	2 650	17	0	0

Appendix P2-3						
Seasonality based on a 24 day cycle						
Withdrawals forecast using FIT smoothing with a default trend & simple seasonal relatives						
Deposits forecast using simple averages & simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	219 921	2 417	15	2	1
400 000	750 000	220 215	2 420	16	1	0
500 000	750 000	224 598	2 468	17	0	0
600 000	750 000	226 509	2 489	17	0	0
700 000	750 000	228 578	2 512	16	0	1
800 000	750 000	233 835	2 570	17	0	0
900 000	750 000	242 013	2 659	18	0	0
1 000 000	750 000	241 695	2 656	18	0	0



Appendix P2-4						
Seasonality based on a 24 day cycle						
Withdrawals forecast using simple averages and simple seasonal relatives						
Deposits forecast using simple exponential smoothing using moving seasonal relatives						
ROP	Q = 750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	215 838	2 372	16	0	1
400 000	750 000	230 013	2 528	17	0	0
500 000	750 000	227 146	2 496	17	0	0
600 000	750 000	235 427	2 587	17	0	0
700 000	750 000	237 496	2 610	16	0	1
800 000	750 000	243 229	2 673	16	0	1
900 000	750 000	244 663	2 689	17	0	0
1 000 000	750 000	246 893	2 713	17	0	0

Appendix P2-5						
Seasonality based on a 24 day cycle						
Withdrawals forecast using simple averages and simple seasonal relatives						
Deposits forecast using FIT smoothing with a regressed trend & moving seasonal relatives						
ROP	Q = 750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	215 838	2 372	16	0	1
400 000	750 000	229 133	2 518	16	1	0
500 000	750 000	227 146	2 496	17	0	0
600 000	750 000	235 427	2 587	17	0	0
700 000	750 000	236 859	2 603	16	0	1
800 000	750 000	241 636	2 655	16	0	1
900 000	750 000	244 184	2 683	16	0	1
1 000 000	750 000	246 893	2 713	17	0	0

Appendix P2-6						
Seasonality based on a 24 day cycle						
Withdrawals forecast using simple averages and simple seasonal relatives						
Deposits forecast using simple exponential smoothing using moving seasonal relatives						
ROP	Q = 750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	220 616	2 424	16	0	1
400 000	750 000	220 776	2 426	17	0	0
500 000	750 000	226 509	2 489	17	0	0
600 000	750 000	229 057	2 517	17	0	0
700 000	750 000	230 968	2 538	17	0	0
800 000	750 000	238 451	2 620	16	0	1
900 000	750 000	240 841	2 647	17	0	0
1 000 000	750 000	246 574	2 710	17	0	0

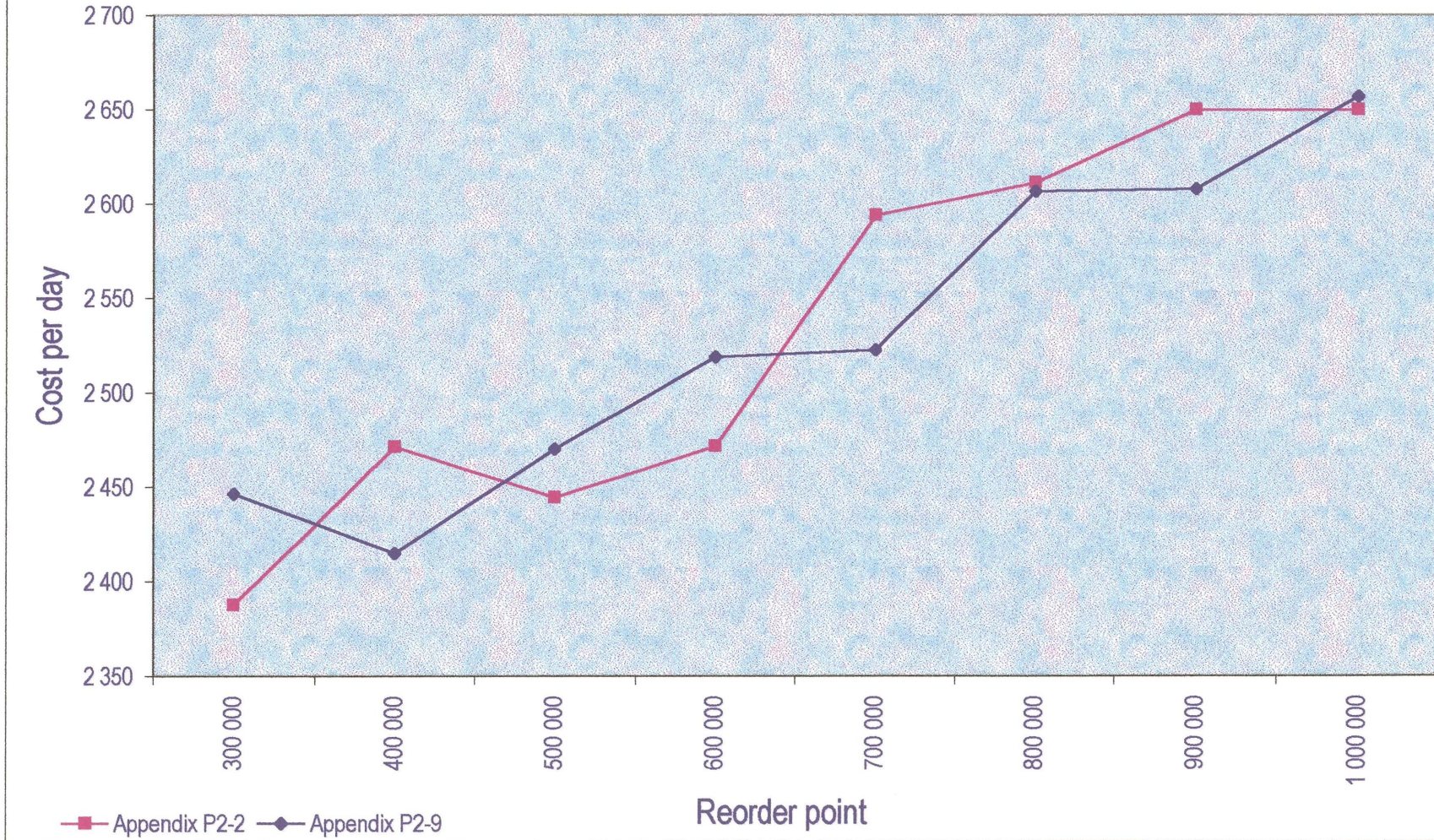


Appendix P2-7						
Seasonality based on a 24 day cycle						
Withdrawals forecast using simple averages moving seasonal relatives						
Deposits forecast using simple exponential smoothing using moving seasonal relatives						
300 000	750 000	222 232	2 442	16	1	0
400 000	750 000	226 691	2 491	16	1	0
500 000	750 000	229 533	2 522	16	0	1
600 000	750 000	236 701	2 601	17	0	0
700 000	750 000	236 540	2 599	16	0	1
800 000	750 000	241 797	2 657	17	0	0
900 000	750 000	247 109	2 715	18	0	0
1 000 000	750 000	247 428	2 719	18	0	0

Appendix P2-8						
Seasonality based on a 24 day cycle						
Withdrawals forecast using simple averages moving seasonal relatives						
Deposits forecast using FIT smoothing with a regressed trend & moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	220 321	2 421	16	1	0
400 000	750 000	226 054	2 484	16	1	0
500 000	750 000	227 941	2 505	16	0	1
600 000	750 000	235 109	2 584	17	0	0
700 000	750 000	237 656	2 612	17	0	0
800 000	750 000	240 681	2 645	16	0	1
900 000	750 000	247 109	2 715	18	0	0
1 000 000	750 000	246 893	2 713	17	0	0

Appendix P2-9						
Seasonality based on a 24 day cycle						
Withdrawals forecast using simple averages moving seasonal relatives						
Deposits forecast using simple exponential smoothing using moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	222 627	2 446	16	1	1
400 000	750 000	219 760	2 415	16	1	1
500 000	750 000	224 780	2 470	16	1	0
600 000	750 000	229 239	2 519	16	1	0
700 000	750 000	229 557	2 523	16	1	0
800 000	750 000	237 236	2 607	18	0	0
900 000	750 000	237 338	2 608	17	0	0
1 000 000	750 000	241 797	2 657	17	0	0

Appendix P-2-10: Forecasting based on a 24 day cycle



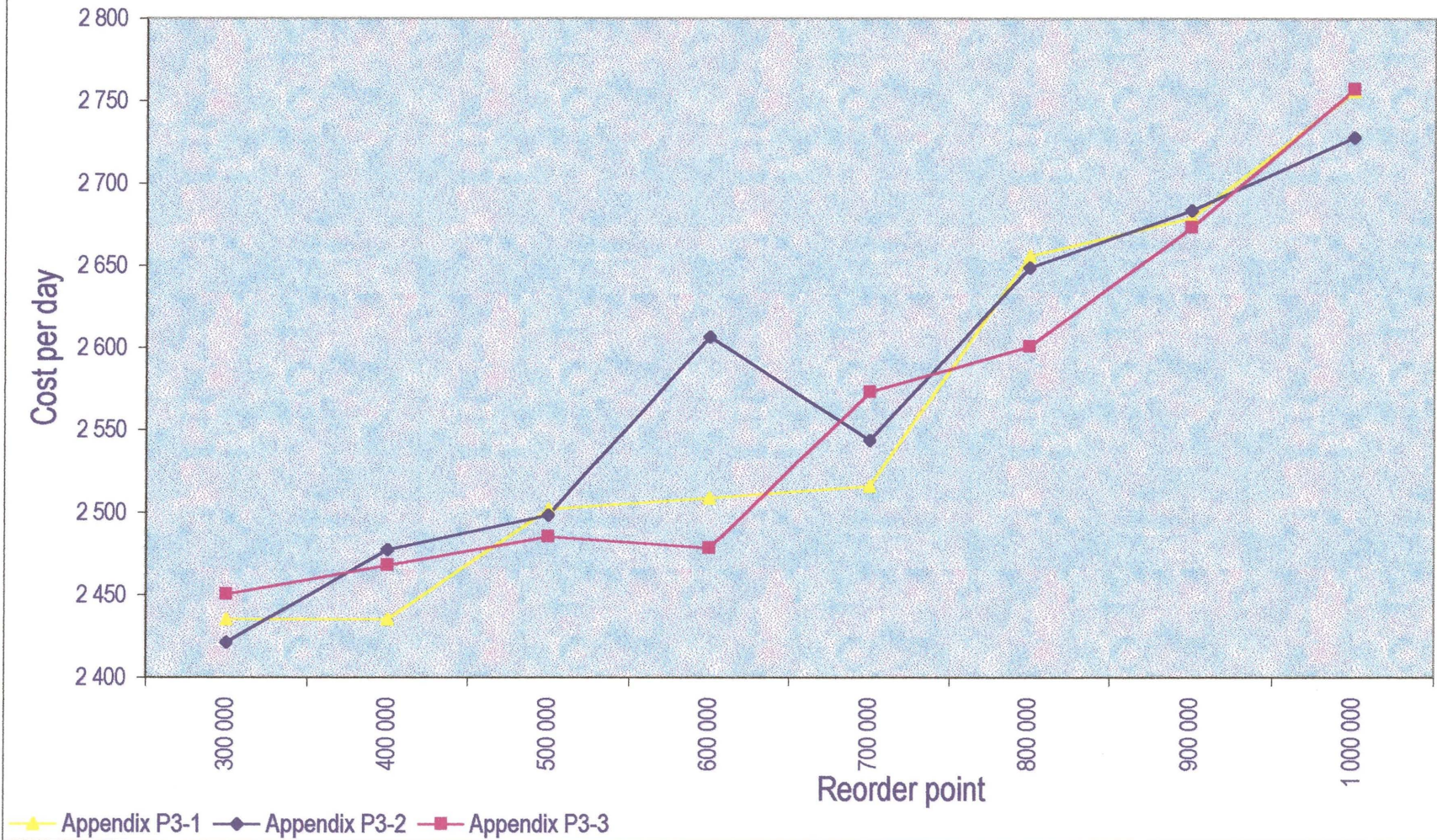


Appendix P3-1						
Seasonality based on a 26 day cycle						
Withdrawals forecast using simple averages and simple seasonal relatives						
Deposits forecast using simple averages and simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	221 630	2 435	18	0	0
400 000	750 000	221 630	2 435	18	0	0
500 000	750 000	227 681	2 502	18	0	0
600 000	750 000	228 318	2 509	18	0	0
700 000	750 000	228 955	2 516	18	0	0
800 000	750 000	241 695	2 656	18	0	0
900 000	750 000	243 822	2 679	19	0	0
1 000 000	750 000	250 829	2 756	19	0	0

Appendix P3-2						
Seasonality based on a 26 day cycle						
Withdrawals forecast using moving averages and simple seasonal relatives						
Deposits forecast using Winter's method with a regressed trend & simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	220 356	2 421	18	0	0
400 000	750 000	225 452	2 477	18	0	0
500 000	750 000	227 363	2 498	18	0	0
600 000	750 000	237 236	2 607	18	0	0
700 000	750 000	231 503	2 544	18	0	0
800 000	750 000	241 058	2 649	18	0	0
900 000	750 000	244 243	2 684	18	0	0
1 000 000	750 000	248 281	2 728	19	0	0

Appendix P3-3						
Seasonality based on a six day cycle						
Withdrawals forecast using moving averages and simple seasonal relatives						
Deposits forecast using Winter's method with a regressed trend & moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	223 006	2 451	17	0	0
400 000	750 000	224 598	2 468	17	0	0
500 000	750 000	226 191	2 486	17	0	0
600 000	750 000	225 554	2 479	17	0	0
700 000	750 000	234 153	2 573	17	0	0
800 000	750 000	236 701	2 601	17	0	0
900 000	750 000	243 287	2 673	18	0	0
1 000 000	750 000	250 931	2 757	18	0	0

Appendix P-3-4: Forecasting using a 26 day cycle





Appendix P4-1						
Seasonality based on a 30 day cycle						
Withdrawals forecast using FIT smoothing with a default trend and simple seasonal relatives						
Deposits forecast using simple exponential smoothing and simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	215 756	2 371	16	1	0
400 000	750 000	219 502	2 412	17	0	0
500 000	750 000	223 006	2 451	17	0	0
600 000	750 000	233 198	2 563	17	0	0
700 000	750 000	237 873	2 614	18	0	0
800 000	750 000	234 370	2 575	18	0	0
900 000	750 000	242 650	2 666	18	0	0
1 000 000	750 000	246 472	2 708	18	0	0

Appendix P4-2						
Seasonality based on a 30 day cycle						
Withdrawals forecast using moving averages and simple seasonal relatives						
Deposits forecast using Winter's method with a regressed trend & simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	217 685	2 392	17	1	1
400 000	750 000	220 260	2 420	17	0	1
500 000	750 000	223 404	2 455	17	1	0
600 000	750 000	234 870	2 581	17	1	0
700 000	750 000	233 733	2 568	18	0	0
800 000	750 000	233 733	2 568	18	0	0
900 000	750 000	247 007	2 714	19	0	0
1 000 000	750 000	243 822	2 679	19	0	0

Appendix P4-3						
Seasonality based on a 30 day cycle						
Withdrawals forecast using moving averages and simple seasonal relatives						
Deposits forecast using Winter's method with a regressed trend & moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	215 756	2 371	16	1	0
400 000	750 000	219 502	2 412	17	0	0
500 000	750 000	227 863	2 504	17	1	0
600 000	750 000	226 509	2 489	17	0	0
700 000	750 000	234 370	2 575	18	0	0
800 000	750 000	236 599	2 600	18	0	0
900 000	750 000	241 695	2 656	18	0	0
1 000 000	750 000	242 013	2 659	18	0	0

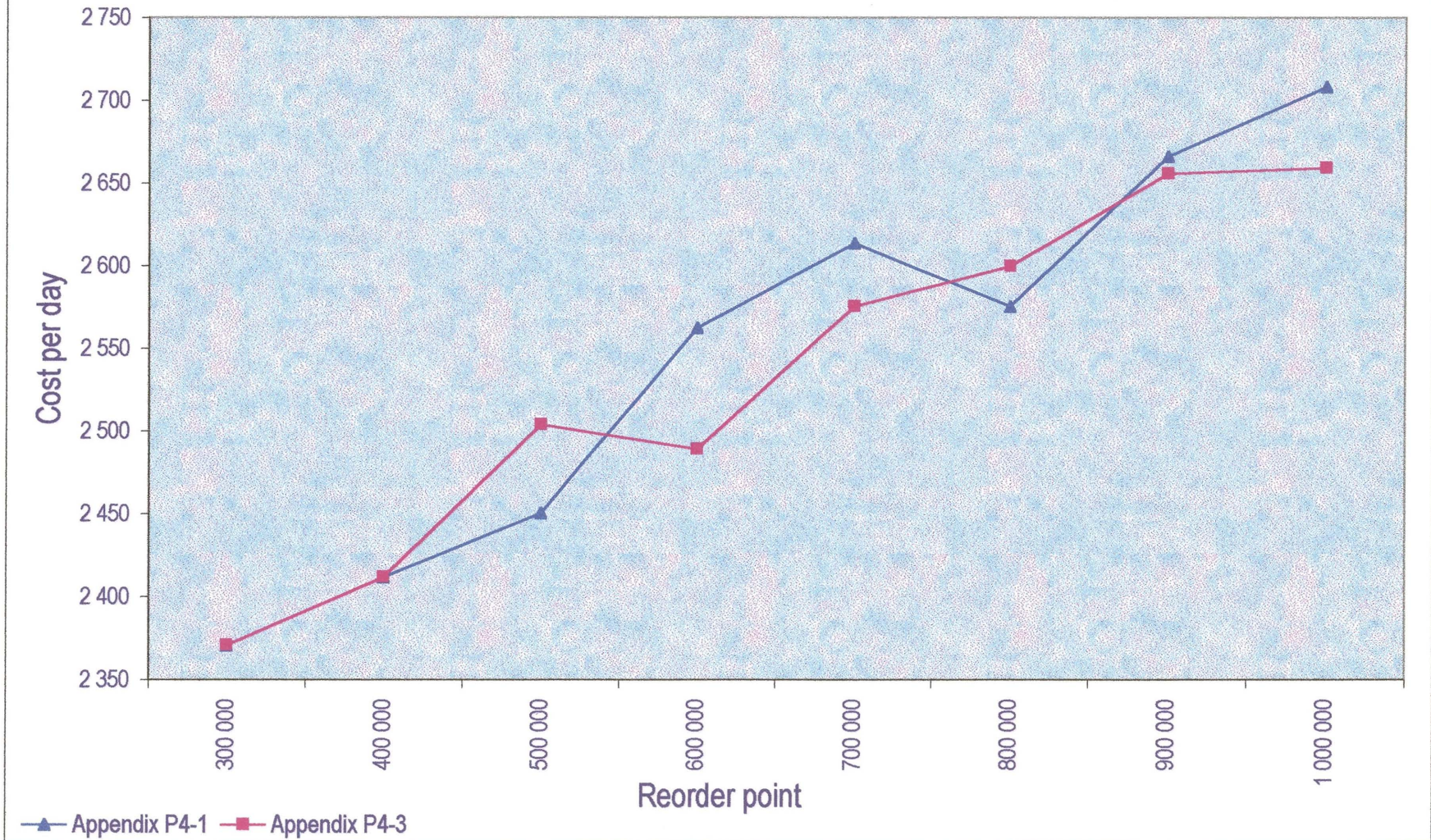


Appendix P4-4						
Seasonality based on a 30 day cycle						
Withdrawals forecast using FIT smoothing with a default trend and simple seasonal relatives						
Deposits forecast using simple exponential smoothing and simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	225 093	2 474	15	2	2
400 000	750 000	220 458	2 423	17	0	0
500 000	750 000	223 400	2 455	16	1	0
600 000	750 000	233 910	2 570	16	1	0
700 000	750 000	233 591	2 567	16	1	0
800 000	750 000	242 191	2 661	16	1	0
900 000	750 000	244 026	2 682	17	0	0
1 000 000	750 000	243 924	2 680	18	0	0

Appendix P4-5						
Seasonality based on a 30 day cycle						
Withdrawals forecast using moving averages and simple seasonal relatives						
Deposits forecast using Winter's method with a regressed trend & simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	221 271	2 432	15	2	2
400 000	750 000	227 757	2 503	17	1	0
500 000	750 000	234 092	2 572	16	1	1
600 000	750 000	223 324	2 454	17	0	0
700 000	750 000	238 612	2 622	17	0	0
800 000	750 000	240 523	2 643	17	0	0
900 000	750 000	241 695	2 656	18	0	0
1 000 000	750 000	242 969	2 670	18	0	0

Appendix P4-6						
Seasonality based on a 30 day cycle						
Withdrawals forecast using moving averages and simple seasonal relatives						
Deposits forecast using Winter's method with a regressed trend & moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	216 706	2 381	15	2	2
400 000	750 000	225 417	2 477	16	1	0
500 000	750 000	222 050	2 440	17	0	0
600 000	750 000	233 198	2 563	17	0	0
700 000	750 000	233 198	2 563	17	0	0
800 000	750 000	240 917	2 647	16	1	0
900 000	750 000	240 523	2 643	17	0	0
1 000 000	750 000	245 198	2 694	18	0	0

Appendix P-4-7: Forecasting using a 30 day cycle





Appendix Q

Results of the application of the decision support model

based on the minimisation of forecast error

Explanatory notes

The decision support model uses the methods suggested by the minimisation of three different measures of forecast error. The results of the calculations are shown in Appendices Q1 and Q4.



Appendix Q1-1						
Seasonality of deposits based on a 24 day cycle & withdrawals on 26 day cycle						
Withdrawals forecast using simple averages & simple seasonal relatives						
Deposits forecast using simple exponential smoothing & moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	225 452	2 477	18	0	0
400 000	750 000	227 681	2 502	18	0	0
500 000	750 000	229 911	2 526	18	0	0
600 000	750 000	229 911	2 526	18	0	0
700 000	750 000	236 781	2 602	17	1	0
800 000	750 000	240 102	2 638	18	0	0
900 000	750 000	245 517	2 698	18	0	0
1 000 000	750 000	247 746	2 722	18	0	0

Appendix Q1-2						
Seasonality of deposits based on a 24 day cycle & withdrawals on 26 day cycle						
Withdrawals forecast using simple averages & simple seasonal relatives						
Deposits forecast using simple averages & simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	220 993	2 428	18	0	0
400 000	750 000	222 267	2 442	18	0	0
500 000	750 000	223 541	2 456	18	0	0
600 000	750 000	226 089	2 484	18	0	0
700 000	750 000	232 777	2 558	18	0	0
800 000	750 000	240 739	2 645	18	0	0
900 000	750 000	244 459	2 686	19	0	0
1 000 000	750 000	248 600	2 732	19	0	0

Appendix Q1-3						
Seasonality of deposits based on a 24 day cycle & withdrawals on 26 day cycle						
Withdrawals forecast using simple averages & simple seasonal relatives						
Deposits forecast using FIT smoothing with a regressed trend & moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	221 918	2 439	17	1	0
400 000	750 000	227 681	2 502	18	0	0
500 000	750 000	227 681	2 502	18	0	0
600 000	750 000	229 911	2 526	18	0	0
700 000	750 000	234 370	2 575	18	0	0
800 000	750 000	239 784	2 635	18	0	0
900 000	750 000	246 791	2 712	18	0	0
1 000 000	750 000	246 154	2 705	18	0	0



Appendix Q2-1						
Seasonality of deposits based on a 24 day cycle & withdrawals on 30 day cycle						
Withdrawals forecast using FIT smoothing with a default trend & simple seasonal relatives						
Deposits forecast using simple exponential smoothing & moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	224 328	2 465	16	2	0
400 000	750 000	226 270	2 486	17	1	0
500 000	750 000	233 414	2 565	18	0	0
600 000	750 000	234 472	2 577	17	0	0
700 000	750 000	241 058	2 649	18	0	0
800 000	750 000	251 250	2 761	18	0	0
900 000	750 000	253 161	2 782	18	0	0
1 000 000	750 000	254 435	2 796	18	0	0

Appendix Q2-2						
Seasonality of deposits based on a 24 day cycle & withdrawals on 30 day cycle						
Withdrawals forecast using FIT smoothing with a default trend & simple seasonal relatives						
Deposits forecast using simple averages & simple seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	230 035	2 528	16	3	0
400 000	750 000	231 791	2 547	17	1	0
500 000	750 000	227 465	2 500	17	0	0
600 000	750 000	233 414	2 565	18	0	0
700 000	750 000	245 517	2 698	18	0	0
800 000	750 000	248 702	2 733	18	0	0
900 000	750 000	255 811	2 811	17	0	0
1 000 000	750 000	257 938	2 834	18	0	0

Appendix Q2-3						
Seasonality of deposits based on a 24 day cycle & withdrawals on 30 day cycle						
Withdrawals forecast using FIT smoothing with a default trend & simple seasonal relatives						
Deposits forecast using FIT smoothing with a regressed trend & moving seasonal relatives						
ROP	Q=750 000	Total cost	Cost per day	No of normal orders	No of special orders	Number of Shortages
300 000	750 000	224 328	2 465	16	2	0
400 000	750 000	225 098	2 474	16	1	0
500 000	750 000	233 914	2 570	17	1	0
600 000	750 000	234 370	2 575	18	0	0
700 000	750 000	239 784	2 635	18	0	0
800 000	750 000	244 561	2 687	18	0	0
900 000	750 000	253 161	2 782	18	0	0
1 000 000	750 000	252 842	2 778	18	0	0