

PONTIFICIA UNIVERSIDAD CATÓLICA DEL PERÚ
FACULTAD DE CIENCIAS E INGENIERÍA



PONTIFICIA
UNIVERSIDAD
CATÓLICA
DEL PERÚ

**ANÁLISIS, DIAGNÓSTICO Y PROPUESTA DE
MEJORA EN EL CICLO DE ALMACENAMIENTO DE
CONTENEDORES EN UN TERMINAL PORTUARIO**

Anexos de Tesis

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ANEXO 1. Cálculo de removidos

| Mes | Manifiesto | Nave | Condicion | Tamaño | Categoría | Operacion | Deposito | Linea | Servicio | Nombre de Servicio | Tipo de Movimiento | Is Reefet | Num de Mov. |
|-----|------------|------------------|-----------|--------|-----------|-----------|----------|-------|----------|--------------------|--------------------|-----------|-------------|
| 5 | 2015-00825 | CHOAPA TRADER | FCL | 20 | TRSH | Directo | 4004 | MSC | WCSA | WCSA | LOAD | FALSO | 2 |
| 5 | 2015-00825 | CHOAPA TRADER | FCL | 20 | TRSH | Directo | 4004 | MSC | WCSA | WCSA | RECV | FALSO | 2 |
| 5 | 2015-00884 | MAERSK SERANGOON | FCL | 40 | IMPRT | Directo | 3550 | MAE | AC3 | AC3 | DLVR | FALSO | 1 |
| 5 | 2015-00884 | MAERSK SERANGOON | FCL | 40 | IMPRT | Directo | 3550 | MAE | AC3 | AC3 | DSCH | FALSO | 1 |
| 5 | 2015-00981 | KOTA LEGIT | MTY | 40 | IMPRT | Directo | 3181 | PIL | WSA 2 | WSA 2 | DLVR | FALSO | 15 |
| 5 | 2015-00981 | KOTA LEGIT | MTY | 40 | IMPRT | Directo | 3181 | PIL | WSA 2 | WSA 2 | DSCH | FALSO | 15 |
| 5 | 2015-00981 | KOTA LEGIT | MTY | 40 | THRGH | Directo | 3182 | PIL | WSA 2 | WSA 2 | DSCH | FALSO | 6 |
| 5 | 2015-00981 | KOTA LEGIT | MTY | 40 | THRGH | Directo | 3183 | PIL | WSA 2 | WSA 2 | LOAD | FALSO | 3 |
| 5 | 2015-00981 | KOTA LEGIT | MTY | 40 | THRGH | Directo | 3184 | PIL | WSA 2 | WSA 2 | SHOB | FALSO | 3 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | EXPRT | Directo | 3655 | MSC | USEC S | USEC S | LOAD | FALSO | 1 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | EXPRT | Directo | 3655 | MSC | USEC S | USEC S | RECV | FALSO | 1 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | EXPRT | Directo | 3655 | MSC | USEC S | USEC S | SHFT | FALSO | 1 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | EXPRT | Directo | 3655 | MSC | USEC S | USEC S | YARD | FALSO | 1 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | EXPRT | Directo | 3880 | MSC | USEC S | USEC S | LOAD | FALSO | 2 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | EXPRT | Directo | 3880 | MSC | USEC S | USEC S | RECV | FALSO | 2 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | EXPRT | Directo | 3880 | MSC | USEC S | USEC S | YARD | FALSO | 3 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | EXPRT | Directo | 3951 | MSC | USEC S | USEC S | LOAD | FALSO | 3 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | EXPRT | Directo | 3951 | MSC | USEC S | USEC S | RECV | FALSO | 3 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | EXPRT | Directo | 3951 | MSC | USEC S | USEC S | YARD | FALSO | 1 |

| | | | | | | | | | | | | |
|---|------------|-------------|-----|----|-------|-----------|------|-----|--------|------|-------|-----|
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | IMPRT | Indirecto | 3014 | MSC | USEC S | DLVR | FALSO | 36 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | IMPRT | Indirecto | 3014 | MSC | USEC S | DSCH | FALSO | 37 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | IMPRT | Indirecto | 3014 | MSC | USEC S | SHFT | FALSO | 46 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | IMPRT | Indirecto | 3014 | MSC | USEC S | YARD | FALSO | 145 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | IMPRT | Directo | 3029 | MSC | USEC S | DLVR | FALSO | 4 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | IMPRT | Directo | 3029 | MSC | USEC S | DSCH | FALSO | 4 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | IMPRT | Directo | 3033 | MSC | USEC S | DLVR | FALSO | 3 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | IMPRT | Directo | 3033 | MSC | USEC S | DSCH | FALSO | 3 |
| 5 | 2015-01012 | MSC SARISKA | FCL | 20 | IMPRT | Directo | 3033 | MSC | USEC S | SHFT | FALSO | 1 |

Los anexos sólo contienen un extracto de la información completa, pues es de carácter confidencial.

| Tipo de Movimiento | | IMPRT | | | | | | | | | | | |
|--------------------|------|-------|-------|-------|------|------|-------|-------|------|------|------|------|------|
| Mes | DLVR | DSCH | LOAD | RECV | SHFT | YARD | DLVR | DSCH | RECV | SHFT | YARD | DLVR | YARD |
| 1 | DSCH | | 10891 | 10742 | 229 | 2982 | 9794 | 9786 | 4 | 3785 | 3898 | | |
| 2 | YARD | 5 | 11064 | 10921 | 318 | 2988 | 10420 | 10424 | 1 | 4707 | 4942 | | |
| 3 | SHFT | 6 | 12655 | 12497 | 759 | 4129 | 14622 | 14630 | 5 | 7146 | 7561 | | |
| | LOAD | | | | | | | | | | | | |
| | RECV | | | | | | | | | | | | |
| | OTHR | | | | | | | | | | | | |
| | SHOB | | | | | | | | | | | | |

$$\text{Removido de impo} = \frac{\text{Dlvr}}{\text{Shift} + \text{Yard}}$$

$$\text{Removido de expo} = \frac{\text{Load}}{\text{Shift} + \text{Yard}}$$

ANEXO 2. Base de datos de indicador TURN TIME

| TURN TIME | | | | | | | |
|------------|-----|-------|-------------|----------|-----------|----------|-----------|
| Date | mes | Shift | Shift group | EXPORT | | IMPORT | |
| | | | | Quantity | Turn Time | Quantity | Turn Time |
| 01/03/2015 | 3 | 1 | D | 145 | 27 | 107 | 20 |
| 01/03/2015 | 3 | 2 | B | 88 | 19 | 113 | 33 |
| 01/03/2015 | 3 | 3 | C | 16 | 15 | 44 | 22 |
| 02/03/2015 | 3 | 1 | A | 63 | 20 | 82 | 26 |
| 02/03/2015 | 3 | 2 | D | 204 | 17 | 145 | 24 |
| 02/03/2015 | 3 | 3 | B | 175 | 24 | 181 | 22 |
| 03/03/2015 | 3 | 1 | A | 201 | 23 | 153 | 28 |
| 03/03/2015 | 3 | 2 | D | 125 | 24 | 179 | 31 |
| 03/03/2015 | 3 | 3 | B | 119 | 20 | 219 | 29 |
| 04/03/2015 | 3 | 1 | C | 137 | 23 | 184 | 34 |
| 04/03/2015 | 3 | 2 | A | 41 | 20 | 220 | 29 |
| 04/03/2015 | 3 | 3 | D | 57 | 29 | 190 | 30 |
| 05/03/2015 | 3 | 1 | C | 58 | 17 | 201 | 31 |
| 05/03/2015 | 3 | 2 | A | 55 | 27 | 143 | 30 |
| 05/03/2015 | 3 | 3 | D | 54 | 22 | 107 | 38 |
| 06/03/2015 | 3 | 1 | B | 13 | 19 | 182 | 29 |
| 06/03/2015 | 3 | 2 | C | 49 | 35 | 183 | 35 |
| 06/03/2015 | 3 | 3 | A | 119 | 29 | 568 | 30 |
| 07/03/2015 | 3 | 1 | B | 105 | 26 | 197 | 29 |
| 07/03/2015 | 3 | 2 | C | 128 | 33 | 117 | 31 |
| 07/03/2015 | 3 | 3 | A | 94 | 23 | 132 | 30 |
| 08/03/2015 | 3 | 1 | D | 213 | 17 | 183 | 28 |
| 08/03/2015 | 3 | 2 | B | 242 | 20 | 188 | 25 |
| 08/03/2015 | 3 | 3 | A | 139 | 22 | 99 | 25 |
| 09/03/2015 | 3 | 1 | D | 50 | 18 | 82 | 33 |
| 09/03/2015 | 3 | 2 | B | 154 | 20 | 32 | 23 |
| 09/03/2015 | 3 | 3 | A | 262 | 22 | 8 | 28 |
| 10/03/2015 | 3 | 1 | A | 157 | 20 | 20 | 26 |
| 10/03/2015 | 3 | 2 | D | 97 | 19 | 93 | 32 |
| 10/03/2015 | 3 | 3 | B | 150 | 23 | 190 | 63 |
| 11/03/2015 | 3 | 1 | A | 84 | 26 | 156 | 28 |
| 11/03/2015 | 3 | 2 | D | 144 | 18 | 189 | 37 |
| 11/03/2015 | 3 | 3 | B | 165 | 22 | 197 | 32 |
| 12/03/2015 | 3 | 1 | C | 177 | 19 | 160 | 34 |

Los anexos sólo contienen un extracto de la información completa, pues es de carácter confidencial.

ANEXO 3. Base de datos de indicador productividad

| Año | Meses | Semana | Nombre de la Nave | Muelle | Manifiesto | Línea Naviera | Servicio | Agencia Marítima | Inicio de Operaciones | Término de Operaciones | Movimientos totales | Tiempo total | Productividad |
|------|-------|--------|--------------------|--------|------------|---------------|----------------|--|-----------------------|------------------------|---------------------|--------------|---------------|
| 2015 | 3 | 9 | APL MELBOURNE | 05A | 2015-00507 | APL | ACW N/B | TERMINALES PORTUARIOS PERUANOS S.A.C. | 28/02 18:20 | 01/03 03:05 | 408 | 13:26:00 | 30.37 |
| 2015 | 3 | 10 | ARIAN | 03B | 2015-00313 | CMA CGM | INCA N | UNIMAR | 01/03 16:10 | 02/03 03:45 | 151 | 10:06:00 | 14.95 |
| 2015 | 3 | 10 | MAERSK SEBAROK | 05A | 2015-00516 | MAERSK | AC3 | IAN TAYLOR PERU S.A.C. | 01/03 13:20 | 02/03 06:40 | 168 | 15:03:00 | 11.16 |
| 2015 | 3 | 10 | MAERSK SEBAROK | 05A | 2015-00516 | MAERSK | AC3 | IAN TAYLOR PERU S.A.C. | 01/03 13:15 | 02/03 10:50 | 1073 | 38:12:00 | 28.09 |
| 2015 | 3 | 10 | CNP PAITA | 03B | 2015-00485 | NOR | PAITA | TRABAJOS MARITIMOS S.A. | 02/03 16:45 | 03/03 11:47 | 417 | 29:34:00 | 14.10 |
| 2015 | 3 | 10 | MSC ROSARIA | 05A | 2015-00505 | MSC | USEC WCSA N | MEDITERRANEAN SHIPPING COMPANY DEL PERU S.A.C. | 03/03 08:55 | 03/03 14:30 | 94 | 05:35:00 | 16.84 |
| 2015 | 3 | 10 | WARNOW DOLPHIN | 03B | 2015-00510 | CMA CGM | INCA S | UNIMAR | 03/03 15:43 | 03/03 22:05 | 179 | 10:35:00 | 16.91 |
| 2015 | 3 | 10 | MSC ROSARIA | 05A | 2015-00505 | MSC | USEC WCSA N | MEDITERRANEAN SHIPPING COMPANY DEL PERU S.A.C. | 03/03 08:10 | 04/03 02:10 | 939 | 30:21:00 | 30.94 |
| 2015 | 3 | 10 | MSC VAISHNAVI | 05A | 2015-00503 | MSC | USEC WCSA S | MEDITERRANEAN SHIPPING COMPANY DEL PERU S.A.C. | 04/03 10:00 | 04/03 22:45 | 614 | 21:00:00 | 29.24 |
| 2015 | 3 | 10 | SUSANNE SCHULTE | 03B | 2015-00532 | MAERSK | ATACAMA | IAN TAYLOR PERU S.A.C. | 04/03 01:55 | 05/03 05:40 | 660 | 49:21:00 | 13.37 |
| 2015 | 3 | 10 | EVER UNISON | 05A | 2015-00406 | EVG | WSA 2 | TERMINALES PORTUARIOS PERUANOS S.A.C. | 05/03 03:25 | 05/03 20:05 | 836 | 28:25:00 | 29.42 |
| 2015 | 3 | 10 | FIONA | 03A | 2015-00529 | NOR | MEDITERRANEO | TRABAJOS MARITIMOS S.A. | 05/03 15:40 | 06/03 03:55 | 243 | 16:32:00 | 14.70 |
| 2015 | 3 | 10 | SONCHE TRADER | 05A | 2015-00502 | MSC | WCSA 1 | MEDITERRANEAN SHIPPING COMPANY DEL PERU S.A.C. | 06/03 00:05 | 06/03 19:30 | 880 | 30:05:00 | 29.25 |

| | | | | | | | | | | |
|----------|-----------------|------------|------------------|-------------|--|-------------|-------------|-----|-----------|-------|
| 2015-03B | ARAGONBOR G | 2015-00504 | CCN | AMERIC | AGENCIAS UNIVERSALES PERU S.A. | 06/03 01:00 | 07/03 13:20 | 227 | 27:46 :00 | 8.18 |
| 2015-05A | CRISTINA STAR | 2015-00523 | MOL | ACW S/B | TMA S.A.C. AGENTES MARITIMOS | 07/03 08:15 | 07/03 18:35 | 473 | 12:52 :00 | 36.76 |
| 2015-03A | WARNOW ORCA | 2015-00558 | EVG | PWS | TERMINALES PORTUARIOS PERUANOS S.A.C. | 07/03 15:40 | 08/03 00:45 | 164 | 08:16 :00 | 19.84 |
| 2015-03A | STADT JENA | 2015-00555 | CMA CGM | INCA N | UNIMAR | 08/03 08:00 | 08/03 12:50 | 168 | 08:55 :00 | 18.84 |
| 2015-05A | ARCHIMIDIS | 2015-00582 | MAERSK | AC3 | IAN TAYLOR PERU S.A.C. | 10/03 00:55 | 10/03 13:43 | 172 | 11:33 :00 | 14.89 |
| 2015-05A | ARCHIMIDIS | 2015-00582 | MAERSK | AC3 | IAN TAYLOR PERU S.A.C. | 10/03 01:00 | 10/03 14:15 | 684 | 21:45 :00 | 31.45 |
| 2015-05A | MSC FEDERICA | 2015-00561 | MSC | USEC WCSA S | MEDITERRANEAN SHIPPING COMPANY DEL PERU S.A.C. | 10/03 18:50 | 11/03 04:20 | 129 | 08:52 :00 | 14.55 |
| 2015-03B | SEABOARD CHILE | 2015-00550 | SEABOARD | GWCSA | NAUTILIUS S.A. | 10/03 09:05 | 11/03 04:45 | 257 | 24:26 :00 | 10.52 |
| 2015-05A | MSC FEDERICA | 2015-00561 | MSC | USEC WCSA S | MEDITERRANEAN SHIPPING COMPANY DEL PERU S.A.C. | 10/03 18:40 | 11/03 05:15 | 482 | 18:12 :00 | 26.48 |
| 2015-03A | FRANCOISE GILOT | 2015-00576 | CMA CGM | INCA S | UNIMAR | 10/03 18:00 | 11/03 07:00 | 192 | 10:12 :00 | 18.82 |
| 2015-05A | KIEL TRADER | 2015-00591 | MAERSK | ATACAMA | IAN TAYLOR PERU S.A.C. | 11/03 11:00 | 11/03 15:00 | 72 | 03:50 :00 | 18.78 |
| 2015-05A | KIEL TRADER | 2015-00591 | MAERSK | ATACAMA | IAN TAYLOR PERU S.A.C. | 11/03 10:33 | 12/03 06:12 | 752 | 29:00 :00 | 25.93 |
| 2015-03A | SAN RAFAEL | 2015-00527 | INTEROCEA N LINE | TSL WCSA | AGENCIAS UNIVERSALES PERU S.A. | 12/03 15:00 | 12/03 23:00 | 77 | 13:00 :00 | 5.92 |
| 2015-03A | SAN RAFAEL | 2015-00527 | INTEROCEA N LINE | TSL WCSA | AGENCIAS UNIVERSALES PERU S.A. | 11/03 12:15 | 13/03 04:20 | 454 | 38:50 :00 | 11.69 |

Los anexos sólo contienen un extracto de la información completa, pues es de carácter confidencial

ANEXO 4. Programación de amarradero

| DÍA | TURNO | 11A | 07A | 01B | 02A | 02B | 03A | 03C | 03B | 04A | 04B | 05A | 05B | 05D | 07A | 07B |
|-----|-------|---|---|--|--|---|--|---|---|---|---|---|--|--|---|-----|
| 04 | 07-15 | OCEAN DREAM ETA: 030500 ETB: 030654 ETD: 061100 204.75 / 29.70 IAN TAYLOR PASAJEROS | NOCC MATTEGAT (V) ETA: 040300 ETB: 040548 | SPL TARAPACA ETA: 250800 ETB: 020630 ETD: 061300 180.0 / 30.00 CANOPIUS 2015-2785 MAIZ D/ 32.848 | DITLEV REEFER ETA: 302000 ETB: 012340 ETD: 060500 164.33 / 24.00 SERPAC NITRATO EN 2015-2714 BOLSONES D/ 9.376.81 | PINE 2 IMO 1.1 ETA: 252336 ETB: 040740 ETD: 070500 182.91 / 28.39 SERPAC 2015-2615 (planchas, conveyors, vigas, tubos) MT D/ 4.509.555 | KATHARINA B POAVOSA WISDOM VI ETA: 272200 ETB: 040656 ETD: 060500 169.37 / 27.2 CANOPIUS 2015-2852 MALTA A GRANEL D/ 4.500 TM | NOVO XEIXAL ETA: 010530 ETB: 021530 ETD: 050700 32.50 / 7.80 DOLMAR 2015-2907 PESCADO CANOPIUS CONGELDO ZHONG YUAN YU 16 | KMARIN MUGUNGWHA (-1) ETA: 261000 ETB: 022242 ETD: 051300 180.0 / 30. CANOPIUS 2015-2772 MAIZ D/ 22.482 | MTM HOUSTON ETA: 271300 ETB: 010001 ETD: 051300 144.03 / 24.20 TRAMARSA 2015-2825 ACETTE SOYA D/ 18200 TM | LIMPIEZA ANTU (40) ETA: 312300 ETD: 040700 ETD: 050700 64.15 / 12.1 PETROTANKERS 2015- | HELENE S (V) ETA: 040812 ETB: 041706 ETD: 051900 199.93 / 32.2 IAN TAYLOR 2015-2924 | SEAHARMONY (1) PLEA ETA: 020800 ETB: 021512 ETD: 060700 199.99 / 32.26 EMSUR 2015-2771 ROCA FOSSFORICA D/ 46932 TM | MAR PACIFICO ETA: 040500 ETB: 042300 ETD: 061300 179.00 / 27.36 RENADSA 2015-239 GLP D/ 5000 | OVERSEAS ANDROMAR ETA: 271200 ETB: 050100 ETD: 061300 183.0 / 32.23 RENADSA 2015-8637 DERIVADOS DE PETROLEO D/ 40.00 MB | |
| 05 | 07-15 | | | | | | | | | | | | | | | |
| 06 | 07-15 | | | | | | | | | | | | | | | |
| 07 | 07-15 | | | | | | | | | | | | | | | |
| 07 | 15-23 | | | | | | | | | | | | | | | |
| 07 | 23-07 | | | | | | | | | | | | | | | |
| 08 | 07-15 | | | | | | | | | | | | | | | |
| 08 | 15-23 | | | | | | | | | | | | | | | |
| 08 | 23-07 | | | | | | | | | | | | | | | |
| 09 | 07-15 | | | | | | | | | | | | | | | |
| 09 | 15-23 | | | | | | | | | | | | | | | |

ANEXO 5. Planificación de recursos

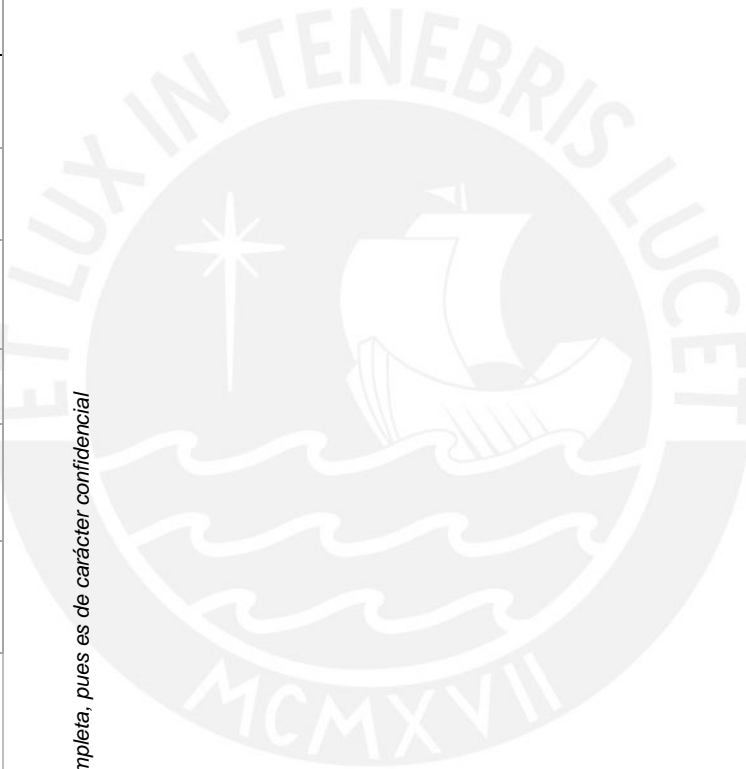
RECURSOS

| Date | Shift | mes | Shift group | Required | | | | | | Used | | | | | | | |
|------------|-------|-----|-------------|----------|----|----|-----|-----|-----|------|----|----|-----|-----|-----|---|---|
| | | | | RS | TT | EH | RTG | MHC | STS | RS | TT | EH | RTG | MHC | STS | | |
| 01/03/2015 | 1 | 3 | D | 8 | 19 | 1 | 6 | 1 | 6 | 1 | 2 | 8 | 19 | 1 | 6 | 1 | 2 |
| 01/03/2015 | 2 | 3 | B | 8 | 23 | 1 | 6 | 2 | 6 | 2 | 2 | 7 | 23 | 1 | 6 | 2 | 2 |
| 01/03/2015 | 3 | 3 | C | 7 | 19 | 1 | 6 | 2 | 6 | 2 | 2 | 7 | 19 | 1 | 6 | 2 | 2 |
| 02/03/2015 | 1 | 3 | A | 6 | 10 | 1 | 6 | | 6 | | 2 | 6 | 12 | 1 | 6 | | 2 |
| 02/03/2015 | 2 | 3 | D | 7 | 15 | 1 | 6 | 2 | 6 | 2 | | 7 | 15 | 1 | 6 | 2 | |
| 02/03/2015 | 3 | 3 | B | 7 | 13 | 1 | 6 | 2 | 6 | 2 | | 8 | 15 | 1 | 5 | 2 | |
| 03/03/2015 | 1 | 3 | A | 7 | 18 | 1 | 6 | 4 | 6 | 4 | 2 | 7 | 20 | 1 | 6 | 4 | 2 |
| 03/03/2015 | 2 | 3 | D | 9 | 25 | 1 | 6 | 2 | 6 | 2 | 2 | 10 | 25 | 1 | 6 | 2 | 2 |
| 03/03/2015 | 3 | 3 | B | 8 | 21 | 1 | 6 | 2 | 6 | 2 | 2 | 7 | 23 | 1 | 6 | 2 | 2 |
| 04/03/2015 | 1 | 3 | C | 7 | 24 | 1 | 6 | 2 | 6 | 2 | 2 | 7 | 24 | 1 | 6 | 2 | 2 |
| 04/03/2015 | 2 | 3 | A | 7 | 18 | 1 | 6 | 2 | 6 | 2 | 2 | 7 | 18 | 1 | 6 | 2 | 2 |
| 04/03/2015 | 3 | 3 | D | 8 | 25 | 1 | 6 | 3 | 6 | 3 | 2 | 8 | 25 | 1 | 6 | 3 | 2 |
| 05/03/2015 | 1 | 3 | C | 7 | 20 | 1 | 6 | | 6 | | 2 | 7 | 20 | 1 | 6 | | 2 |
| 06/03/2015 | 1 | 3 | B | 6 | | 1 | 6 | | 6 | | | 8 | | 1 | 6 | | |
| 06/03/2015 | 2 | 3 | C | 8 | 14 | 1 | 6 | | 6 | 1 | 1 | 8 | 14 | 1 | 6 | | 2 |
| 06/03/2015 | 3 | 3 | A | 6 | | 1 | 6 | | 6 | | | 8 | | 1 | 6 | | |
| 07/03/2015 | 1 | 3 | B | 8 | 17 | 1 | 6 | | 6 | | 2 | 8 | 18 | 1 | 7 | | 2 |
| 07/03/2015 | 2 | 3 | C | 6 | 15 | 1 | 6 | 1 | 6 | 1 | 1 | 6 | 15 | 1 | 6 | 1 | 1 |
| 07/03/2015 | 3 | 3 | A | 7 | 5 | 1 | 6 | 1 | 6 | 1 | | 7 | 6 | 1 | 6 | 1 | 1 |

| | | | | | | | | | | | | | | | |
|------------|---|---|---|---|----|---|---|---|---|----|----|---|---|---|---|
| 08/03/2015 | 1 | 3 | D | 7 | 8 | 1 | 6 | 2 | | 8 | 10 | 1 | 6 | 2 | |
| 08/03/2015 | 2 | 3 | B | 6 | 5 | 1 | | | | 7 | 10 | 2 | 6 | | |
| 08/03/2015 | 3 | 3 | A | 7 | 9 | 1 | 6 | | | 7 | 9 | 1 | 6 | | |
| 09/03/2015 | 1 | 3 | D | 8 | 10 | 1 | 6 | | | 8 | 10 | 1 | 6 | | |
| 09/03/2015 | 2 | 3 | B | 7 | 9 | 1 | 6 | | | 7 | 12 | 1 | 6 | | |
| 09/03/2015 | 3 | 3 | A | 8 | 15 | 1 | 6 | 1 | 2 | 8 | 15 | 1 | 6 | 1 | 2 |
| 10/03/2015 | 1 | 3 | A | 7 | 24 | 1 | 6 | 4 | 2 | 8 | 22 | 1 | 6 | 4 | 2 |
| 10/03/2015 | 2 | 3 | D | 8 | 23 | 1 | 6 | 4 | 2 | 9 | 23 | 1 | 6 | 4 | 2 |
| 10/03/2015 | 3 | 3 | B | 9 | 27 | 1 | 6 | 4 | 2 | 9 | 26 | 1 | 6 | 4 | 2 |
| 11/03/2015 | 1 | 3 | A | 7 | 22 | 1 | 6 | 2 | 2 | 7 | 22 | 1 | 6 | 2 | 2 |
| 11/03/2015 | 2 | 3 | D | 9 | 20 | 1 | 6 | 2 | 2 | 9 | 20 | 1 | 6 | 2 | 2 |
| 11/03/2015 | 3 | 3 | B | 7 | 17 | 1 | 6 | 2 | 1 | 6 | 20 | 1 | 6 | 2 | 1 |
| 12/03/2015 | 1 | 3 | C | 8 | 22 | 1 | 6 | 2 | 2 | 8 | 22 | 1 | 6 | 2 | 2 |
| 12/03/2015 | 2 | 3 | A | 9 | 18 | 1 | 6 | | 2 | 10 | 18 | 1 | 6 | | 2 |
| 12/03/2015 | 3 | 3 | D | 8 | 18 | 1 | 6 | 2 | 2 | 9 | 18 | 1 | 6 | 2 | 2 |
| 13/03/2015 | 1 | 3 | C | 6 | 17 | 1 | 6 | 1 | 1 | 6 | 17 | 1 | 6 | 1 | 1 |
| 13/03/2015 | 2 | 3 | A | 7 | 17 | 1 | 6 | 2 | 2 | 7 | 17 | 1 | 6 | 2 | 2 |
| 13/03/2015 | 3 | 3 | D | 7 | 14 | 1 | 6 | 1 | 2 | 8 | 18 | 1 | 6 | 2 | 2 |
| 14/03/2015 | 1 | 3 | B | 7 | 18 | 1 | 6 | 1 | 2 | 7 | 26 | 1 | 6 | 1 | 2 |
| 14/03/2015 | 2 | 3 | C | 7 | 22 | 1 | 6 | 1 | 2 | 7 | 22 | 1 | 6 | 1 | 2 |
| 14/03/2015 | 3 | 3 | A | 9 | 16 | 1 | 6 | 2 | 2 | 9 | 18 | 1 | 6 | 2 | 2 |
| 15/03/2015 | 1 | 3 | B | 8 | 26 | 1 | 6 | 3 | 2 | 8 | 25 | 1 | 6 | 3 | 2 |
| 15/03/2015 | 2 | 3 | C | 8 | 23 | 1 | 5 | 4 | 2 | 8 | 23 | 1 | 5 | 4 | 2 |
| 15/03/2015 | 3 | 3 | A | 8 | 20 | 1 | 5 | 3 | 2 | 7 | 21 | 2 | 5 | 3 | 2 |
| 16/03/2015 | 1 | 3 | D | 7 | 22 | 1 | 6 | 3 | 2 | 7 | 22 | 1 | 6 | 3 | 2 |

| | | | | | | | | | | | | | | | |
|------------|---|---|---|---|----|---|---|---|---|---|----|---|---|---|---|
| 16/03/2015 | 2 | 3 | B | 9 | 26 | 1 | 6 | 2 | 2 | 8 | 27 | 1 | 6 | 3 | 2 |
| 16/03/2015 | 3 | 3 | C | 7 | 25 | 1 | 6 | 2 | 2 | 7 | 25 | 1 | 6 | 2 | 2 |
| 17/03/2015 | 1 | 3 | D | 9 | 22 | 1 | 6 | 3 | 2 | 9 | 22 | 1 | 6 | 3 | 2 |

Los anexos sólo contienen un extracto de la información completa, pues es de carácter confidencial



ANEXO 6. Transacciones de ingreso y salida del puerto

| |
|---------------|
| TRANSACCIONES |
|---------------|

| | |
|----------|-----------------------|
| Periodo: | 01/03 - 01/05 2015 |
|----------|-----------------------|

| PLACA | TIPO DE CARGA | TIPO | START DATE | Tiempo inicio | Mes inicio | FINAL DATE | Tiempo fin | Mes fin | Día ini |
|--------|-------------------|--------------------------------|------------|---------------|------------|------------|------------|---------|---------|
| B8E926 | CONTENEDORES | E | 01/03/2015 | 0:00:00 | 3 | 01/03/2015 | 0:21:00 | 3 | domingo |
| B8E926 | CONTENEDORES | E | 01/03/2015 | 0:00:00 | 3 | 01/03/2015 | 0:22:00 | 3 | domingo |
| D8I870 | CONTENEDORES | I | 01/03/2015 | 0:08:00 | 3 | 01/03/2015 | 0:35:00 | 3 | domingo |
| C1X915 | CONTENEDORES | I | 01/03/2015 | 0:11:00 | 3 | 01/03/2015 | 0:36:00 | 3 | domingo |
| C5V791 | CONTENEDORES | E | 01/03/2015 | 0:04:00 | 3 | 01/03/2015 | 0:36:00 | 3 | domingo |
| C5V791 | CONTENEDORES | E | 01/03/2015 | 0:04:00 | 3 | 01/03/2015 | 0:37:00 | 3 | domingo |
| C5V788 | CONTENEDORES | E | 01/03/2015 | 0:06:00 | 3 | 01/03/2015 | 0:39:00 | 3 | domingo |
| C5V788 | CONTENEDORES | E | 01/03/2015 | 0:06:00 | 3 | 01/03/2015 | 0:40:00 | 3 | domingo |
| P1X782 | CONTENEDORES | I | 01/03/2015 | 0:14:00 | 3 | 01/03/2015 | 0:41:00 | 3 | domingo |
| C2S804 | CONTENEDORES | E | 01/03/2015 | 0:06:00 | 3 | 01/03/2015 | 0:42:00 | 3 | domingo |
| C2S804 | CONTENEDORES | E | 01/03/2015 | 0:06:00 | 3 | 01/03/2015 | 0:43:00 | 3 | domingo |
| C5T766 | CONTENEDORES | E | 01/03/2015 | 0:11:00 | 3 | 01/03/2015 | 0:44:00 | 3 | domingo |
| C5T766 | CONTENEDORES | E | 01/03/2015 | 0:11:00 | 3 | 01/03/2015 | 0:46:00 | 3 | domingo |
| D2A930 | CONTENEDORES | I | 01/03/2015 | 0:17:00 | 3 | 01/03/2015 | 0:47:00 | 3 | domingo |
| D1K897 | CONTENEDORES | E | 01/03/2015 | 0:17:00 | 3 | 01/03/2015 | 0:48:00 | 3 | domingo |
| D9Q759 | GRANEL EN GENERAL | Descarga Directa Internacional | 01/03/2015 | 0:07:00 | 3 | 01/03/2015 | 0:48:00 | 3 | domingo |
| D0N869 | GRANEL EN GENERAL | Descarga Directa Internacional | 01/03/2015 | 0:06:00 | 3 | 01/03/2015 | 0:48:00 | 3 | domingo |
| D1K897 | CONTENEDORES | E | 01/03/2015 | 0:17:00 | 3 | 01/03/2015 | 0:50:00 | 3 | domingo |
| D8T920 | GRANEL EN GENERAL | Descarga Directa Internacional | 01/03/2015 | 0:11:00 | 3 | 01/03/2015 | 0:51:00 | 3 | domingo |
| B0Z839 | CONTENEDORES | E | 01/03/2015 | 0:24:00 | 3 | 01/03/2015 | 0:53:00 | 3 | domingo |
| D9P844 | CONTENEDORES | I | 01/03/2015 | 0:30:00 | 3 | 01/03/2015 | 0:53:00 | 3 | domingo |
| A0S907 | CONTENEDORES | I | 01/03/2015 | 0:00:00 | 3 | 01/03/2015 | 0:55:00 | 3 | domingo |
| B0Z839 | CONTENEDORES | E | 01/03/2015 | 0:24:00 | 3 | 01/03/2015 | 0:55:00 | 3 | domingo |
| F1K907 | CONTENEDORES | E | 01/03/2015 | 0:15:00 | 3 | 01/03/2015 | 0:56:00 | 3 | domingo |
| F1K907 | CONTENEDORES | E | 01/03/2015 | 0:15:00 | 3 | 01/03/2015 | 0:58:00 | 3 | domingo |
| F2B703 | GRANEL EN GENERAL | Descarga Directa | 01/03/2015 | 0:09:00 | 3 | 01/03/2015 | 0:58:00 | 3 | domingo |

| | | | | | | | | | |
|--------|-------------------|--------------------------------|------------|---------|---|------------|---------|---|---------|
| | | Internacional | | | | | | | |
| F7E788 | CONTENEDORES | I | 01/03/2015 | 0:23:00 | 3 | 01/03/2015 | 0:59:00 | 3 | domingo |
| D0I914 | GRANEL EN GENERAL | Descarga Directa Internacional | 01/03/2015 | 0:23:00 | 3 | 01/03/2015 | 0:59:00 | 3 | domingo |
| B0Z837 | CONTENEDORES | E | 01/03/2015 | 0:20:00 | 3 | 01/03/2015 | 1:00:00 | 3 | domingo |
| B0Z837 | CONTENEDORES | E | 01/03/2015 | 0:20:00 | 3 | 01/03/2015 | 1:00:00 | 3 | domingo |
| A6W880 | CONTENEDORES | I | 01/03/2015 | 0:01:00 | 3 | 01/03/2015 | 1:01:00 | 3 | domingo |
| D4F920 | CONTENEDORES | I | 01/03/2015 | 0:03:00 | 3 | 01/03/2015 | 1:02:00 | 3 | domingo |
| C2S803 | CONTENEDORES | E | 01/03/2015 | 0:18:00 | 3 | 01/03/2015 | 1:03:00 | 3 | domingo |
| C2S803 | CONTENEDORES | E | 01/03/2015 | 0:18:00 | 3 | 01/03/2015 | 1:04:00 | 3 | domingo |
| D0I918 | GRANEL EN GENERAL | Descarga Directa Internacional | 01/03/2015 | 0:34:00 | 3 | 01/03/2015 | 1:04:00 | 3 | domingo |
| C7Y835 | GRANEL EN GENERAL | Descarga Directa Internacional | 01/03/2015 | 0:05:00 | 3 | 01/03/2015 | 1:04:00 | 3 | domingo |
| Y1L823 | CONTENEDORES | E | 01/03/2015 | 0:20:00 | 3 | 01/03/2015 | 1:06:00 | 3 | domingo |
| Y1L823 | CONTENEDORES | E | 01/03/2015 | 0:20:00 | 3 | 01/03/2015 | 1:07:00 | 3 | domingo |
| F1K806 | CONTENEDORES | E | 01/03/2015 | 0:32:00 | 3 | 01/03/2015 | 1:09:00 | 3 | domingo |
| F1K806 | CONTENEDORES | E | 01/03/2015 | 0:32:00 | 3 | 01/03/2015 | 1:10:00 | 3 | domingo |
| D1G881 | CONTENEDORES | E | 01/03/2015 | 0:26:00 | 3 | 01/03/2015 | 1:12:00 | 3 | domingo |
| D1G881 | CONTENEDORES | E | 01/03/2015 | 0:26:00 | 3 | 01/03/2015 | 1:13:00 | 3 | domingo |
| B0Z838 | CONTENEDORES | E | 01/03/2015 | 0:24:00 | 3 | 01/03/2015 | 1:16:00 | 3 | domingo |
| B0Z838 | CONTENEDORES | E | 01/03/2015 | 0:24:00 | 3 | 01/03/2015 | 1:16:00 | 3 | domingo |
| D0T784 | GRANEL EN GENERAL | Descarga Directa Internacional | 01/03/2015 | 0:03:00 | 3 | 01/03/2015 | 1:17:00 | 3 | domingo |
| D7E925 | CONTENEDORES | I | 01/03/2015 | 0:56:00 | 3 | 01/03/2015 | 1:18:00 | 3 | domingo |
| D1K899 | CONTENEDORES | E | 01/03/2015 | 0:30:00 | 3 | 01/03/2015 | 1:18:00 | 3 | domingo |
| D1K899 | CONTENEDORES | E | 01/03/2015 | 0:30:00 | 3 | 01/03/2015 | 1:19:00 | 3 | domingo |
| D8B761 | CONTENEDORES | I | 01/03/2015 | 0:49:00 | 3 | 01/03/2015 | 1:20:00 | 3 | domingo |
| D0T817 | GRANEL EN GENERAL | Descarga Directa Internacional | 01/03/2015 | 1:02:00 | 3 | 01/03/2015 | 1:22:00 | 3 | domingo |
| A7F862 | CONTENEDORES | I | 01/03/2015 | 1:01:00 | 3 | 01/03/2015 | 1:25:00 | 3 | domingo |
| C5U736 | CONTENEDORES | E | 01/03/2015 | 0:36:00 | 3 | 01/03/2015 | 1:27:00 | 3 | domingo |

Los anexos sólo contienen un extracto de la información completa, pues es de carácter confidencial.

ANEXO 8. Layout del terminal portuario

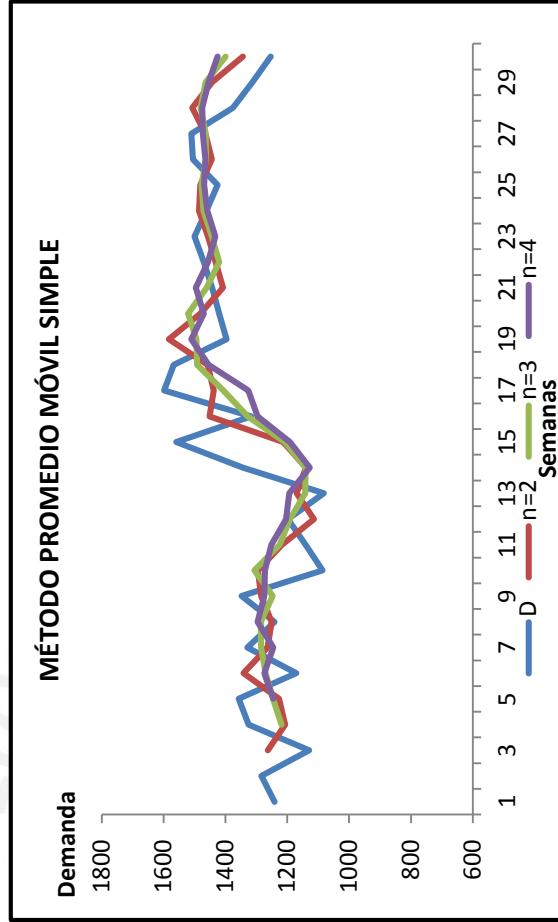


ANEXO 9. Evaluación de pronósticos de movimientos de movimientos por servicio

AC3

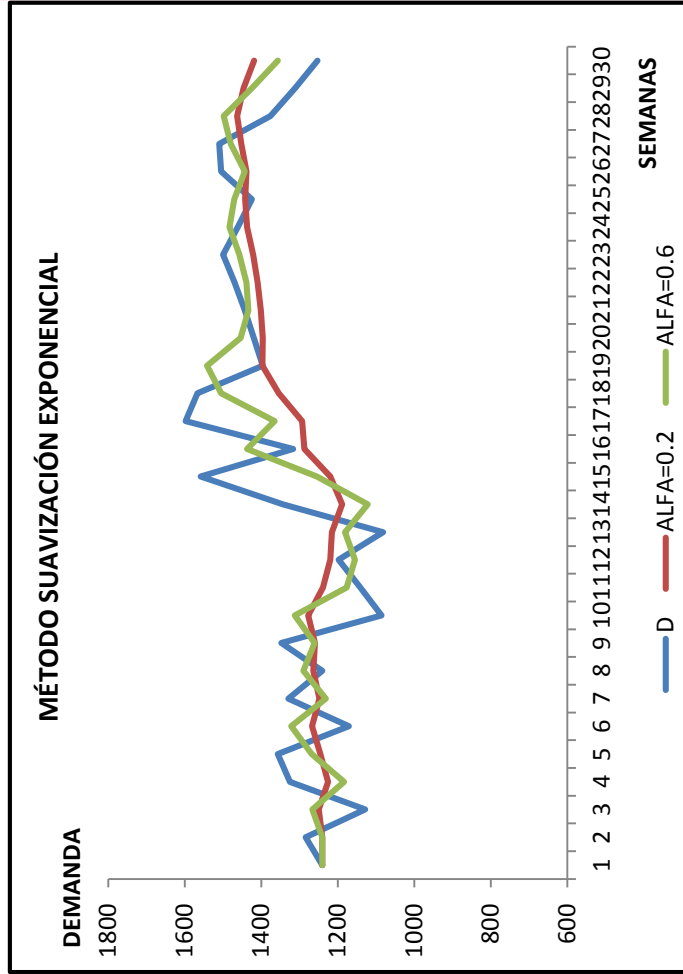
| PROMEDIO MÓVIL | | | | | | | | | |
|----------------|------|-------|-------|-------|----|------|----------|-------|------|
| SEMANA | D | n=2 | n=3 | n=4 | Et | Et2 | /Et/ | E% | |
| 1 | 1241 | | | | | | | | |
| 2 | 1284 | | | | | | | | |
| 3 | 1129 | 1,263 | | | | -134 | 17822.25 | 134 | 12% |
| 4 | 1325 | 1,207 | 1,218 | | | 119 | 14042.25 | 119 | 9% |
| 5 | 1357 | 1,227 | 1,246 | 1,245 | | 130 | 16900 | 130 | 10% |
| 6 | 1171 | 1,341 | 1,270 | 1,274 | | -170 | 28900 | 170 | 15% |
| 7 | 1329 | 1,264 | 1,284 | 1,246 | | 65 | 4225 | 65 | 5% |
| 8 | 1241 | 1,250 | 1,286 | 1,296 | | -9 | 81 | 9 | 1% |
| 9 | 1348 | 1,285 | 1,247 | 1,275 | | 63 | 3969 | 63 | 5% |
| 10 | 1086 | 1,295 | 1,306 | 1,272 | | -209 | 43472.25 | 209 | 19% |
| 11 | 1141 | 1,217 | 1,225 | 1,251 | | -76 | 5776 | 76 | 7% |
| 12 | 1198 | 1,114 | 1,192 | 1,204 | | 85 | 7140.25 | 85 | 7% |
| 13 | 1082 | 1,170 | 1,142 | 1,193 | | -88 | 7656.25 | 88 | 8% |
| 14 | 1344 | 1,140 | 1,140 | 1,127 | | 204 | 41616 | 204 | 15% |
| 15 | 1559 | 1,213 | 1,208 | 1,191 | | 346 | 119716 | 346 | 22% |
| 16 | 1317 | 1,452 | 1,328 | 1,296 | | -135 | 18090.25 | 135 | 10% |
| 17 | 1598 | 1,438 | 1,407 | 1,326 | | 160 | 25600 | 160 | 10% |
| 18 | 1567 | 1,458 | 1,491 | 1,455 | | 110 | 11990.25 | 110 | 7% |
| 19 | 1396 | 1,583 | 1,494 | 1,510 | | -187 | 34782.25 | 187 | 13% |
| 20 | 1420 | 1,482 | 1,520 | 1,470 | | -62 | 3782.25 | 62 | 4% |
| 21 | 1443 | 1,408 | 1,461 | 1,495 | | 35 | 1225 | 35 | 2% |
| 22 | 1470 | 1,432 | 1,420 | 1,457 | | 39 | 1482.25 | 39 | 3% |
| 23 | 1500 | 1,457 | 1,444 | 1,432 | | 44 | 1892.25 | 44 | 3% |
| 24 | 1462 | 1,485 | 1,471 | 1,458 | | -23 | 529 | 23 | 2% |
| 25 | 1425 | 1,481 | 1,477 | 1,469 | | -56 | 3136 | 56 | 4% |
| 26 | 1505 | 1,444 | 1,462 | 1,464 | | 62 | 3782.25 | 62 | 4% |
| 27 | 1510 | 1,465 | 1,464 | 1,473 | | 45 | 2025 | 45 | 3% |
| 28 | 1376 | 1,508 | 1,480 | 1,476 | | -102 | 17292.25 | 132 | 10% |
| 29 | 1312 | 1,443 | 1,464 | 1,454 | | -131 | 17161 | 131 | 10% |
| 30 | 1253 | 1,344 | 1,399 | 1,426 | | -91 | 8281 | 91 | 7% |
| 31 | | 1,283 | 1,314 | 1,363 | | 5 | 462,367 | 3,004 | 226% |

CV 0.11



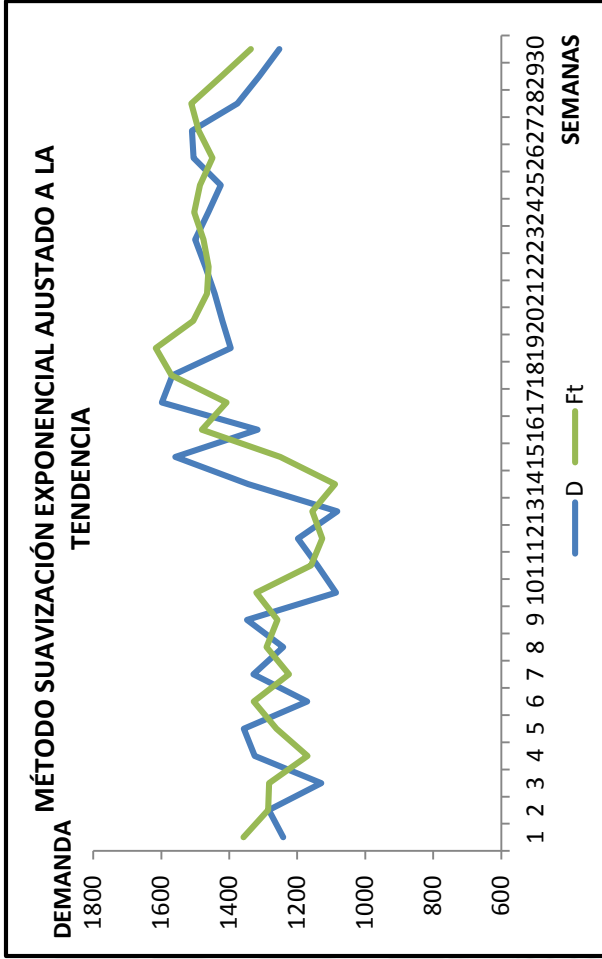
Suavización exponencial

| SEMANA | D | ALFA | | Et | Et2 | /Et/ | E% |
|-----------|------|-------|-------|------|------------|----------|------|
| | | 0.2 | 0.6 | | | | |
| 1 | 1241 | 1,241 | 1,241 | - | - | - | 0% |
| 2 | 1284 | 1,241 | 1,241 | 43 | 1,849.00 | 43.00 | 3% |
| 3 | 1129 | 1,250 | 1,267 | -138 | 18,988.84 | 137.80 | 12% |
| 4 | 1325 | 1,225 | 1,184 | 141 | 19,847.17 | 140.88 | 11% |
| 5 | 1357 | 1,245 | 1,269 | 88 | 7,806.08 | 88.35 | 7% |
| 6 | 1171 | 1,268 | 1,322 | -151 | 22,698.19 | 150.66 | 13% |
| 7 | 1329 | 1,248 | 1,231 | 98 | 9,552.39 | 97.74 | 7% |
| 8 | 1241 | 1,264 | 1,290 | -49 | 2,391.75 | 48.91 | 4% |
| 9 | 1348 | 1,260 | 1,261 | 87 | 7,645.37 | 87.44 | 6% |
| 10 | 1086 | 1,277 | 1,313 | -227 | 51,540.29 | 227.02 | 21% |
| 11 | 1141 | 1,239 | 1,177 | -36 | 1,282.35 | 35.81 | 3% |
| 12 | 1198 | 1,220 | 1,155 | 43 | 1,821.24 | 42.68 | 4% |
| 13 | 1082 | 1,215 | 1,181 | -99 | 9,787.06 | 98.93 | 9% |
| 14 | 1344 | 1,189 | 1,122 | 222 | 49,474.29 | 222.43 | 17% |
| 15 | 1559 | 1,220 | 1,255 | 304 | 92,398.53 | 303.97 | 19% |
| 16 | 1317 | 1,288 | 1,437 | -120 | 14,498.93 | 120.41 | 9% |
| 17 | 1598 | 1,293 | 1,365 | 233 | 54,212.32 | 232.84 | 15% |
| 18 | 1567 | 1,354 | 1,505 | 62 | 3,860.65 | 62.13 | 4% |
| 19 | 1396 | 1,397 | 1,542 | -146 | 21,358.75 | 146.15 | 10% |
| 20 | 1420 | 1,397 | 1,454 | -34 | 1,187.39 | 34.46 | 2% |
| 21 | 1443 | 1,401 | 1,434 | 9 | 84.95 | 9.22 | 1% |
| 22 | 1470 | 1,410 | 1,439 | 31 | 941.67 | 30.69 | 2% |
| 23 | 1500 | 1,422 | 1,458 | 42 | 1,787.15 | 42.27 | 3% |
| 24 | 1462 | 1,437 | 1,483 | -21 | 444.79 | 21.09 | 1% |
| 25 | 1425 | 1,442 | 1,470 | -45 | 2,064.44 | 45.44 | 3% |
| 26 | 1505 | 1,439 | 1,443 | 62 | 3,822.40 | 61.83 | 4% |
| 27 | 1510 | 1,452 | 1,480 | 30 | 883.89 | 29.73 | 2% |
| 28 | 1376 | 1,464 | 1,498 | -122 | 14,910.34 | 122.11 | 9% |
| 29 | 1312 | 1,446 | 1,425 | -113 | 12,733.58 | 112.84 | 9% |
| 30 | 1253 | 1,419 | 1,357 | -104 | 10,844.57 | 104.14 | 8% |
| SEMANA 31 | | 1,386 | 1,295 | 89 | 440,718.38 | 2,900.94 | 219% |



SUAIVIZACIÓN EXPONENCIAL AJUSTADO A LA TENDENCIA

| SEMANA | D | Ft | A | T | Et | Et2 | /Et/ | E% |
|-----------|------|------|---------|------|------|-------------|-----------|------|
| 1 | 1241 | 1358 | 1287.92 | -2 | -117 | 13759.29 | 117.3 | 9% |
| 2 | 1284 | 1286 | 1284.74 | -2 | -2 | 3.400336 | 1.844 | 0% |
| 3 | 1129 | 1282 | 1190.38 | -21 | -153 | 23543.9318 | 153.44032 | 14% |
| 4 | 1325 | 1170 | 1262.87 | -2 | 155 | 24128.64857 | 155.33399 | 12% |
| 5 | 1357 | 1261 | 1318.52 | 9 | 96 | 9255.139524 | 96.203636 | 7% |
| 6 | 1171 | 1328 | 1233.8 | -9 | -157 | 24646.78398 | 156.99294 | 13% |
| 7 | 1329 | 1224 | 1287.17 | 3 | 105 | 10934.37866 | 104.56758 | 8% |
| 8 | 1241 | 1290 | 1260.74 | -3 | -49 | 2436.046463 | 49.356321 | 4% |
| 9 | 1348 | 1258 | 1312 | 8 | 90 | 8099.437841 | 89.996877 | 7% |
| 10 | 1086 | 1320 | 1179.62 | -20 | -234 | 54784.77131 | 234.06147 | 22% |
| 11 | 1141 | 1160 | 1148.44 | -22 | -19 | 345.8644457 | 18.597431 | 2% |
| 12 | 1198 | 1126 | 1169.27 | -14 | 72 | 5158.094553 | 71.819876 | 6% |
| 13 | 1082 | 1156 | 1111.45 | -22 | -74 | 5421.610542 | 73.631587 | 7% |
| 14 | 1344 | 1089 | 1241.99 | 8 | 255 | 65037.04619 | 255.02362 | 19% |
| 15 | 1559 | 1250 | 1435.45 | 45 | 309 | 95408.6254 | 308.88287 | 20% |
| 16 | 1317 | 1481 | 1382.46 | 26 | -164 | 26777.84605 | 163.63938 | 12% |
| 17 | 1598 | 1408 | 1522 | 48 | 190 | 36095.6109 | 189.98845 | 12% |
| 18 | 1567 | 1570 | 1568.34 | 48 | -3 | 11.28310658 | 3.3590336 | 0% |
| 19 | 1396 | 1616 | 1484.12 | 22 | -220 | 48529.86179 | 220.29494 | 16% |
| 20 | 1420 | 1506 | 1454.25 | 11 | -86 | 7333.167101 | 85.633913 | 6% |
| 21 | 1443 | 1465 | 1452 | 9 | -22 | 505.954478 | 22.493432 | 2% |
| 22 | 1470 | 1461 | 1466.22 | 10 | 9 | 89.52892344 | 9.4619725 | 1% |
| 23 | 1500 | 1476 | 1490.36 | 13 | 24 | 581.2292973 | 24.108698 | 2% |
| 24 | 1462 | 1503 | 1478.37 | 8 | -41 | 1674.909331 | 40.925656 | 3% |
| 25 | 1425 | 1486 | 1449.41 | 0 | -61 | 3724.455705 | 61.028319 | 4% |
| 26 | 1505 | 1450 | 1482.9 | 7 | 55 | 3053.006096 | 55.254014 | 4% |
| 27 | 1510 | 1490 | 1501.95 | 9 | 20 | 405.4772568 | 20.136466 | 1% |
| 28 | 1376 | 1511 | 1430.13 | -7 | -135 | 18313.37783 | 135.32693 | 10% |
| 29 | 1312 | 1423 | 1356.51 | -20 | -111 | 12381.69299 | 111.27306 | 8% |
| 30 | 1253 | 1336 | 1286.32 | -30 | -83 | 6938.680073 | 83.29874 | 7% |
| SEMANA 31 | | 1256 | 502.445 | -181 | -352 | 509379.15 | 3113.28 | 236% |



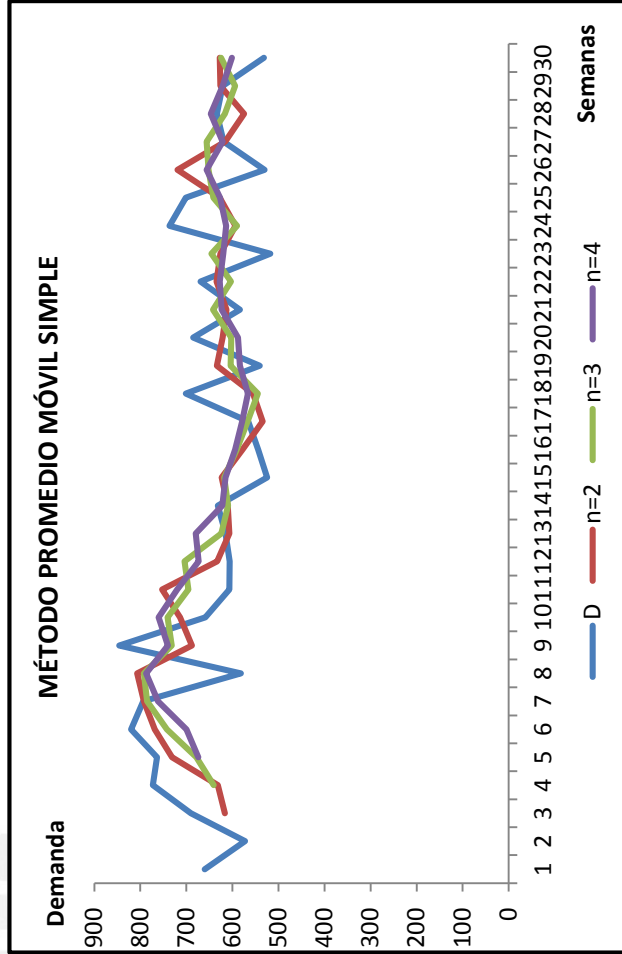
| | PM | SE $\alpha=0.6$ | SE/AT $\alpha=0.6$ |
|------|-------|--------------------|-----------------------|
| n | 28 | 29 | 30 |
| CFE | 5 | 89 | -352 |
| MSE | 16513 | 15197 | 16979 |
| IMAD | 107 | 100 | 104 |
| MAPE | 8.06% | 7.54% | 7.86% |

ATACAMA

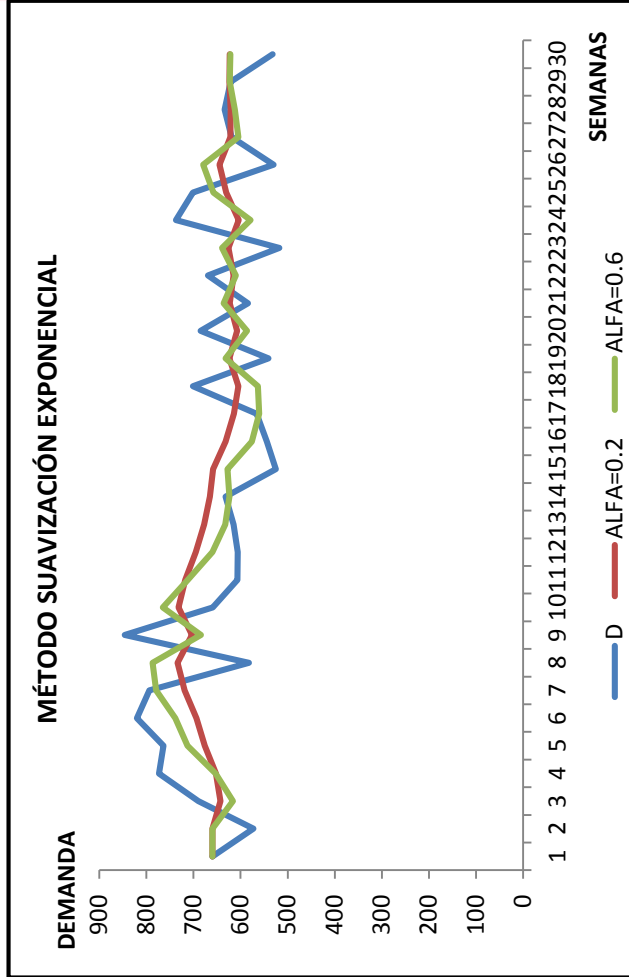
PROMEDIO MÓVIL

CV 0.14

| SEMANA | D | n=2 | n=3 | n=4 | Et | Et2 | /Et/ | Ex |
|--------|-----|-----|-----|-----|------|----------|-------|-------|
| 1 | 660 | | | | | | | |
| 2 | 573 | | | | | | | |
| 3 | 690 | 617 | | | 74 | 5402.25 | 74 | 11% |
| 4 | 773 | 632 | 641 | | 142 | 20022.25 | 142 | 18% |
| 5 | 764 | 679 | 679 | 674 | 33 | 1056.25 | 33 | 4% |
| 6 | 820 | 769 | 742 | 700 | 52 | 2652.25 | 52 | 6% |
| 7 | 794 | 792 | 786 | 762 | 2 | 4 | 2 | 0% |
| 8 | 582 | 807 | 793 | 788 | -225 | 50625 | 225 | 39% |
| 9 | 846 | 688 | 732 | 740 | 158 | 24964 | 158 | 19% |
| 10 | 659 | 714 | 741 | 761 | -55 | 3025 | 55 | 8% |
| 11 | 607 | 753 | 696 | 720 | -146 | 21170.25 | 146 | 24% |
| 12 | 606 | 633 | 704 | 674 | -27 | 729 | 27 | 4% |
| 13 | 615 | 607 | 624 | 680 | 9 | 72.25 | 9 | 1% |
| 14 | 632 | 611 | 609 | 622 | 22 | 462.25 | 22 | 3% |
| 15 | 525 | 624 | 618 | 615 | -99 | 9702.25 | 99 | 19% |
| 16 | 544 | 579 | 591 | 595 | -35 | 1190.25 | 35 | 6% |
| 17 | 566 | 535 | 567 | 579 | 32 | 992.25 | 32 | 6% |
| 18 | 701 | 555 | 545 | 567 | 146 | 21316 | 146 | 21% |
| 19 | 541 | 634 | 604 | 584 | -93 | 8556.25 | 93 | 17% |
| 20 | 685 | 621 | 603 | 588 | 64 | 4096 | 64 | 9% |
| 21 | 584 | 613 | 642 | 623 | -29 | 841 | 29 | 5% |
| 22 | 669 | 635 | 603 | 628 | 35 | 1190.25 | 35 | 5% |
| 23 | 518 | 627 | 646 | 620 | -109 | 11772.25 | 109 | 21% |
| 24 | 737 | 594 | 590 | 614 | 144 | 20592.25 | 144 | 19% |
| 25 | 701 | 628 | 641 | 627 | 74 | 5402.25 | 74 | 10% |
| 26 | 530 | 719 | 652 | 656 | -189 | 35721 | 189 | 36% |
| 27 | 619 | 616 | 656 | 622 | 4 | 12.25 | 4 | 1% |
| 28 | 634 | 575 | 617 | 647 | 60 | 3540.25 | 60 | 9% |
| 29 | 621 | 627 | 594 | 621 | -6 | 30.25 | 6 | 1% |
| 30 | 532 | 628 | 625 | 601 | -96 | 9120.25 | 96 | 18% |
| 31 | | 577 | 596 | 602 | -61 | 264.260 | 2,151 | 34.2% |

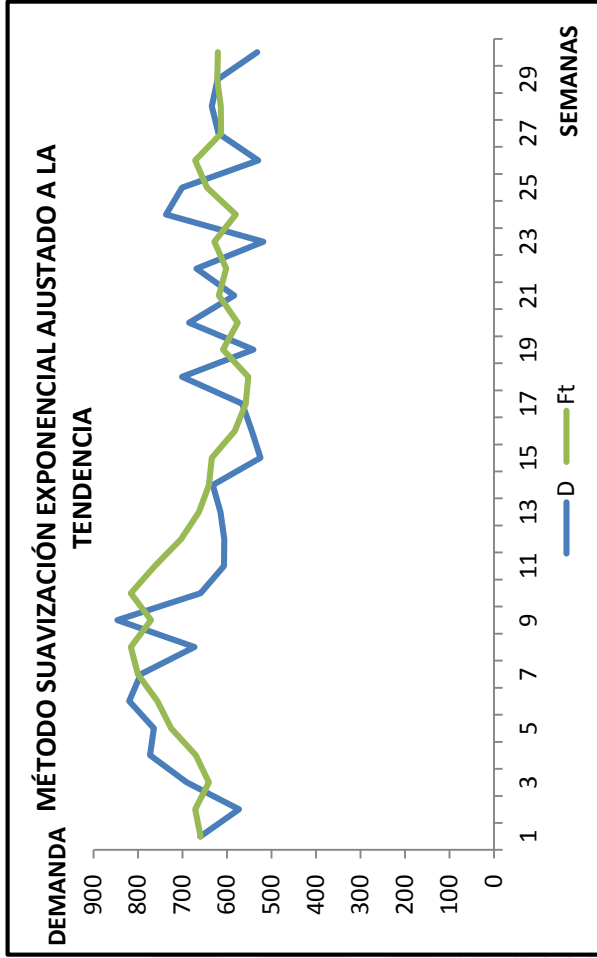


| Suavización exponencial | | | | | | | | | |
|-------------------------|-----|------|-----|------|------------|----------|------|--|--|
| SEMANA | D | ALFA | | Et | Et2 | /Et/ | E% | | |
| | | 0.2 | 0.5 | | | | | | |
| 1 | 660 | 660 | 660 | - | - | - | 0% | | |
| 2 | 573 | 660 | 660 | -87 | 7,569.00 | 87.00 | 15% | | |
| 3 | 690 | 643 | 617 | 74 | 5,402.25 | 73.50 | 11% | | |
| 4 | 773 | 652 | 653 | 120 | 14,340.06 | 119.75 | 15% | | |
| 5 | 764 | 676 | 713 | 51 | 2,588.27 | 50.88 | 7% | | |
| 6 | 820 | 694 | 739 | 81 | 6,632.07 | 81.44 | 10% | | |
| 7 | 794 | 719 | 779 | 15 | 216.64 | 14.72 | 2% | | |
| 8 | 582 | 734 | 787 | -205 | 41,877.79 | 204.64 | 35% | | |
| 9 | 846 | 704 | 684 | 162 | 26,140.32 | 161.68 | 19% | | |
| 10 | 659 | 732 | 765 | -106 | 11,269.98 | 106.16 | 16% | | |
| 11 | 607 | 717 | 712 | -105 | 11,041.82 | 105.08 | 17% | | |
| 12 | 606 | 695 | 660 | -54 | 2,866.54 | 53.54 | 9% | | |
| 13 | 615 | 678 | 633 | -18 | 315.77 | 17.77 | 3% | | |
| 14 | 632 | 665 | 624 | 8 | 65.85 | 8.11 | 1% | | |
| 15 | 525 | 658 | 628 | -103 | 10,597.16 | 102.94 | 20% | | |
| 16 | 544 | 632 | 576 | -32 | 1,054.38 | 32.47 | 6% | | |
| 17 | 566 | 614 | 560 | 6 | 33.23 | 5.76 | 1% | | |
| 18 | 701 | 605 | 563 | 138 | 19,011.50 | 137.88 | 20% | | |
| 19 | 541 | 624 | 632 | -91 | 8,291.72 | 91.06 | 17% | | |
| 20 | 685 | 607 | 587 | 98 | 9,696.45 | 98.47 | 14% | | |
| 21 | 584 | 623 | 636 | -52 | 2,679.59 | 51.76 | 9% | | |
| 22 | 669 | 615 | 610 | 59 | 3,494.89 | 59.12 | 9% | | |
| 23 | 518 | 626 | 639 | -121 | 14,747.96 | 121.44 | 23% | | |
| 24 | 737 | 604 | 579 | 158 | 25,052.37 | 158.28 | 21% | | |
| 25 | 701 | 631 | 658 | 43 | 1,861.03 | 43.14 | 6% | | |
| 26 | 530 | 645 | 679 | -149 | 22,329.37 | 149.43 | 28% | | |
| 27 | 619 | 622 | 605 | 14 | 204.06 | 14.28 | 2% | | |
| 28 | 634 | 621 | 612 | 22 | 490.29 | 22.14 | 3% | | |
| 29 | 621 | 624 | 623 | -2 | 3.72 | 1.93 | 0% | | |
| 30 | 532 | 623 | 622 | -90 | 8,093.59 | 89.96 | 17% | | |
| SEMANA 31 | | 605 | 577 | -166 | 257,967.67 | 2,264.35 | 358% | | |



SUAVIZACIÓN EXPONENCIAL AJUSTADO A LA TENDENCIA

| SEMANA | D | Ft | A | T | Et | Et2 | /Et/ | E% |
|-----------|-----|-----|---------|-----|------|--------------|-----------|------|
| 1 | 660 | 659 | 659.58 | 12 | 1 | 0.49 | 0.7 | 0% |
| 2 | 573 | 672 | 632.165 | 8 | -99 | 9723.537664 | 98.608 | 17% |
| 3 | 690 | 640 | 660.149 | 10 | 50 | 2475.213742 | 49.75152 | 7% |
| 4 | 773 | 670 | 711.334 | 14 | 103 | 10563.14692 | 102.77717 | 13% |
| 5 | 764 | 726 | 740.911 | 16 | 38 | 1480.823924 | 38.481475 | 5% |
| 6 | 820 | 757 | 781.981 | 18 | 63 | 4015.097675 | 63.364798 | 8% |
| 7 | 794 | 800 | 797.744 | 18 | -6 | 38.93509844 | 6.2397996 | 1% |
| 8 | 673 | 816 | 758.652 | 12 | -143 | 20378.4094 | 142.75297 | 21% |
| 9 | 846 | 771 | 800.97 | 15 | 75 | 5632.390263 | 75.049252 | 9% |
| 10 | 659 | 816 | 753.363 | 9 | -157 | 24734.28907 | 157.27139 | 24% |
| 11 | 607 | 762 | 700.224 | 3 | -155 | 24140.74259 | 155.37291 | 26% |
| 12 | 606 | 703 | 664.211 | -1 | -97 | 9412.669818 | 97.018915 | 16% |
| 13 | 615 | 663 | 643.875 | -3 | -48 | 2316.088607 | 48.125758 | 8% |
| 14 | 632 | 641 | 637.319 | -3 | -9 | 78.58528216 | 8.864834 | 1% |
| 15 | 525 | 634 | 590.372 | -8 | -109 | 11870.90572 | 108.95369 | 21% |
| 16 | 544 | 583 | 567.189 | -9 | -39 | 1493.733601 | 38.64885 | 7% |
| 17 | 566 | 558 | 561.152 | -9 | 8 | 65.28649325 | 8.0800058 | 1% |
| 18 | 701 | 552 | 611.724 | -3 | 149 | 22139.689884 | 148.79412 | 21% |
| 19 | 541 | 609 | 581.638 | -6 | -68 | 4587.241536 | 67.729178 | 13% |
| 20 | 685 | 576 | 619.56 | -1 | 109 | 11895.39478 | 109.06601 | 16% |
| 21 | 584 | 618 | 604.532 | -3 | -34 | 1170.975269 | 34.219516 | 6% |
| 22 | 669 | 602 | 628.693 | 0 | 67 | 4512.876765 | 67.177949 | 10% |
| 23 | 518 | 629 | 584.402 | -4 | -111 | 12248.0018 | 110.67069 | 21% |
| 24 | 737 | 580 | 642.772 | 2 | 157 | 24663.74553 | 157.04695 | 21% |
| 25 | 701 | 645 | 667.163 | 4 | 56 | 3180.470644 | 56.395662 | 8% |
| 26 | 530 | 671 | 614.751 | -2 | -141 | 19951.82803 | 141.25094 | 27% |
| 27 | 619 | 613 | 615.513 | -1 | 6 | 33.76931088 | 5.8111368 | 1% |
| 28 | 634 | 614 | 622.11 | -1 | 20 | 392.6713731 | 19.815937 | 3% |
| 29 | 621 | 622 | 621.344 | -1 | -1 | 0.329269177 | 0.5738198 | 0% |
| 30 | 532 | 621 | 585.271 | -4 | -89 | 7882.726739 | 88.784721 | 17% |
| SEMANA 31 | | 581 | 348.696 | -27 | -403 | 241080.07 | 2207.40 | 349% |

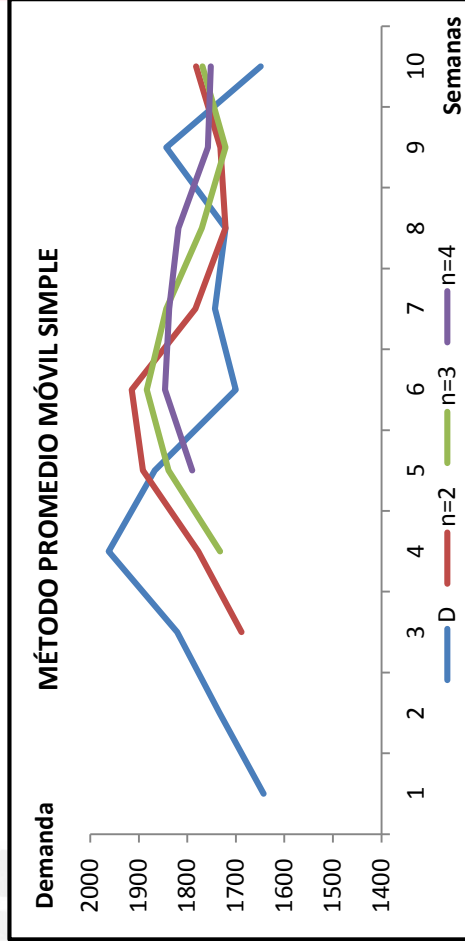


| | PM | SE | SE/AT |
|------|--------|--------|--------------|
| n | 28 | 29 | $\alpha=0.4$ |
| CFE | -61 | -166 | -403 |
| MSE | 9438 | 8895 | 8036 |
| MAD | 77 | 78 | 74 |
| MAPE | 12.22% | 12.34% | 11.64% |

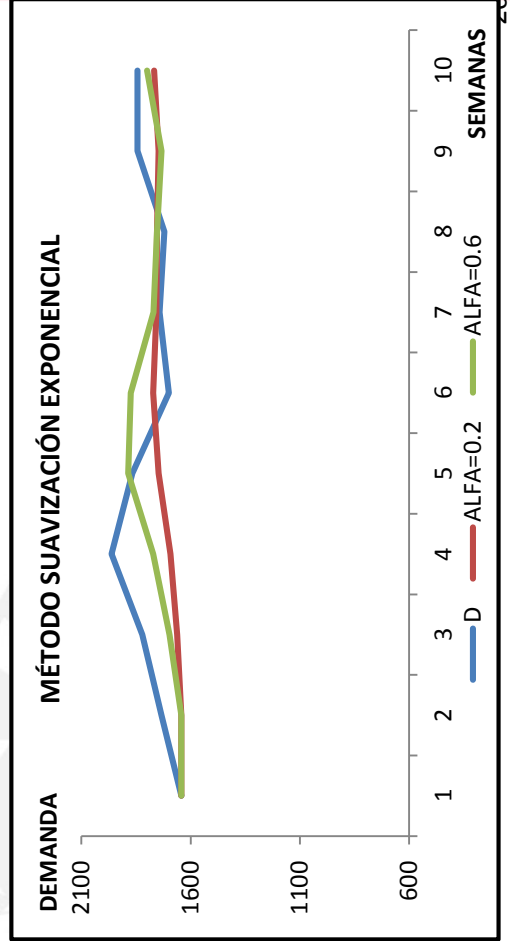
ANDES N

| PROMEDIO MÓVIL | | | | | | | | | |
|----------------|------|-------|-------|-------|------|---------|----------|-----|-----|
| SEMANA | D | n=2 | n=3 | n=4 | Et | Et2 | /Et/ | E% | |
| 1 | 1643 | | | | | | | | |
| 2 | 1734 | | | | | | | | |
| 3 | 1821 | 1,689 | | | | 133 | 17556.25 | 133 | 7% |
| 4 | 1962 | 1,778 | 1,733 | | | 185 | 34040.25 | 185 | 9% |
| 5 | 1867 | 1,892 | 1,839 | 1,790 | | -25 | 600.25 | 25 | 1% |
| 6 | 1700 | 1,915 | 1,883 | 1,846 | | -215 | 46010.25 | 215 | 13% |
| 7 | 1743 | 1,784 | 1,843 | 1,838 | | -41 | 1640.25 | 41 | 2% |
| 8 | 1721 | 1,722 | 1,770 | 1,818 | | -1 | 0.25 | 1 | 0% |
| 9 | 1843 | 1,732 | 1,721 | 1,758 | 111 | 12321 | | 111 | 6% |
| 10 | 1649 | 1,782 | 1,769 | 1,752 | -133 | 17689 | | 133 | 8% |
| 11 | | 1,746 | 1,738 | 1,739 | 15 | 129,858 | | 841 | 47% |

CV 0.06

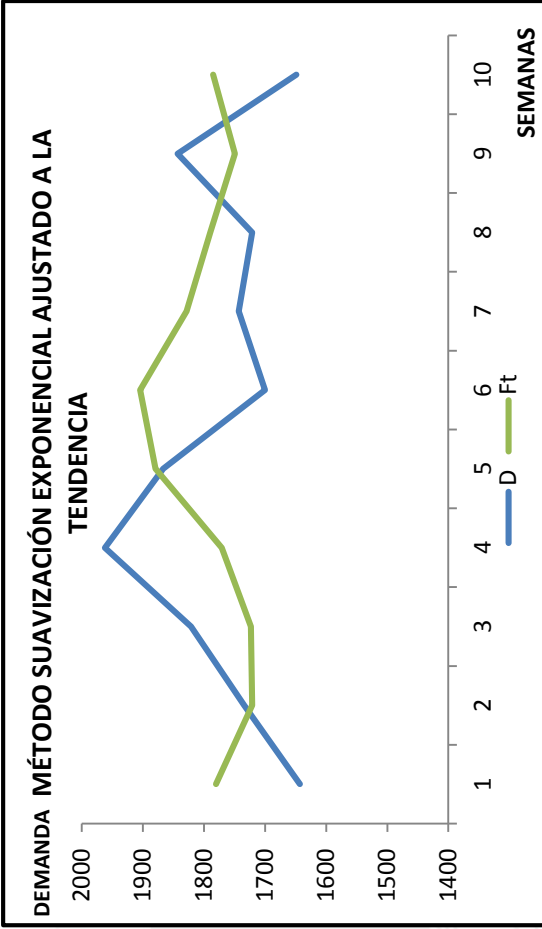


| Suavización exponencial | | | | | | | | | |
|-------------------------|------|-------|----------|------|------------|--------|-----|--|--|
| SEMANA | D | ALFA | | Et | Et2 | /Et/ | E% | | |
| | | 0.2 | 0.6 | | | | | | |
| 1 | 1643 | 1,643 | 1,643 | - | - | - | 0% | | |
| 2 | 1734 | 1,643 | 1,643 | 91 | 8,281.00 | 91.00 | 5% | | |
| 3 | 1821 | 1,661 | 1,698 | 123 | 15,227.56 | 123.40 | 7% | | |
| 4 | 1962 | 1,693 | 1,772 | 190 | 36,236.93 | 190.36 | 10% | | |
| 5 | 1867 | 1,747 | 1,886 | -19 | 355.55 | 18.86 | 1% | | |
| 6 | 1700 | 1,771 | 1,875 | -175 | 30,465.05 | 174.54 | 10% | | |
| 7 | 1743 | 1,757 | 1,770 | -27 | 719.15 | 26.82 | 2% | | |
| 8 | 1721 | 1,754 | 1,754 | -33 | 1,071.04 | 32.73 | 2% | | |
| 9 | 1843 | 1,747 | 1,734 | 109 | 11,861.23 | 108.91 | 6% | | |
| 10 | 1843 | 1,767 | 1,799 | 44 | 1,897.80 | 43.56 | 2% | | |
| SEMANA 11 | | 1,782 | 1,825.57 | 304 | 106,115.31 | 810.18 | 45% | | |



SUAVIZACIÓN EXPONENCIAL AJUSTADO A LA TENDENCIA

| SEMANA | D | Ft | A | T | Et | Et2 | /Et/ | E% |
|-----------|------|------|----------|-----|------|-------------|------------|-----|
| 1 | 1643 | 1780 | 1725.38 | -4 | -137 | 18851.29 | 137.3 | 8% |
| 2 | 1734 | 1721 | 1726.142 | -3 | 13 | 171.505216 | 13.096 | 1% |
| 3 | 1821 | 1723 | 1762.343 | 9 | 98 | 9557.424286 | 97.76208 | 5% |
| 4 | 1962 | 1771 | 1847.502 | 32 | 191 | 36416.19515 | 190.83028 | 10% |
| 5 | 1867 | 1879 | 1874.337 | 30 | -12 | 149.5346462 | 12.228436 | 1% |
| 6 | 1700 | 1905 | 1822.758 | 6 | -205 | 41859.62644 | 204.59625 | 12% |
| 7 | 1743 | 1828 | 1794.279 | -5 | -85 | 7304.333193 | 85.465392 | 5% |
| 8 | 1721 | 1790 | 1762.239 | -13 | -69 | 4723.954275 | 68.731028 | 4% |
| 9 | 1843 | 1749 | 1786.866 | -2 | 94 | 8752.970802 | 93.557313 | 5% |
| 10 | 1649 | 1785 | 1730.778 | -18 | -136 | 18576.75221 | 136.296556 | 8% |
| SEMANA 11 | | 1713 | | - | -249 | 146363.59 | 1039.86 | 59% |

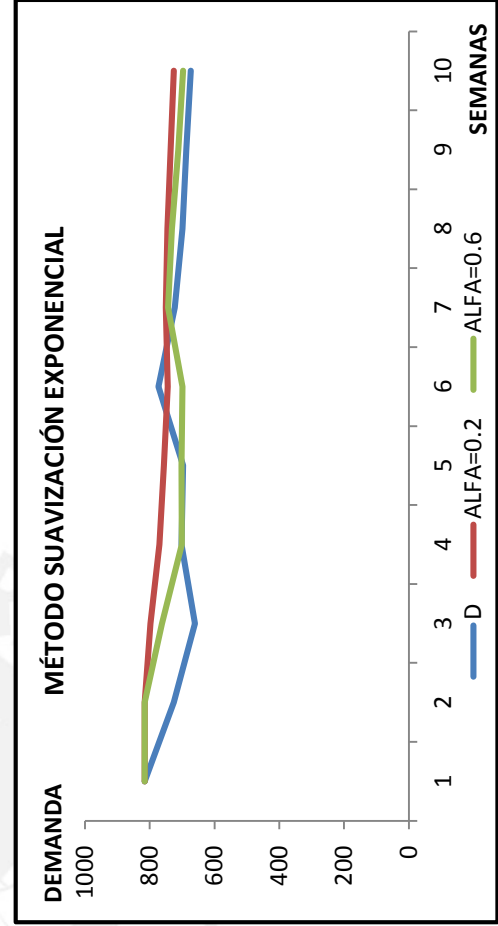
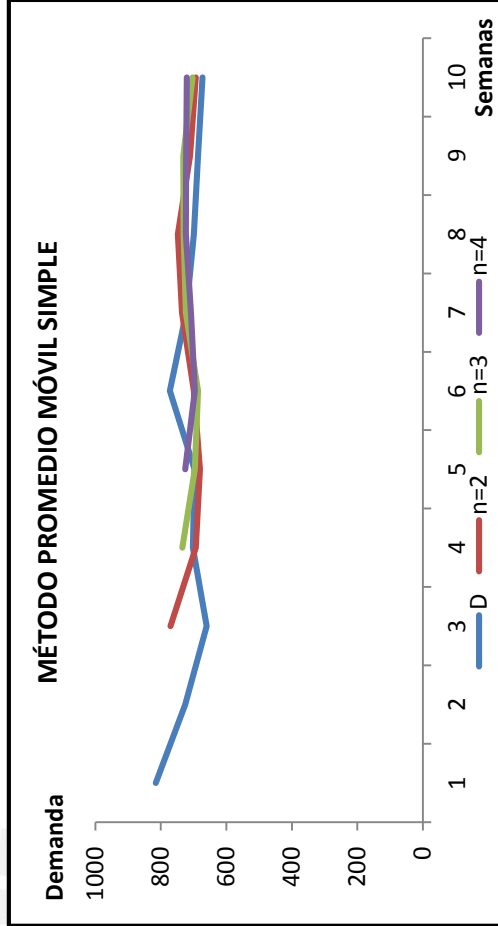


| | PM | SE $\alpha=0.6$ | SE/AT $\alpha=0.4$ |
|------|-------|--------------------|-----------------------|
| n | 8 | 9 | 10 |
| CFE | 15 | 304 | -249 |
| MSE | 16232 | 11791 | 14636 |
| MAD | 105 | 90 | 104 |
| MAPE | 5.88% | 4.97% | 5.91% |

ANDES S

| PROMEDIO MÓVIL | | | | | | | | |
|----------------|-----|-----|-----|-----|-----|------|---------|-----|
| SEMANA | D | n=2 | n=3 | n=4 | Et | Et2 | /Et/ | E% |
| 1 | 816 | | | | | | | |
| 2 | 726 | | | | | | | |
| 3 | 660 | 771 | | | | -111 | 12321 | 111 |
| 4 | 702 | 693 | 734 | | | 9 | 81 | 9 |
| 5 | 697 | 681 | 696 | 726 | 726 | 16 | 256 | 16 |
| 6 | 773 | 700 | 686 | 696 | 696 | 74 | 5402.25 | 74 |
| 7 | 723 | 735 | 724 | 708 | 708 | -12 | 144 | 12 |
| 8 | 699 | 748 | 731 | 724 | 724 | -49 | 2401 | 49 |
| 9 | 687 | 711 | 732 | 723 | 723 | -24 | 576 | 24 |
| 10 | 673 | 693 | 703 | 721 | 721 | -20 | 400 | 20 |
| SEMANA 11 | | 680 | 686 | 696 | 696 | -118 | 21,581 | 315 |

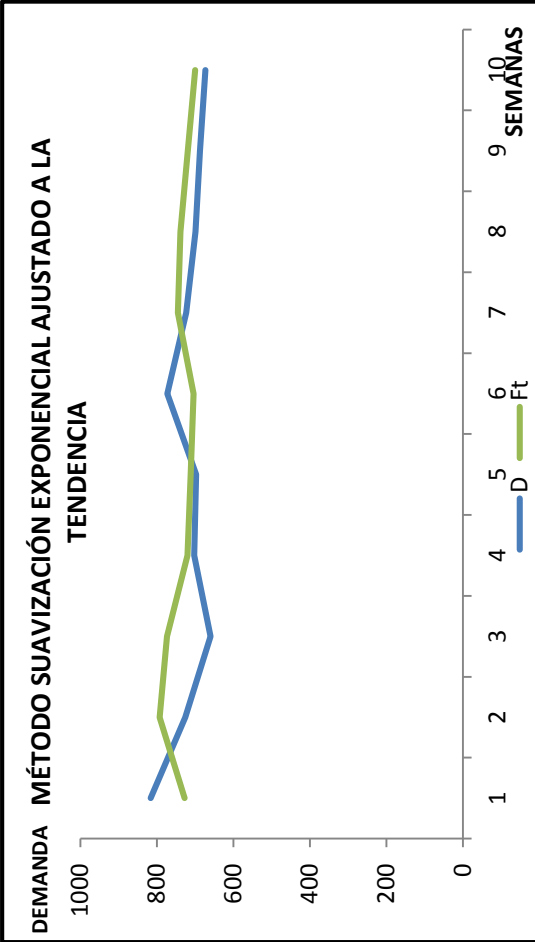
CV 0.07



| SEMANA | D | ALFA | | Et | Et2 | /Et/ | E% |
|-----------|-----|------|-----|---------|-----------|--------|------|
| | | 0.2 | 0.6 | | | | |
| 1 | 816 | 816 | 816 | - | - | - | 0% |
| 2 | 726 | 816 | 816 | -90 | 8,100.00 | 90.00 | 12% |
| 3 | 660 | 798 | 762 | -102 | 10,404.00 | 102.00 | 15% |
| 4 | 702 | 770 | 701 | 1 | 1.44 | 1.20 | 0% |
| 5 | 697 | 757 | 702 | -5 | 20.43 | 4.52 | 1% |
| 6 | 773 | 745 | 699 | 74 | 5,504.45 | 74.19 | 10% |
| 7 | 723 | 750 | 743 | -20 | 413.03 | 20.32 | 3% |
| 8 | 699 | 745 | 731 | -32 | 1,032.29 | 32.13 | 5% |
| 9 | 687 | 736 | 712 | -25 | 617.61 | 24.85 | 4% |
| 10 | 673 | 726 | 697 | -24 | 573.16 | 23.94 | 4% |
| SEMANA 31 | | 715 | 683 | -222.37 | 26,666.41 | 373.16 | 0.53 |

SUAVIZACIÓN EXPONENCIAL AJUSTADO A LA TENDENCIA

| SEMANA | D | Ft | A | T | Et | E12 | /Et/ | E% |
|-----------|-----|-----|---------|----|------|-------------|-----------|-----|
| 1 | 816 | 728 | 771.8 | 21 | 88 | 7814.56 | 88.4 | 11% |
| 2 | 726 | 793 | 759.32 | 14 | -67 | 4440.8896 | 66.64 | 9% |
| 3 | 660 | 773 | 716.748 | 3 | -113 | 12881.34202 | 113.496 | 17% |
| 4 | 702 | 720 | 710.787 | 1 | -18 | 308.8595354 | 17.5744 | 3% |
| 5 | 697 | 712 | 704.428 | 0 | -15 | 220.7054899 | 14.85616 | 2% |
| 6 | 773 | 704 | 738.506 | 6 | 69 | 4759.423619 | 68.988576 | 9% |
| 7 | 723 | 745 | 733.994 | 4 | -22 | 483.4683445 | 21.987914 | 3% |
| 8 | 699 | 738 | 718.639 | 0 | -39 | 1542.711562 | 39.277367 | 6% |
| 9 | 687 | 719 | 702.997 | -3 | -32 | 1023.638883 | 31.994357 | 5% |
| 10 | 673 | 700 | 686.577 | -6 | -27 | 737.3080199 | 27.153416 | 4% |
| SEMANA 11 | - | 681 | - | - | -176 | 34212.91 | 490.37 | 68% |



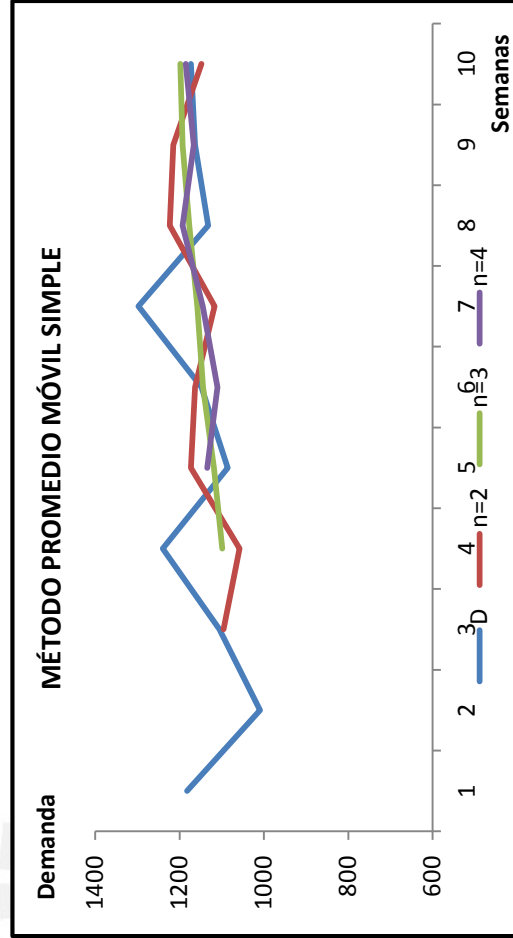
| | PM | SE | SE/AT |
|------|-------|-------|-------|
| n | 8 | 9 | 10 |
| CFE | -118 | -222 | -176 |
| MSE | 2698 | 2963 | 3421 |
| MAD | 39 | 41 | 49 |
| MAPE | 5.63% | 5.87% | 6.81% |

WLX

PROMEDIO MÓVIL

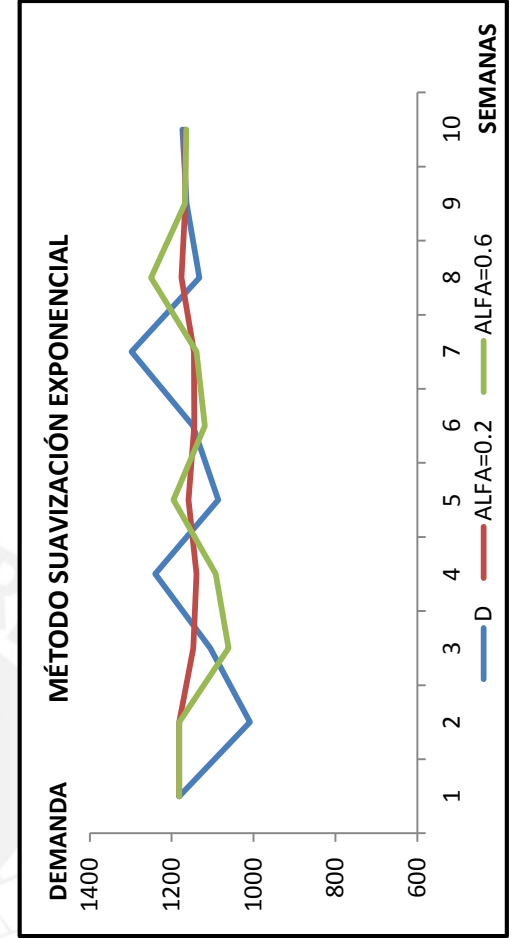
| SEMANA | D | n=2 | n=3 | n=4 | Et | Et2 | /Et/ | E% |
|--------|--------|-------|-------|-------|----|-----|-------------|---------|
| 1 | 1182 | | | | | | | |
| 2 | 1009 | | | | | | | |
| 3 | 1106 | 1,096 | | | | 11 | 110.25 | 11 1% |
| 4 | 1240 | 1,058 | 1,099 | | | 183 | 33306.25 | 183 15% |
| 5 | 1086 | 1,173 | 1,118 | 1,134 | | -87 | 7569 | 87 8% |
| 6 | 1148 | 1,163 | 1,144 | 1,110 | | -15 | 225 | 15 1% |
| 7 | 1298 | 1,117 | 1,158 | 1,145 | | 181 | 32761 | 181 14% |
| 8 | 1132.3 | 1,223 | 1,177 | 1,193 | | -91 | 8220.444444 | 91 8% |
| 9 | 1163.3 | 1,215 | 1,193 | 1,166 | | -52 | 2686.694444 | 52 4% |
| 10 | 1173.4 | 1,148 | 1,198 | 1,185 | | 26 | 655.9290123 | 26 2% |
| 11 | | 1,168 | 1,156 | 1,192 | | 155 | 85,535 | 644 54% |

CV 0.07



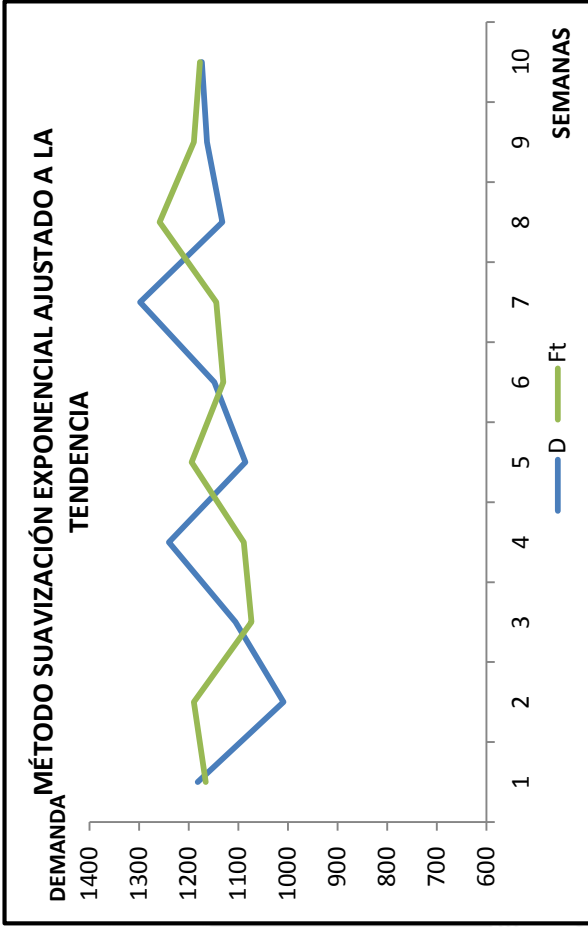
Suavización exponencial

| SEMANA | D | ALFA | | Et | Et2 | /Et/ | E% |
|-----------|--------|-------|-------|------|-----------|--------|-----|
| | | 0.2 | 0.7 | | | | |
| 1 | 1182 | 1,182 | 1,182 | - | - | - | 0% |
| 2 | 1009 | 1,182 | 1,182 | -173 | 29,929.00 | 173.00 | 17% |
| 3 | 1106 | 1,147 | 1,061 | 45 | 2,034.01 | 45.10 | 4% |
| 4 | 1240 | 1,139 | 1,092 | 148 | 21,765.10 | 147.53 | 12% |
| 5 | 1086 | 1,159 | 1,196 | -110 | 12,043.09 | 109.74 | 10% |
| 6 | 1148 | 1,145 | 1,119 | 29 | 845.51 | 29.08 | 3% |
| 7 | 1298 | 1,145 | 1,139 | 159 | 25,193.09 | 158.72 | 12% |
| 8 | 1132.3 | 1,176 | 1,250 | -118 | 13,935.73 | 118.05 | 10% |
| 9 | 1163.3 | 1,167 | 1,168 | -4 | 19.49 | 4.41 | 0% |
| 10 | 1173.4 | 1,166 | 1,165 | 9 | 77.21 | 8.79 | 1% |
| SEMANA 31 | | 1,168 | 1,171 | -16 | 105,842 | 794 | 70% |



SUAVIZACIÓN EXPONENCIAL AJUSTADO A LA TENDENCIA

| SEMANA | D | Ft | A | T | Et | Et2 | /Et/ | E% |
|-----------|--------|------|---------|----|------|-------------|-----------|-----|
| 1 | 1182 | 1166 | 1175.52 | 14 | 16 | 262.0801235 | 16.188889 | 1% |
| 2 | 1009 | 1189 | 1081.19 | -8 | -180 | 32568.37819 | 180.46711 | 18% |
| 3 | 1106 | 1073 | 1092.99 | -4 | 33 | 1057.975949 | 32.526542 | 3% |
| 4 | 1240 | 1089 | 1179.67 | 14 | 151 | 22746.91929 | 150.82082 | 12% |
| 5 | 1086 | 1194 | 1129.18 | 1 | -108 | 11655.35495 | 107.95997 | 10% |
| 6 | 1148 | 1131 | 1141.01 | 3 | 17 | 305.652212 | 17.482912 | 2% |
| 7 | 1298 | 1144 | 1236.58 | 22 | 154 | 23581.32318 | 153.56212 | 12% |
| 8 | 1132.3 | 1258 | 1182.77 | 7 | -126 | 15901.29176 | 126.10032 | 11% |
| 9 | 1163.3 | 1189 | 1173.8 | 4 | -26 | 684.6906591 | 26.166594 | 2% |
| 10 | 1173.4 | 1177 | 1175.02 | 3 | -4 | 15.53936365 | 3.942 | 0% |
| SEMANA 31 | | 1178 | | 0 | -74 | 108779 | 815 | 71% |

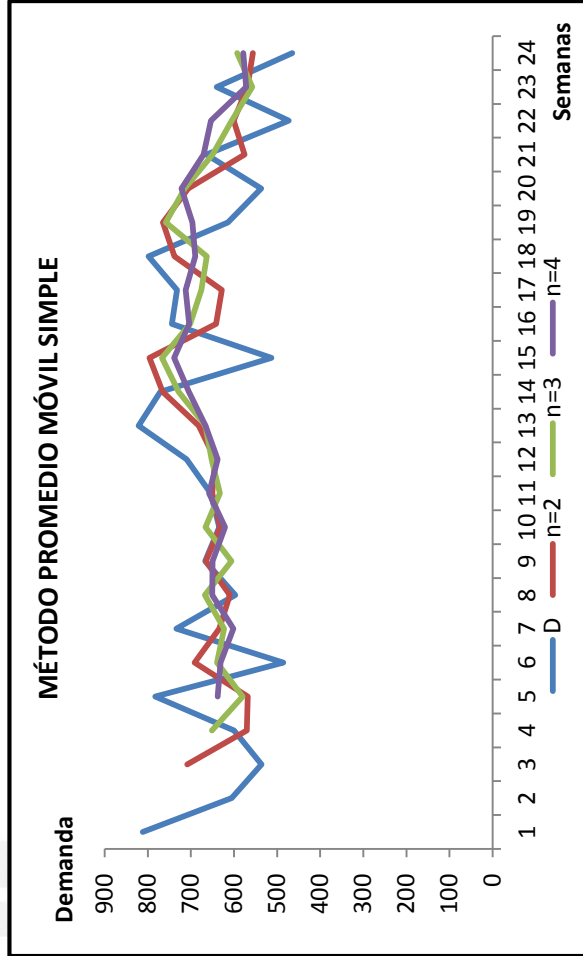


| | PM | SE | SE/AT |
|------|-------|-------|-------|
| n | 8 | 9 | 10 |
| CFE | 155 | -16 | -74 |
| MSE | 10692 | 11760 | 10878 |
| MAD | 81 | 88 | 82 |
| MAPE | 6.70% | 7.73% | 7.14% |

USECN

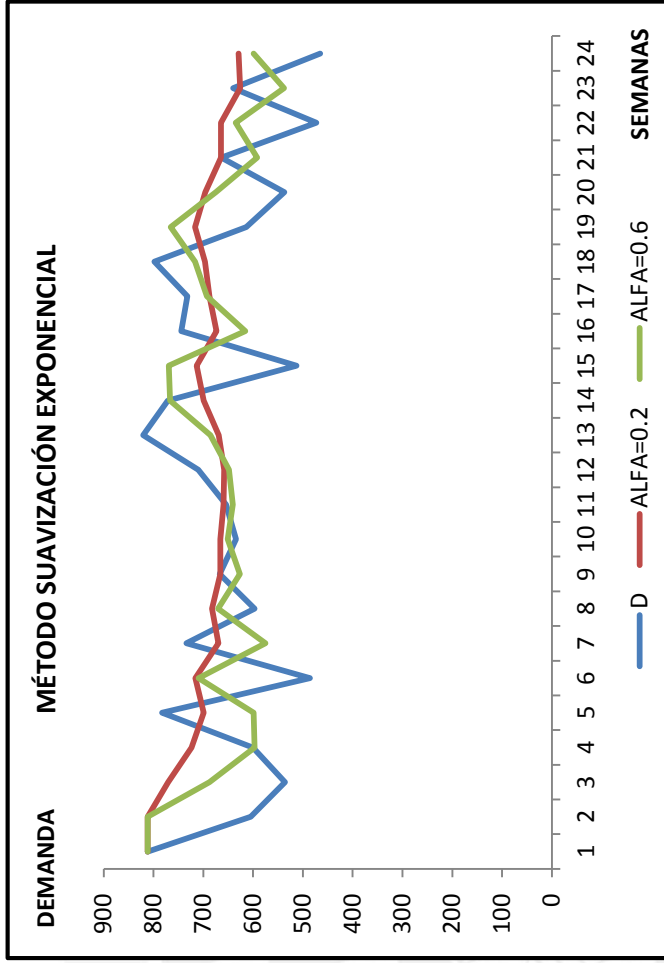
| PROMEDIO MÓVIL | | | | | | | | | |
|----------------|-----|-----|-----|-----|----|------|----------|-------|------|
| SEMANA | D | n=2 | n=3 | n=4 | Et | Et2 | /Et/ | E% | |
| 1 | 812 | | | | | | | | |
| 2 | 605 | | | | | | | | |
| 3 | 536 | 709 | | | | -173 | 29756.25 | 173 | 32% |
| 4 | 600 | 571 | 651 | | | 30 | 870.25 | 30 | 5% |
| 5 | 783 | 568 | 580 | 638 | | 215 | 46225 | 215 | 27% |
| 6 | 486 | 692 | 640 | 631 | | -206 | 42230.25 | 206 | 42% |
| 7 | 734 | 635 | 623 | 601 | | 100 | 9900.25 | 100 | 14% |
| 8 | 597 | 610 | 668 | 651 | | -13 | 169 | 13 | 2% |
| 9 | 667 | 666 | 606 | 650 | | 2 | 2.25 | 2 | 0% |
| 10 | 634 | 632 | 666 | 621 | | 2 | 4 | 2 | 0% |
| 11 | 654 | 651 | 633 | 658 | | 4 | 12.25 | 4 | 1% |
| 12 | 710 | 644 | 652 | 638 | | 66 | 4356 | 66 | 9% |
| 13 | 821 | 682 | 666 | 666 | | 139 | 19321 | 139 | 17% |
| 14 | 771 | 766 | 728 | 705 | | 6 | 30.25 | 6 | 1% |
| 15 | 513 | 796 | 767 | 739 | | -283 | 80089 | 283 | 55% |
| 16 | 744 | 642 | 702 | 704 | | 102 | 10404 | 102 | 14% |
| 17 | 732 | 629 | 676 | 712 | | 104 | 10712.25 | 104 | 14% |
| 18 | 798 | 738 | 663 | 690 | | 60 | 3600 | 60 | 8% |
| 19 | 614 | 765 | 758 | 697 | | -151 | 22801 | 151 | 25% |
| 20 | 537 | 706 | 715 | 722 | | -169 | 28561 | 169 | 31% |
| 21 | 664 | 576 | 650 | 670 | | 89 | 7832.25 | 89 | 13% |
| 22 | 473 | 601 | 605 | 653 | | -128 | 16256.25 | 128 | 27% |
| 23 | 640 | 569 | 558 | 572 | | 72 | 5112.25 | 72 | 11% |
| 24 | 465 | 557 | 592 | 579 | | -92 | 8372.25 | 92 | 20% |
| 25 | | 553 | 526 | 561 | | -226 | 346.617 | 2,200 | 368% |

CV 0.17



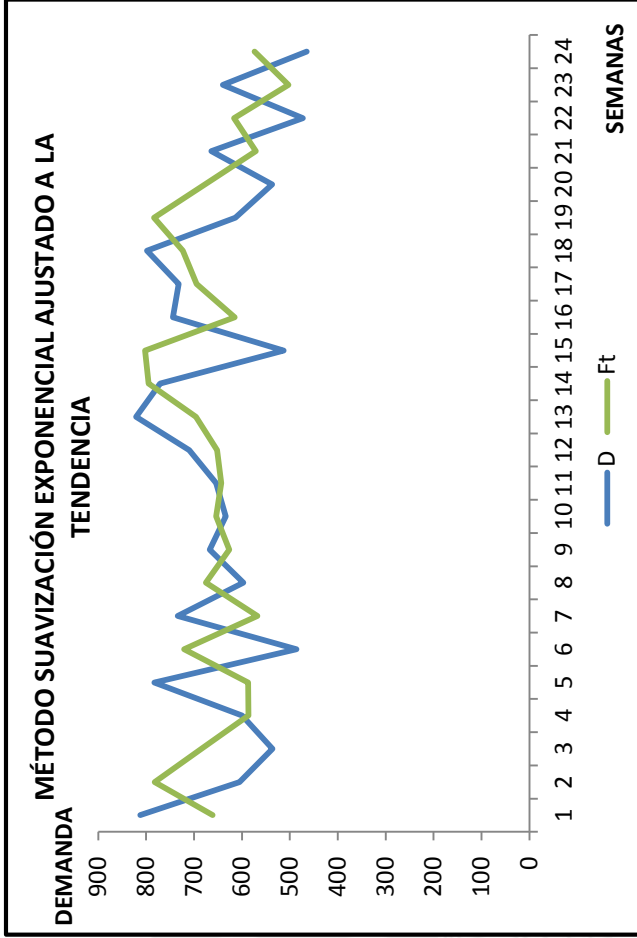
Suavización exponencial

| SEMANA | D | ALFA | | Et | Et2 | /Et/ | E% |
|-----------|-----|------|-----|------|-----------|--------|------|
| | | 0.2 | 0.6 | | | | |
| 1 | 812 | 812 | 812 | - | - | - | 0% |
| 2 | 605 | 812 | 812 | -207 | 42,849.00 | 207.00 | 34% |
| 3 | 536 | 771 | 688 | -152 | 23,043.24 | 151.80 | 28% |
| 4 | 600 | 724 | 597 | 3 | 10.76 | 3.28 | 1% |
| 5 | 783 | 699 | 599 | 184 | 33,970.91 | 184.31 | 24% |
| 6 | 486 | 716 | 709 | -223 | 49,851.81 | 223.28 | 46% |
| 7 | 734 | 670 | 575 | 159 | 25,182.49 | 158.69 | 22% |
| 8 | 597 | 683 | 671 | -74 | 5,405.78 | 73.52 | 12% |
| 9 | 667 | 666 | 626 | 41 | 1,647.58 | 40.59 | 6% |
| 10 | 634 | 666 | 651 | -17 | 281.03 | 16.76 | 3% |
| 11 | 654 | 659 | 641 | 13 | 176.74 | 13.29 | 2% |
| 12 | 710 | 658 | 649 | 61 | 3,759.87 | 61.32 | 9% |
| 13 | 821 | 669 | 685 | 136 | 18,367.60 | 135.53 | 17% |
| 14 | 771 | 699 | 767 | 4 | 17.73 | 4.21 | 1% |
| 15 | 513 | 714 | 769 | -256 | 65,697.72 | 256.32 | 50% |
| 16 | 744 | 673 | 616 | 128 | 16,505.50 | 128.47 | 17% |
| 17 | 732 | 688 | 693 | 39 | 1,551.53 | 39.39 | 5% |
| 18 | 798 | 696 | 716 | 82 | 6,684.01 | 81.76 | 10% |
| 19 | 614 | 717 | 765 | -151 | 22,890.99 | 151.30 | 25% |
| 20 | 537 | 696 | 675 | -138 | 18,911.50 | 137.52 | 26% |
| 21 | 664 | 664 | 592 | 72 | 5,182.90 | 71.99 | 11% |
| 22 | 473 | 664 | 635 | -162 | 26,309.83 | 162.20 | 34% |
| 23 | 640 | 626 | 538 | 102 | 10,428.25 | 102.12 | 16% |
| 24 | 465 | 629 | 599 | -134 | 17,996.89 | 134.15 | 29% |
| SEMANA 31 | | 596 | 519 | -489 | 396,724 | 2,539 | 426% |



SUAVIZACIÓN EXPONENCIAL AJUSTADO A LA TENDENCIA

| SEMANA | D | Ft | A | T | Et | Et2 | /Et/ | E% |
|-----------|-----|-----|---------|-----|--------------|-------------|-----------|------|
| 1 | 812 | 662 | 751.833 | 30 | 150 | 22625.17361 | 150.41667 | 19% |
| 2 | 605 | 782 | 675.753 | 9 | -177 | 31287.71361 | 176.88333 | 29% |
| 3 | 536 | 685 | 595.431 | -9 | -149 | 22075.22398 | 148.57733 | 28% |
| 4 | 600 | 586 | 594.57 | -7 | 14 | 184.2628874 | 13.574347 | 2% |
| 5 | 783 | 587 | 704.678 | 16 | 196 | 38340.02765 | 195.8061 | 25% |
| 6 | 486 | 721 | 579.919 | -12 | -235 | 55130.07001 | 234.79793 | 48% |
| 7 | 734 | 568 | 667.546 | 8 | 166 | 27601.23865 | 166.13621 | 23% |
| 8 | 597 | 675 | 628.371 | -2 | -78 | 6150.713343 | 78.426484 | 13% |
| 9 | 667 | 627 | 650.936 | 3 | 40 | 1612.794985 | 40.159619 | 6% |
| 10 | 634 | 654 | 642.09 | 1 | -20 | 409.0544441 | 20.225094 | 3% |
| 11 | 654 | 643 | 649.581 | 2 | 11 | 122.0590026 | 11.048032 | 2% |
| 12 | 710 | 652 | 686.707 | 9 | 58 | 3390.909716 | 58.231518 | 8% |
| 13 | 821 | 696 | 770.953 | 24 | 125 | 15654.29639 | 125.11713 | 15% |
| 14 | 771 | 795 | 780.657 | 21 | -24 | 582.8689979 | 24.14268 | 3% |
| 15 | 513 | 802 | 628.58 | -13 | -289 | 83491.80354 | 288.94948 | 56% |
| 16 | 744 | 615 | 692.479 | 2 | 129 | 16589.88672 | 128.80173 | 17% |
| 17 | 732 | 695 | 717.022 | 7 | 37 | 1402.203875 | 37.446013 | 5% |
| 18 | 798 | 724 | 768.236 | 15 | 74 | 5536.87827 | 74.410203 | 9% |
| 19 | 614 | 784 | 681.893 | -5 | -170 | 28809.40862 | 169.73335 | 28% |
| 20 | 537 | 677 | 593.009 | -22 | -140 | 19606.3743 | 140.02276 | 26% |
| 21 | 664 | 571 | 626.934 | -11 | 93 | 8586.654142 | 92.664201 | 14% |
| 22 | 473 | 616 | 530.352 | -28 | -143 | 20558.03011 | 143.38072 | 30% |
| 23 | 640 | 503 | 585.037 | -11 | 137 | 18880.68403 | 137.407 | 21% |
| 24 | 465 | 574 | 508.507 | -24 | -109 | 11830.20618 | 108.76675 | 23% |
| SEMANA 31 | | 484 | | - | -302.6871527 | 440458.5371 | 2765.1247 | 455% |

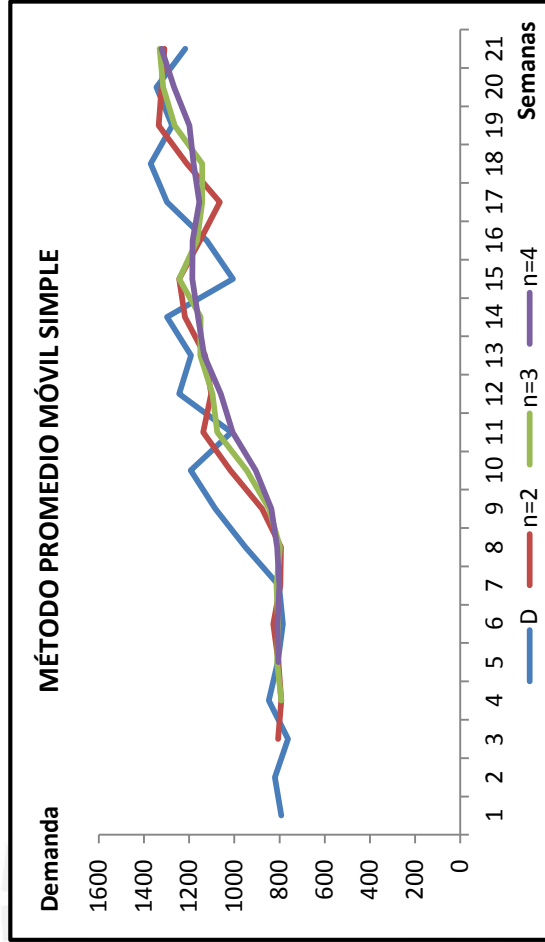


| | PM | SE | SE/AT |
|------|--------|--------|------------------------|
| n | 22 | 23 | $\alpha=0.6 \beta=0.2$ |
| CFE | -226 | -489 | 24 |
| MSE | 15755 | 17249 | -303 |
| MAD | 100 | 110 | 18352 |
| MAPE | 16.74% | 18.52% | 115 |
| | | | 18.97% |

USECS

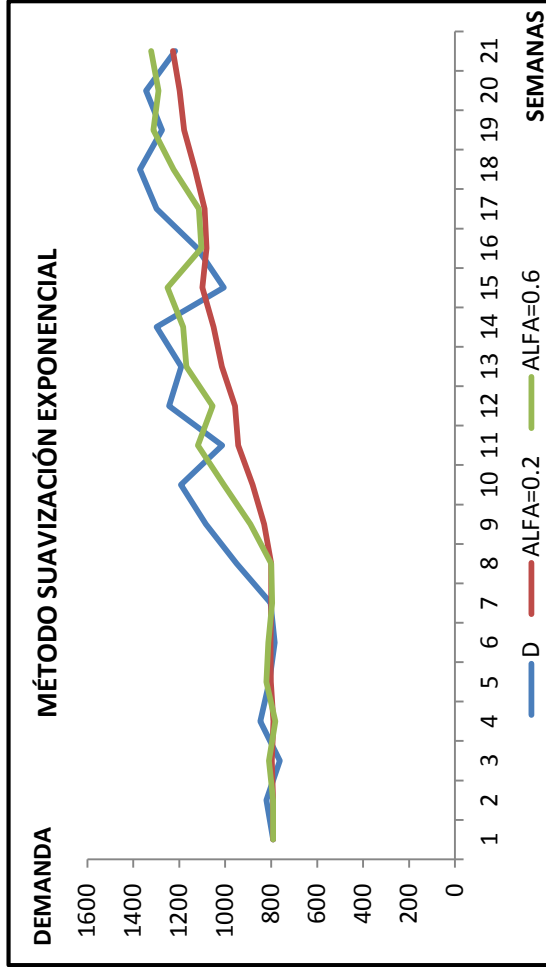
| PROMEDIO MÓVIL | | | | | | | | | |
|----------------|------|-------|-------|-------|-------|----------|------|-------|------|
| SEMANA | D | n=2 | n=3 | n=4 | Et | ET2 | /Et/ | E% | |
| 1 | 792 | | | | | | | | |
| 2 | 821 | | | | 821 | 674041 | | 821 | 100% |
| 3 | 763 | 807 | | | -44 | 1892.25 | | 44 | 6% |
| 4 | 847 | 792 | 792 | | 55 | 3025 | | 55 | 6% |
| 5 | 808 | 805 | 810 | 806 | 3 | 9 | | 3 | 0% |
| 6 | 785 | 828 | 806 | 810 | -43 | 1806.25 | | 43 | 5% |
| 7 | 803 | 797 | 813 | 801 | 7 | 42.25 | | 7 | 1% |
| 8 | 951 | 794 | 799 | 811 | 157 | 24649 | | 157 | 17% |
| 9 | 1084 | 877 | 846 | 837 | 207 | 42849 | | 207 | 19% |
| 10 | 1193 | 1,018 | 946 | 906 | 176 | 30800.25 | | 176 | 15% |
| 11 | 1013 | 1,139 | 1,076 | 1,008 | -126 | 15750.25 | | 126 | 12% |
| 12 | 1245 | 1,103 | 1,097 | 1,060 | 142 | 20164 | | 142 | 11% |
| 13 | 1192 | 1,129 | 1,150 | 1,134 | 63 | 3969 | | 63 | 5% |
| 14 | 1298 | 1,219 | 1,150 | 1,161 | 80 | 6320.25 | | 80 | 6% |
| 15 | 1006 | 1,245 | 1,245 | 1,187 | -239 | 57121 | | 239 | 24% |
| 16 | 1122 | 1,152 | 1,165 | 1,185 | -30 | 900 | | 30 | 3% |
| 17 | 1298 | 1,064 | 1,142 | 1,155 | 234 | 54756 | | 234 | 18% |
| 18 | 1371 | 1,210 | 1,142 | 1,181 | 161 | 25921 | | 161 | 12% |
| 19 | 1275 | 1,335 | 1,264 | 1,199 | -60 | 3540.25 | | 60 | 5% |
| 20 | 1345 | 1,323 | 1,315 | 1,267 | 22 | 484 | | 22 | 2% |
| 21 | 1218 | 1,310 | 1,330 | 1,322 | -92 | 8464 | | 92 | 8% |
| 31 | | 1,282 | 1,279 | 1,302 | 1,495 | 976,504 | | 2,759 | 274% |

CV 0.20



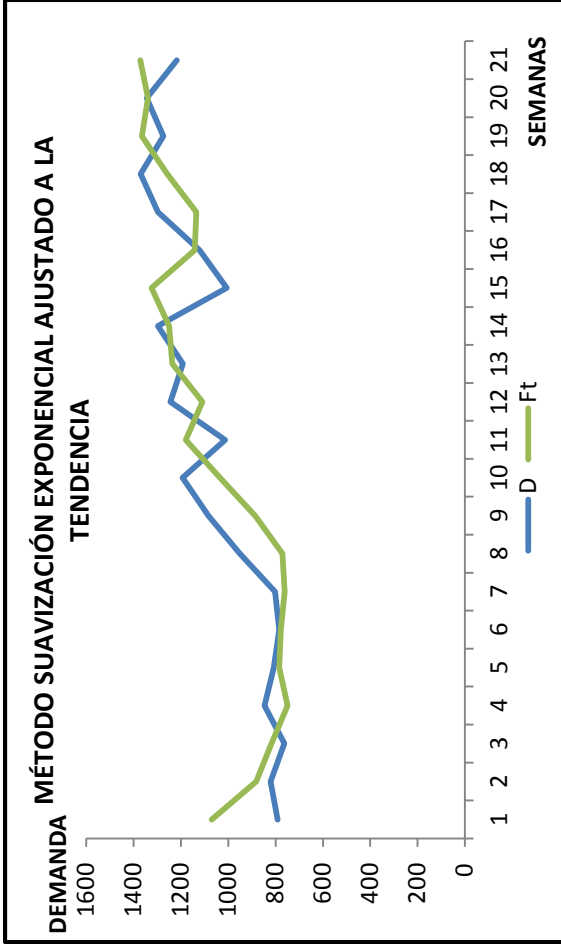
Suavización exponencial

| SEMANA | D | ALFA | | Et | Et2 | /Et/ | E% |
|-----------|------|-------|-------|------|-----------|--------|-----|
| | | 0.2 | 0.6 | | | | |
| 1 | 792 | 792 | 792 | - | - | - | 0% |
| 2 | 821 | 792 | 792 | 29 | 841.00 | 29.00 | 4% |
| 3 | 763 | 798 | 809 | -46 | 2,152.96 | 46.40 | 6% |
| 4 | 847 | 791 | 782 | 65 | 4,282.39 | 65.44 | 8% |
| 5 | 808 | 802 | 821 | -13 | 164.45 | 12.82 | 2% |
| 6 | 785 | 803 | 813 | -28 | 791.27 | 28.13 | 4% |
| 7 | 803 | 800 | 796 | 7 | 45.54 | 6.75 | 1% |
| 8 | 951 | 800 | 800 | 151 | 22,710.27 | 150.70 | 16% |
| 9 | 1084 | 830 | 891 | 193 | 37,357.04 | 193.28 | 18% |
| 10 | 1193 | 881 | 1,007 | 186 | 34,712.12 | 186.31 | 16% |
| 11 | 1013 | 944 | 1,118 | -105 | 11,125.03 | 105.48 | 10% |
| 12 | 1245 | 957 | 1,055 | 190 | 36,027.80 | 189.81 | 15% |
| 13 | 1192 | 1,015 | 1,169 | 23 | 525.51 | 22.92 | 2% |
| 14 | 1298 | 1,050 | 1,183 | 115 | 13,264.03 | 115.17 | 9% |
| 15 | 1006 | 1,100 | 1,252 | -246 | 60,482.63 | 245.93 | 24% |
| 16 | 1122 | 1,081 | 1,104 | 18 | 310.72 | 17.63 | 2% |
| 17 | 1298 | 1,089 | 1,115 | 183 | 33,507.61 | 183.05 | 14% |
| 18 | 1371 | 1,131 | 1,225 | 146 | 21,380.39 | 146.22 | 11% |
| 19 | 1275 | 1,179 | 1,313 | -38 | 1,407.14 | 37.51 | 3% |
| 20 | 1345 | 1,198 | 1,290 | 55 | 3,024.48 | 55.00 | 4% |
| 21 | 1218 | 1,228 | 1,323 | -105 | 11,025.40 | 105.00 | 9% |
| SEMANA 31 | | 1,226 | 1,260 | 780 | 295,138 | 1,943 | 2 |



SUAVIZACIÓN EXPONENCIAL AJUSTADO A LA TENDENCIA

| SEMANA | D | Ft | A | T | Et | Et2 | Et/ | E% |
|-----------|------|------|---------|-----|------|-------------|-----------|------|
| 1 | 792 | 1071 | 903.429 | -21 | -21 | 77602.04082 | 278.57143 | 35% |
| 2 | 821 | 882 | 845.4 | -29 | -29 | -61 | 3721 | 61 |
| 3 | 763 | 817 | 784.461 | -35 | -35 | 2878.475788 | 53.651429 | 7% |
| 4 | 847 | 749 | 807.91 | -23 | 98 | 9550.404582 | 97.726171 | 12% |
| 5 | 808 | 784 | 798.58 | -21 | 24 | 554.6058374 | 23.550071 | 3% |
| 6 | 785 | 778 | 782.179 | -20 | 7 | 49.75358509 | 7.0536221 | 1% |
| 7 | 803 | 762 | 786.757 | -15 | 41 | 1649.059042 | 40.608608 | 5% |
| 8 | 951 | 772 | 879.337 | 7 | 179 | 32097.43466 | 179.15757 | 19% |
| 9 | 1084 | 886 | 1004.77 | 30 | 198 | 39234.99138 | 198.07825 | 18% |
| 10 | 1193 | 1035 | 1129.85 | 49 | 158 | 24925.18711 | 157.87713 | 13% |
| 11 | 1013 | 1179 | 1079.46 | 29 | -166 | 27605.34936 | 166.14858 | 16% |
| 12 | 1245 | 1109 | 1190.53 | 46 | 136 | 18544.71238 | 136.17897 | 11% |
| 13 | 1192 | 1236 | 1209.69 | 40 | -44 | 1956.424315 | 44.231486 | 4% |
| 14 | 1298 | 1250 | 1278.84 | 46 | 48 | 2295.57026 | 47.91211 | 4% |
| 15 | 1006 | 1325 | 1133.59 | 8 | -319 | 101748.18 | 318.97991 | 32% |
| 16 | 1122 | 1141 | 1129.78 | 6 | -19 | 378.6574557 | 19.459123 | 2% |
| 17 | 1298 | 1135 | 1232.93 | 25 | 163 | 26466.17661 | 162.68429 | 13% |
| 18 | 1371 | 1258 | 1325.79 | 39 | 113 | 12773.41506 | 113.01953 | 8% |
| 19 | 1275 | 1364 | 1310.76 | 28 | -89 | 7993.91752 | 89.408711 | 7% |
| 20 | 1345 | 1339 | 1342.46 | 29 | 6 | 40.3102698 | 6.3490369 | 0% |
| 21 | 1218 | 1371 | 1279.24 | 10 | -153 | 23442.59509 | 153.10975 | 13% |
| SEMANA 31 | | 1290 | - | - | -14 | 415508 | 2355 | 229% |

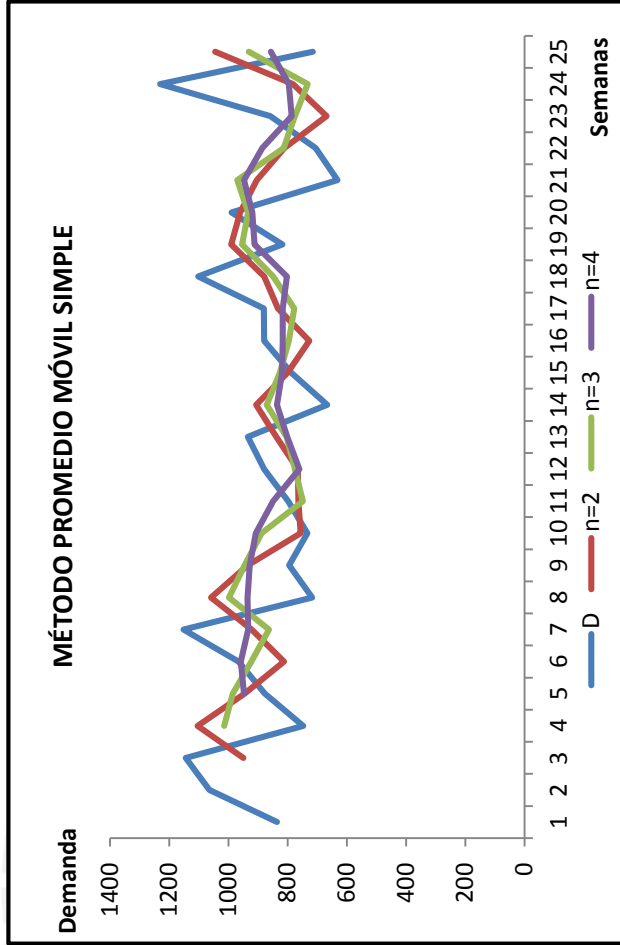


| | PM | SE | SE/AT |
|------|--------|-------|------------------------|
| n | 19 | 20 | $\alpha=0.6 \beta=0.2$ |
| CFE | 1495 | 780 | -14 |
| MSE | 51395 | 14757 | 19786 |
| MAD | 145 | 97 | 112 |
| MAPE | 14.44% | 8.78% | 10.92% |

WSA 2

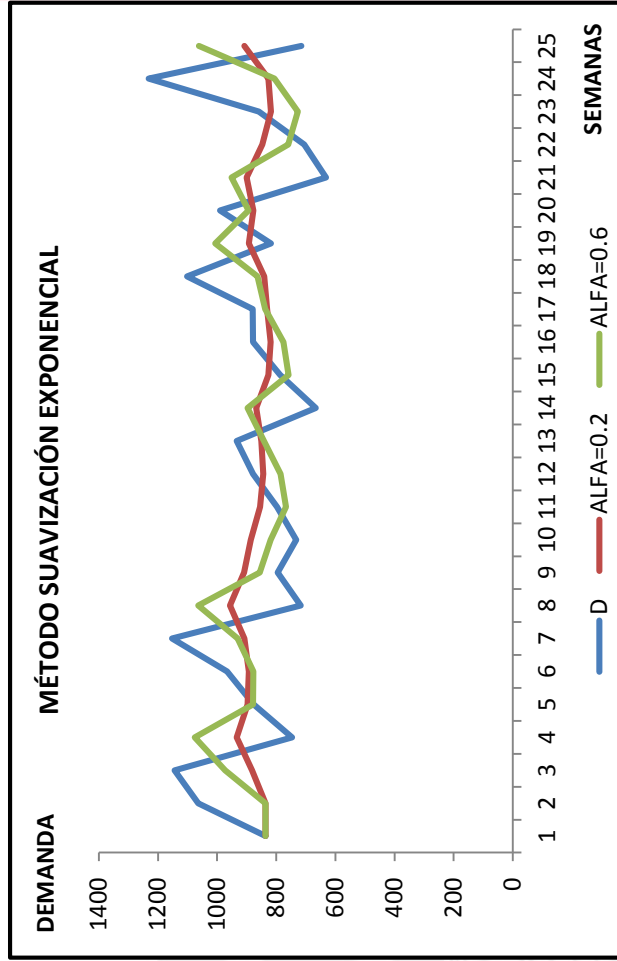
| PROMEDIO MÓVIL | | | | | | | | |
|----------------|------|-------|-------|-----|------|-----------------|-------|------|
| SEMANA | D | n=2 | n=3 | n=4 | Et | Et ² | /Et/ | E% |
| 1 | 836 | | | | | | | |
| 2 | 1064 | | | | | | | |
| 3 | 1144 | 950 | | | 194 | 37636 | 194 | 17% |
| 4 | 747 | 1,104 | 1,015 | | -357 | 127449 | 357 | 48% |
| 5 | 877 | 946 | 985 | 948 | -69 | 4692.25 | 69 | 8% |
| 6 | 966 | 812 | 923 | 958 | 154 | 23716 | 154 | 16% |
| 7 | 1152 | 922 | 863 | 934 | 231 | 53130.25 | 231 | 20% |
| 8 | 717 | 1,059 | 998 | 936 | -342 | 116964 | 342 | 48% |
| 9 | 795 | 935 | 945 | 928 | -140 | 19460.25 | 140 | 18% |
| 10 | 733 | 756 | 888 | 908 | -23 | 529 | 23 | 3% |
| 11 | 798 | 764 | 748 | 849 | 34 | 1156 | 34 | 4% |
| 12 | 879 | 766 | 775 | 761 | 114 | 12882.25 | 114 | 13% |
| 13 | 934 | 839 | 803 | 801 | 96 | 9120.25 | 96 | 10% |
| 14 | 666 | 907 | 870 | 836 | -241 | 57840.25 | 241 | 36% |
| 15 | 787 | 800 | 826 | 819 | -13 | 169 | 13 | 2% |
| 16 | 879 | 727 | 796 | 817 | 153 | 23256.25 | 153 | 17% |
| 17 | 880 | 833 | 777 | 817 | 47 | 2209 | 47 | 5% |
| 18 | 1102 | 880 | 849 | 803 | 223 | 49506.25 | 223 | 20% |
| 19 | 818 | 991 | 954 | 912 | -173 | 29929 | 173 | 21% |
| 20 | 990 | 960 | 933 | 920 | 30 | 900 | 30 | 3% |
| 21 | 632 | 904 | 970 | 948 | -272 | 73984 | 272 | 43% |
| 22 | 705 | 811 | 813 | 886 | -106 | 11236 | 106 | 15% |
| 23 | 859 | 669 | 776 | 786 | 191 | 36290.25 | 191 | 22% |
| 24 | 1231 | 782 | 732 | 797 | 449 | 201601 | 449 | 36% |
| 25 | 715 | 1,045 | 932 | 857 | -330 | 108900 | 330 | 46% |
| 26 | | 973 | 935 | 878 | -152 | 1,002,556 | 3,978 | 472% |

CV 0.19



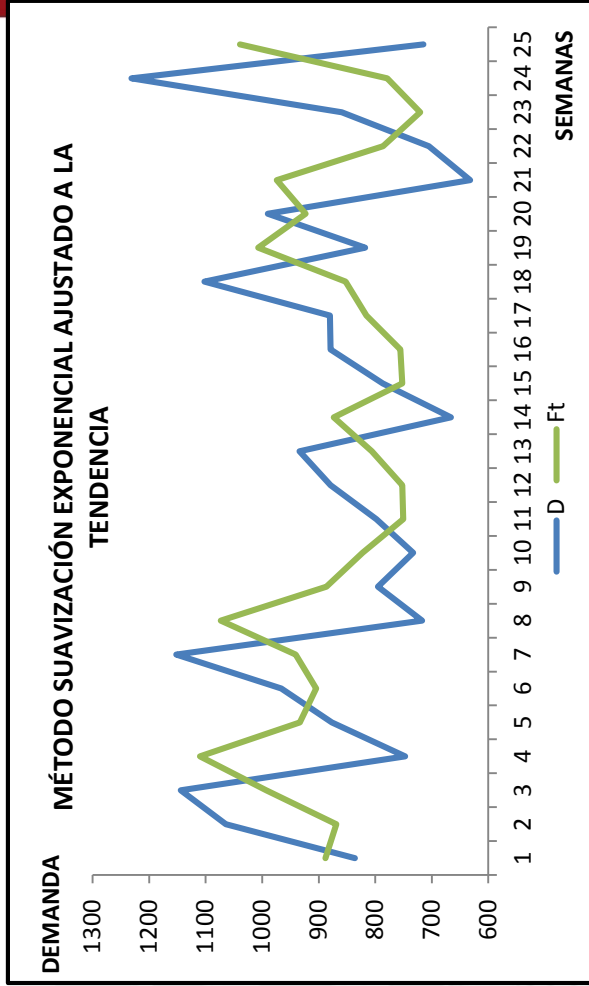
Suavización exponencial

| SEMANA | D | ALFA | | Et | Et2 | /Et/ | E% |
|-----------|------|--------|-------|------|------------|--------|------|
| | | 0.2 | 0.6 | | | | |
| 1 | 836 | 836 | 836 | - | - | - | 0% |
| 2 | 1064 | 836 | 836 | 228 | 51,984.00 | 228.00 | 21% |
| 3 | 1144 | 882 | 973 | 171 | 29,309.44 | 171.20 | 15% |
| 4 | 747 | 934.08 | 1,076 | -329 | 107,925.39 | 328.52 | 44% |
| 5 | 877 | 897 | 878 | -1 | 1.98 | 1.41 | 0% |
| 6 | 966 | 893 | 878 | 88 | 7,821.07 | 88.44 | 9% |
| 7 | 1152 | 907 | 931 | 221 | 49,006.77 | 221.37 | 19% |
| 8 | 717 | 956 | 1,063 | -346 | 120,027.68 | 346.45 | 48% |
| 9 | 795 | 908 | 856 | -61 | 3,669.94 | 60.58 | 8% |
| 10 | 733 | 886 | 819 | -86 | 7,435.96 | 86.23 | 12% |
| 11 | 798 | 855 | 767 | 31 | 930.69 | 30.51 | 4% |
| 12 | 879 | 844 | 786 | 93 | 8,686.78 | 93.20 | 11% |
| 13 | 934 | 851 | 842 | 92 | 8,515.81 | 92.28 | 10% |
| 14 | 666 | 867 | 897 | -231 | 53,401.45 | 231.09 | 35% |
| 15 | 787 | 827 | 758 | 29 | 815.96 | 28.56 | 4% |
| 16 | 879 | 819 | 776 | 103 | 10,696.94 | 103.43 | 12% |
| 17 | 880 | 831 | 838 | 42 | 1,795.25 | 42.37 | 5% |
| 18 | 1102 | 841 | 863 | 239 | 57,096.22 | 238.95 | 22% |
| 19 | 818 | 893 | 1,006 | -188 | 35,502.37 | 188.42 | 23% |
| 20 | 990 | 878 | 893 | 97 | 9,337.69 | 96.63 | 10% |
| 21 | 632 | 900 | 951 | -319 | 101,982.71 | 319.35 | 51% |
| 22 | 705 | 847 | 760 | -55 | 2,996.35 | 54.74 | 8% |
| 23 | 859 | 818 | 727 | 132 | 17,451.58 | 132.10 | 15% |
| 24 | 1231 | 827 | 806 | 425 | 180,490.53 | 424.84 | 35% |
| 25 | 715 | 907 | 1,061 | -346 | 119,759.80 | 346.06 | 48% |
| SEMANA 31 | | 869 | 853 | 29 | 986,642 | 3,955 | 467% |



SUAIVIZACIÓN EXPONENCIAL AJUSTADO A LA TENDENCIA

| SEMANA | D | Ft | A | T | Et | Et2 | /Et/ | E% |
|-----------|------|------|---------|-----|-------|-------------|-----------|------|
| 1 | 836 | 888 | 862.12 | 7 | -52 | 2729.0176 | 52.24 | 6% |
| 2 | 1064 | 869 | 966.448 | 26 | 195 | 38065.57082 | 195.104 | 18% |
| 3 | 1144 | 993 | 1068.37 | 41 | 151 | 22881.28174 | 151.2656 | 13% |
| 4 | 747 | 1110 | 928.39 | 5 | -363 | 131609.4445 | 362.78016 | 49% |
| 5 | 877 | 934 | 905.263 | -1 | -57 | 3195.078338 | 56.525024 | 6% |
| 6 | 966 | 905 | 935.372 | 6 | 61 | 3752.180709 | 61.255046 | 6% |
| 7 | 1152 | 941 | 1046.49 | 27 | 211 | 44529.26186 | 211.01958 | 18% |
| 8 | 717 | 1073 | 895.1 | -9 | -356 | 126878.5223 | 356.20012 | 50% |
| 9 | 795 | 886 | 840.595 | -18 | -91 | 8315.607003 | 91.18995 | 11% |
| 10 | 733 | 823 | 777.783 | -27 | -90 | 8022.045506 | 89.565872 | 12% |
| 11 | 798 | 751 | 774.399 | -22 | 47 | 2228.099952 | 47.202754 | 6% |
| 12 | 879 | 752 | 815.567 | -10 | 127 | 16095.18274 | 126.86679 | 14% |
| 13 | 934 | 806 | 869.994 | 3 | 128 | 16387.10569 | 128.01213 | 14% |
| 14 | 666 | 873 | 769.608 | -17 | -207 | 42938.64149 | 207.21641 | 31% |
| 15 | 787 | 752 | 769.555 | -14 | 35 | 1217.378907 | 34.890957 | 4% |
| 16 | 879 | 756 | 817.272 | -2 | 123 | 15241.27195 | 123.45555 | 14% |
| 17 | 880 | 816 | 847.804 | 5 | 64 | 4146.366538 | 64.392286 | 7% |
| 18 | 1102 | 853 | 977.289 | 30 | 249 | 62211.04856 | 249.42143 | 23% |
| 19 | 818 | 1007 | 912.503 | 11 | -189 | 35723.32265 | 189.00614 | 23% |
| 20 | 990 | 923 | 956.66 | 17 | 67 | 4446.313608 | 66.680684 | 7% |
| 21 | 632 | 974 | 803.072 | -17 | -342 | 117062.4964 | 342.14397 | 54% |
| 22 | 705 | 786 | 745.671 | -25 | -81 | 6616.504752 | 81.3419 | 12% |
| 23 | 859 | 721 | 789.903 | -11 | 138 | 19097.39498 | 138.19332 | 16% |
| 24 | 1231 | 779 | 1004.93 | 34 | 452 | 204432.0307 | 452.1416 | 37% |
| 25 | 715 | 1039 | 877.049 | 2 | -324 | 105039.7831 | 324.09842 | 45% |
| SEMANA 31 | | 879 | 439.404 | -86 | 17349 | 1042993 | 4202 | 498% |

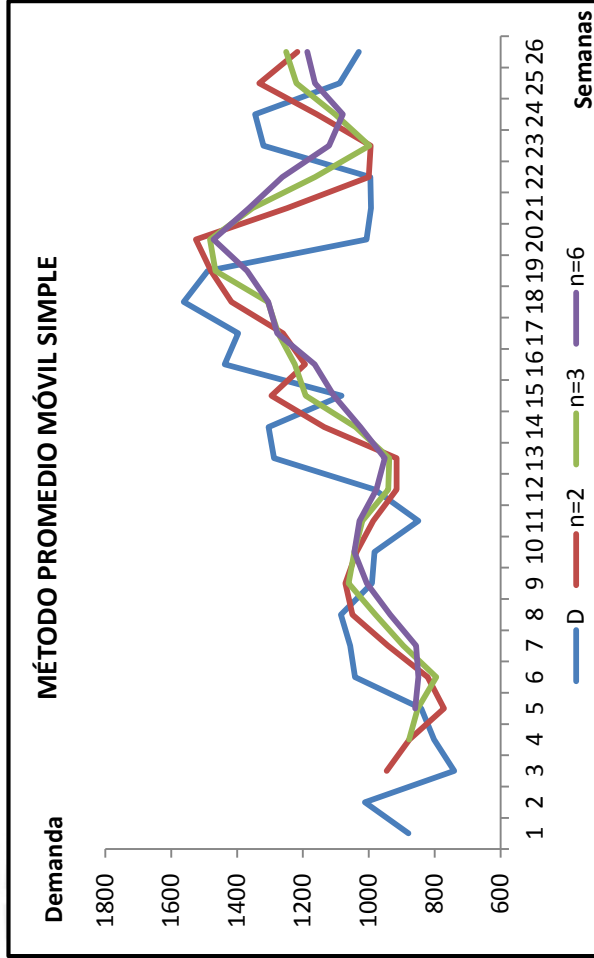


| | PM | SE $\alpha=0.6$ | SE/AT $\alpha=0.5$ |
|------|--------|--------------------|-----------------------|
| n | 23 | 24 | 25 |
| CFE | -152 | 29 | 17349 |
| MSE | 43589 | 41110 | 41720 |
| MAD | 173 | 165 | 168 |
| MAPE | 20.52% | 19.45% | 19.92% |

WCSA

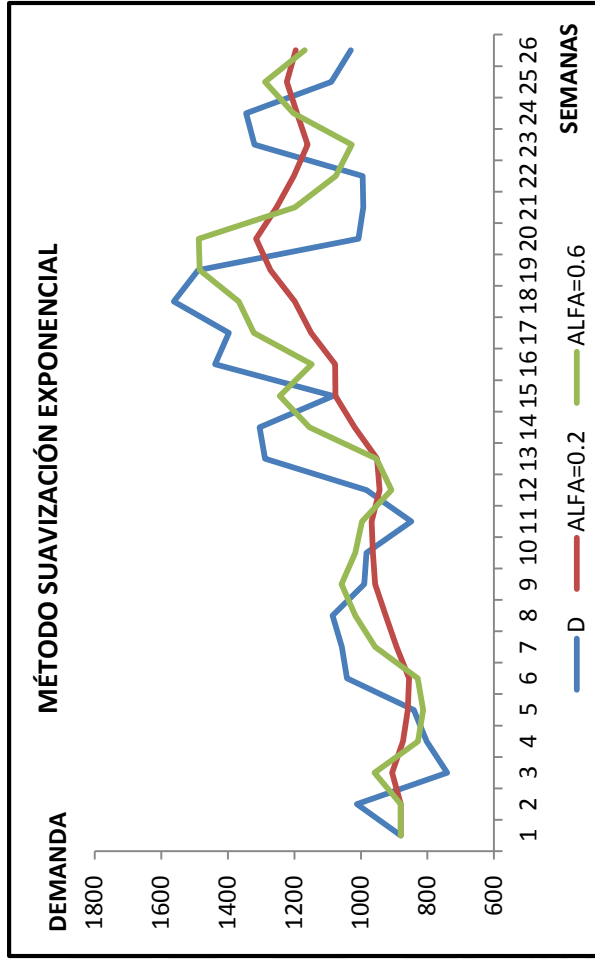
| PROMEDIO MÓVIL | | | | | | | | | |
|----------------|------|-------|-------|-------|----|------|-----------|-------|------|
| SEMANA | D | n=2 | n=3 | n=6 | EL | EI2 | /E/ | E% | |
| 1 | 880 | | | | | | | | |
| 2 | 1012 | | | | | | | | |
| 3 | 741 | 946 | | | | -205 | 42025 | 205 | 28% |
| 4 | 802 | 877 | 878 | | | -75 | 5550.25 | 75 | 9% |
| 5 | 841 | 772 | 852 | 859 | | 70 | 4830.25 | 70 | 8% |
| 6 | 1042 | 822 | 795 | 849 | | 221 | 48620.25 | 221 | 21% |
| 7 | 1057 | 942 | 895 | 857 | | 116 | 13340.25 | 116 | 11% |
| 8 | 1085 | 1,050 | 980 | 936 | | 36 | 1260.25 | 36 | 3% |
| 9 | 990 | 1,071 | 1,061 | 1,006 | | -81 | 6561 | 81 | 8% |
| 10 | 983 | 1,038 | 1,044 | 1,044 | | -55 | 2970.25 | 55 | 6% |
| 11 | 849 | 987 | 1,019 | 1,029 | | -138 | 18906.25 | 138 | 16% |
| 12 | 983 | 916 | 941 | 977 | | 67 | 4489 | 67 | 7% |
| 13 | 1288 | 916 | 938 | 951 | | 372 | 138384 | 372 | 29% |
| 14 | 1304 | 1,136 | 1,040 | 1,026 | | 169 | 28392.25 | 169 | 13% |
| 15 | 1083 | 1,296 | 1,192 | 1,106 | | -213 | 45369 | 213 | 20% |
| 16 | 1438 | 1,194 | 1,225 | 1,165 | | 245 | 59780.25 | 245 | 17% |
| 17 | 1397 | 1,261 | 1,275 | 1,278 | | 137 | 18632.25 | 137 | 10% |
| 18 | 1562 | 1,418 | 1,306 | 1,306 | | 145 | 20880.25 | 145 | 9% |
| 19 | 1489 | 1,480 | 1,466 | 1,370 | | 10 | 90.25 | 10 | 1% |
| 20 | 1007 | 1,526 | 1,483 | 1,472 | | -519 | 268842.25 | 519 | 51% |
| 21 | 993 | 1,248 | 1,353 | 1,364 | | -255 | 65025 | 255 | 26% |
| 22 | 995 | 1,000 | 1,163 | 1,263 | | -5 | 25 | 5 | 1% |
| 23 | 1320 | 994 | 998 | 1,121 | | 326 | 106276 | 326 | 25% |
| 24 | 1345 | 1,158 | 1,103 | 1,079 | | 188 | 35156.25 | 188 | 14% |
| 25 | 1089 | 1,333 | 1,220 | 1,163 | | -244 | 59292.25 | 244 | 22% |
| 26 | 1030 | 1,217 | 1,251 | 1,187 | | -187 | 34969 | 187 | 18% |
| 31 | | 1,060 | 1,155 | 1,196 | | 123 | 1,029,667 | 4,072 | 372% |

CV 0.20



Suavización exponencial

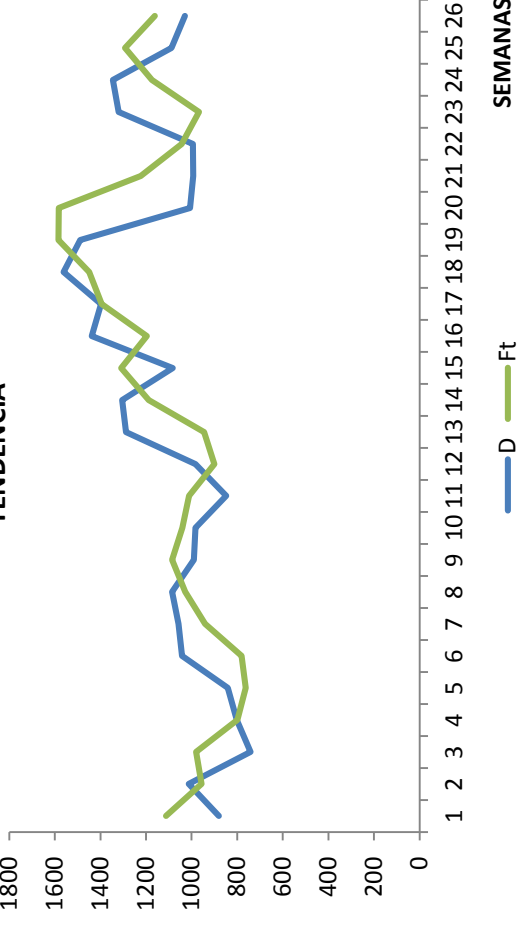
| SEMANA | D | ALFA | | Et | Et2 | /Et/ | E% |
|-----------|------|----------|----------|------|------------|--------|------|
| | | 0.2 | 0.6 | | | | |
| 1 | 880 | 880 | 880 | - | - | - | 0% |
| 2 | 1012 | 880 | 880 | 132 | 17,424.00 | 132.00 | 13% |
| 3 | 741 | 906 | 959 | -218 | 47,611.24 | 218.20 | 29% |
| 4 | 802 | 873 | 828 | -26 | 690.64 | 26.28 | 3% |
| 5 | 841 | 859 | 813 | 28 | 811.57 | 28.49 | 3% |
| 6 | 1042 | 855 | 830 | 212 | 45,111.72 | 212.40 | 20% |
| 7 | 1057 | 893 | 957 | 100 | 9,991.62 | 99.96 | 9% |
| 8 | 1085 | 926 | 1,017 | 68 | 4,621.72 | 67.98 | 6% |
| 9 | 990 | 957 | 1,058 | -68 | 4,597.75 | 67.81 | 7% |
| 10 | 983 | 964 | 1,017 | -34 | 1,164.36 | 34.12 | 3% |
| 11 | 849 | 968 | 997 | -148 | 21,800.25 | 147.65 | 17% |
| 12 | 983 | 944 | 908 | 75 | 5,616.06 | 74.94 | 8% |
| 13 | 1288 | 952 | 953 | 335 | 112,209.02 | 334.98 | 26% |
| 14 | 1304 | 1,019 | 1,154 | 150 | 22,497.14 | 149.99 | 12% |
| 15 | 1083 | 1,076 | 1,244 | -161 | 25,922.23 | 161.00 | 15% |
| 16 | 1438 | 1,077 | 1,147 | 291 | 84,447.47 | 290.60 | 20% |
| 17 | 1397 | 1,150 | 1,322 | 75 | 5,660.97 | 75.24 | 5% |
| 18 | 1562 | 1,199 | 1,367 | 195 | 38,062.35 | 195.10 | 12% |
| 19 | 1489 | 1,272 | 1,484 | 5 | 25.38 | 5.04 | 0% |
| 20 | 1007 | 1,315 | 1,487 | -480 | 230,385.29 | 479.98 | 48% |
| 21 | 993 | 1,253 | 1,199 | -206 | 42,433.48 | 205.99 | 21% |
| 22 | 995 | 1,201 | 1,075 | -80 | 6,463.77 | 80.40 | 8% |
| 23 | 1320 | 1,160 | 1,027 | 293 | 85,755.84 | 292.84 | 22% |
| 24 | 1345 | 1,192 | 1,203 | 142 | 20,202.75 | 142.14 | 11% |
| 25 | 1089 | 1,222.67 | 1,288 | -199 | 39,658.91 | 199.15 | 18% |
| 26 | 1030 | 1,196 | 1,168.66 | -139 | 19,226.09 | 138.66 | 13% |
| SEMANA 31 | | 1,162.75 | 1,085.46 | 342 | 892,392 | 3,861 | 352% |



SUAVIZACIÓN EXPONENCIAL AJUSTADO A LA TENDENCIA

| SEMANA | D | Ft | A | T | Et | Et2 | FEV | EV | EV² |
|-----------|------|------|-------------|-----|------|--------------|-----------|------|-----|
| 1 | 880 | 1112 | 972.8769231 | -16 | -232 | 53913.26775 | 232.19231 | 26% | |
| 2 | 1012 | 957 | 990.0055385 | -9 | 55 | 3023.477115 | 54.986154 | 5% | |
| 3 | 741 | 981 | 836.89632 | -38 | -240 | 57475.65118 | 239.7408 | 32% | |
| 4 | 802 | 799 | 800.7450742 | -38 | 3 | 9.842742031 | 3.1373145 | 0% | |
| 5 | 841 | 763 | 809.835167 | -28 | 78 | 6070.292601 | 77.912083 | 9% | |
| 6 | 1042 | 782 | 937.8109841 | 3 | 260 | 67845.94401 | 260.47254 | 25% | |
| 7 | 1057 | 941 | 1010.503993 | 17 | 116 | 13511.74178 | 116.24002 | 11% | |
| 8 | 1085 | 1027 | 1061.960717 | 24 | 58 | 3317.553459 | 57.598207 | 5% | |
| 9 | 990 | 1086 | 1028.308121 | 12 | -96 | 9171.95077 | 95.770302 | 10% | |
| 10 | 983 | 1041 | 1006.050108 | 5 | -58 | 3320.671692 | 57.62527 | 6% | |
| 11 | 849 | 1011 | 913.9808897 | -14 | -162 | 26390.72514 | 162.45222 | 19% | |
| 12 | 983 | 900 | 949.7554957 | -4 | 83 | 6907.481683 | 83.111261 | 8% | |
| 13 | 1288 | 946 | 1151.054679 | 37 | 342 | 117212.6316 | 342.3633 | 27% | |
| 14 | 1304 | 1188 | 1257.60779 | 51 | 116 | 13451.482 | 115.98052 | 9% | |
| 15 | 1083 | 1308 | 1173.1961 | 24 | -225 | 50845.85303 | 225.49025 | 21% | |
| 16 | 1438 | 1197 | 1341.607892 | 53 | 241 | 58071.49043 | 240.98027 | 17% | |
| 17 | 1397 | 1394 | 1395.939662 | 53 | 3 | 7.026981799 | 2.6508455 | 0% | |
| 18 | 1562 | 1449 | 1516.79961 | 67 | 113 | 12769.22019 | 113.00097 | 7% | |
| 19 | 1489 | 1583 | 1526.767636 | 55 | -94 | 8914.96476 | 94.419091 | 6% | |
| 20 | 1007 | 1582 | 1237.022731 | -14 | -575 | 330690.35335 | 575.05683 | 57% | |
| 21 | 993 | 1223 | 1085.12204 | -41 | -230 | 53040.43966 | 230.3051 | 23% | |
| 22 | 995 | 1044 | 1014.50712 | -47 | -49 | 2378.298225 | 48.767799 | 5% | |
| 23 | 1320 | 967 | 1178.920297 | -5 | 353 | 124396.7664 | 352.69926 | 27% | |
| 24 | 1345 | 1174 | 1276.615132 | 16 | 171 | 29228.06339 | 170.96217 | 13% | |
| 25 | 1089 | 1292 | 1170.29925 | -9 | -203 | 41309.80078 | 203.24813 | 19% | |
| 26 | 1030 | 1162 | 1082.616988 | -25 | -132 | 17303.42122 | 131.54247 | 13% | |
| SEMANA 31 | | 1058 | - | - | -305 | 1110578 | 4289 | 401% | |

MÉTODO SUAVIZACIÓN EXPONENCIAL AJUSTADO A LA TENDENCIA



| | PM | SE | SE/AT |
|------|--------|--------|--------------|
| n | 24 | 25 | $\alpha=0.6$ |
| CFE | 123 | 342 | 26 |
| MSE | 42903 | 35696 | -305 |
| MAD | 170 | 154 | 42715 |
| MAPE | 15.51% | 14.10% | 165 |
| | | | 15.43% |

ANEXO 10. Base de datos de removidos

PILOTO REMOVIDO

| Mes | Manifiesto | Nave | Condición | Tamaño | Categoría | Operación | Deposito | Línea | Servicio | Nombre de Servicio | Tipo de Movimiento | Is Reefer | Num de Mov. |
|-----|------------|-----------|-----------|--------|-----------|-----------|----------|-------|----------|--------------------|--------------------|-----------|-------------|
| 9 | 2015-01234 | MSC PILAR | FCL | 20 | IMPRT | Directo | 3550 | MSC | USEC N | USEC N | DLVR | FALSO | 40 |
| 9 | 2015-01234 | MSC PILAR | FCL | 20 | IMPRT | Directo | 3550 | MSC | USEC N | USEC N | DSCH | FALSO | 2 |
| 9 | 2015-01234 | MSC PILAR | FCL | 20 | IMPRT | Directo | 3550 | MSC | USEC N | USEC N | YARD | FALSO | 6 |
| 9 | 2015-01234 | MSC PILAR | FCL | 20 | IMPRT | Directo | 3727 | MSC | USEC N | USEC N | DLVR | FALSO | 28 |
| 9 | 2015-01234 | MSC PILAR | FCL | 20 | IMPRT | Directo | 3727 | MSC | USEC N | USEC N | DSCH | FALSO | 7 |
| 9 | 2015-01234 | MSC PILAR | FCL | 20 | IMPRT | Directo | 3727 | MSC | USEC N | USEC N | SHFT | FALSO | 2 |
| 9 | 2015-01234 | MSC PILAR | FCL | 20 | IMPRT | Directo | 9998 | MSC | USEC N | USEC N | DLVR | FALSO | 40 |
| 9 | 2015-01234 | MSC PILAR | FCL | 20 | IMPRT | Directo | 9998 | MSC | USEC N | USEC N | DSCH | FALSO | 10 |
| 9 | 2015-01234 | MSC PILAR | FCL | 20 | IMPRT | Directo | 9998 | MSC | USEC N | USEC N | SHFT | FALSO | 4 |
| 9 | 2015-01234 | MSC PILAR | FCL | 20 | IMPRT | Directo | 9998 | MSC | USEC N | USEC N | YARD | FALSO | 5 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | EXPRT | Directo | 3727 | MSC | USEC N | USEC N | LOAD | VERDADERO | 2 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | EXPRT | Directo | 3727 | MSC | USEC N | USEC N | RECV | VERDADERO | 2 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3033 | MSC | USEC N | USEC N | DLVR | FALSO | 110 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3033 | MSC | USEC N | USEC N | DSCH | FALSO | 55 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3033 | MSC | USEC N | USEC N | SHFT | FALSO | 47 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3033 | MSC | USEC N | USEC N | YARD | FALSO | 39 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3181 | MSC | USEC N | USEC N | DLVR | FALSO | 2 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3181 | MSC | USEC N | USEC N | DSCH | FALSO | 1 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3636 | MSC | USEC N | USEC N | DLVR | FALSO | 6 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3636 | MSC | USEC N | USEC N | DSCH | FALSO | 3 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3636 | MSC | USEC N | USEC N | SHFT | FALSO | 2 |

| | | | | | | | | | | | | | |
|---|------------|-------------|-----|----|--------|-----------|------|-----|--------|--------|------|-------|-----|
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3636 | MSC | USEC N | USEC N | YARD | FALSO | 1 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3727 | MSC | USEC N | USEC N | DLVR | FALSO | 36 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3727 | MSC | USEC N | USEC N | DSCH | FALSO | 18 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3727 | MSC | USEC N | USEC N | SHFT | FALSO | 7 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3727 | MSC | USEC N | USEC N | YARD | FALSO | 4 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3803 | MSC | USEC N | USEC N | DLVR | FALSO | 24 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3803 | MSC | USEC N | USEC N | DSCH | FALSO | 6 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3803 | MSC | USEC N | USEC N | YARD | FALSO | 1 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3951 | MSC | USEC N | USEC N | DLVR | FALSO | 2 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 3951 | MSC | USEC N | USEC N | DSCH | FALSO | 1 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 9998 | MSC | USEC N | USEC N | DLVR | FALSO | 254 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 9998 | MSC | USEC N | USEC N | DSCH | FALSO | 127 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 9998 | MSC | USEC N | USEC N | SHFT | FALSO | 33 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | IMPRT | Directo | 9998 | MSC | USEC N | USEC N | YARD | FALSO | 41 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | TRSHIP | Indirecto | 3014 | MSC | USEC N | USEC N | DSCH | FALSO | 1 |
| 9 | 2015-01234 | MSC PILAR | FCL | 40 | TRSHIP | Indirecto | 3014 | MSC | USEC N | USEC N | LOAD | FALSO | 1 |
| 9 | 2015-01273 | PINE 6 | FCL | 20 | IMPRT | Indirecto | 3014 | TBS | AMERIC | AMERIC | DLVR | FALSO | 10 |
| 9 | 2015-01273 | PINE 6 | FCL | 20 | IMPRT | Indirecto | 3014 | TBS | AMERIC | AMERIC | DSCH | FALSO | 5 |
| 9 | 2015-01273 | PINE 6 | FCL | 20 | IMPRT | Indirecto | 3014 | TBS | AMERIC | AMERIC | SHFT | FALSO | 6 |
| 9 | 2015-01273 | PINE 6 | FCL | 20 | IMPRT | Indirecto | 3014 | TBS | AMERIC | AMERIC | YARD | FALSO | 31 |
| 9 | 2015-01278 | MSC ORNELLA | FCL | 20 | IMPRT | Indirecto | 3014 | MSC | WCSA | WCSA | DLVR | FALSO | 18 |
| 9 | 2015-01278 | MSC ORNELLA | FCL | 20 | IMPRT | Indirecto | 3014 | MSC | WCSA | WCSA | DSCH | FALSO | 9 |
| 9 | 2015-01278 | MSC ORNELLA | FCL | 20 | IMPRT | Indirecto | 3014 | MSC | WCSA | WCSA | SHFT | FALSO | 20 |
| 9 | 2015-01278 | MSC ORNELLA | FCL | 20 | IMPRT | Indirecto | 3014 | MSC | WCSA | WCSA | YARD | FALSO | 19 |

Los anexos sólo contienen un extracto de la información completa, pues es de carácter confidencial

ANEXO 11 Cálculo de COK

| Fecha | Stripped Spread EMBIG Perú (pbs) | Tasa de Interés (%) | |
|---------------------------|--|--------------------------|--|
| | | Tesoro de EUA 10 años | |
| 2014 | 162 | 2.34 | |
| Ene. | 177 | 1.64 | |
| Feb. | 183 | 1.50 | |
| Mar. | 167 | 1.63 | |
| Abr. | 154 | 1.70 | |
| May. | 149 | 1.58 | |
| Jun. | 145 | 1.67 | |
| Jul. | 147 | 1.69 | |
| Aug. | 157 | 1.62 | |
| Set. | 150 | 1.77 | |
| Oct. | 170 | 1.52 | |
| Nov. | 165 | 1.61 | |
| Dic. | 182 | 1.64 | |
| 2015 | | | |
| Ene. | 202 | 1.37 | |
| Feb. | 183 | 1.47 | |
| Mar. | 184 | 1.51 | |
| Abr. | 177 | 1.35 | |
| May. | 166 | 1.54 | |
| Jun. | 177 | 1.68 | |
| Jul. | 187 | 1.62 | |
| Ago. | 217 | 1.53 | |
| Set. | 234 | 1.48 | |
| Oct. | 226 | 1.43 | |
| Nov 1-11 | 167 | 2.47 | |
| PROMEDIO ANUAL | 192 | 1.52 | |
| PROMEDIO ANUAL (%) | 1.92 | 1.52 | |

| Industry Name | Number of firms | Beta | D/E Ratio | Tax rate | Unlevered beta | Cash/Firm value | Unlevered beta corrected for cash |
|--------------------|-----------------|------|-----------|----------|----------------|-----------------|-----------------------------------|
| Advertising | 65 | 1.03 | 52.57% | 6.04% | 0.69 | 5.91% | 0.73 |
| Aerospace/Defe | 95 | 1.01 | 18.99% | 15.03% | 0.87 | 6.24% | 0.92 |
| Air Transport | 25 | 0.94 | 109.48% | 13.79% | 0.48 | 6.92% | 0.52 |
| Apparel | 70 | 1.15 | 21.33% | 10.29% | 0.96 | 2.99% | 0.99 |
| Auto & Truck | 26 | 1.28 | 97.56% | 4.71% | 0.66 | 8.48% | 0.72 |
| Auto Parts | 75 | 1.46 | 32.00% | 9.43% | 1.13 | 8.04% | 1.23 |
| Bank | 7 | 0.72 | 84.19% | 22.17% | 0.43 | 10.94% | 0.49 |
| Banks (Regional) | 721 | 0.58 | 72.00% | 18.00% | 0.37 | 13.80% | 0.43 |
| Beverage | 47 | 1.42 | 22.16% | 3.95% | 1.17 | 5.06% | 1.24 |
| Beverage (Alcoh | 19 | 1.14 | 27.56% | 10.72% | 0.91 | 1.38% | 0.93 |
| Biotechnology | 349 | 1.12 | 9.15% | 1.13% | 1.02 | 4.39% | 1.07 |
| Broadcasting | 30 | 1.53 | 48.49% | 13.21% | 1.08 | 2.31% | 1.1 |
| Brokerage & Inve | 49 | 1.11 | 400.56% | 13.44% | 0.25 | 24.39% | 0.33 |
| Building Materials | 37 | 1.27 | 30.05% | 16.33% | 1.02 | 5.04% | 1.07 |
| Business & Cons | 179 | 0.9 | 29.23% | 13.41% | 0.62 | 4.33% | 0.65 |
| Cable TV | 16 | 0.97 | 49.23% | 15.00% | 0.69 | 2.58% | 0.71 |
| Chemical (Basic) | 47 | 1.01 | 29.67% | 6.27% | 0.79 | 7.19% | 0.85 |
| Chemical (Divers | 10 | 1.42 | 33.39% | 25.03% | 1.13 | 6.82% | 1.22 |
| Chemical (Specia | 100 | 1.01 | 16.30% | 12.74% | 0.89 | 6.25% | 0.95 |
| Coal & Related E | 45 | 1.28 | 86.63% | 2.44% | 0.69 | 5.86% | 0.73 |
| Computer Servic | 129 | 0.92 | 20.48% | 9.94% | 0.78 | 5.48% | 0.82 |
| Computer Softw | 273 | 1.07 | 8.68% | 6.16% | 0.99 | 5.50% | 1.04 |



Costo de oportunidad (Re)
 $Re = Rf + \beta(Rm - Rf) + RP$

| | |
|------|--------|
| Rf | 1.52% |
| Beta | 0.65 |
| Rm | 13.69% |
| RP | 1.92% |

Re = 11%