Video-Effects.R

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rm(list=ls(all=TRUE))  
library(plm)  
  
fp\_sales <- read.csv('D:/Study material/Sem 3/Causal Analytics and AB testing/Datasets/FP Analysis Data.csv')  
cp\_sales <- read.csv('D:/Study material/Sem 3/Causal Analytics and AB testing/Datasets/CP Analysis Data.csv')  
  
### Randomization test for Product Prices ###  
treat\_mean = mean(subset(fp\_sales, Vid == 1)$ProdPrice)  
cont\_mean = mean(subset(fp\_sales, Vid == 0)$ProdPrice)  
treat\_sd = sd(subset(fp\_sales, Vid == 1)$ProdPrice)  
cont\_sd = sd(subset(fp\_sales, Vid == 0)$ProdPrice)  
  
# There is no substantial difference between the mean  
# and SD of price between the treatment and control groups  
  
### T-stat for difference of means ###  
t = (20.71 - 20.41)/sqrt((5.48^2/58)+(4.79^2/239))  
t

## [1] 0.3829304

# Testing the difference in mean sales  
# between the treatment and control group  
diff\_in\_means = mean(subset(fp\_sales, VidWk == 1)$Sales) - mean(subset(fp\_sales, VidWk == 0)$Sales)  
diff\_in\_means

## [1] 28.40869

# A diff in mean of 28.41 could imply that   
  
model1 <- plm(Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk + HomePgWk + CatPgWk + factor(ProdID) + factor(Wk),  
 data = fp\_sales, model = 'pooling', index = c('ProdID', "Wk"))  
summary(model1)

## Pooling Model  
##   
## Call:  
## plm(formula = Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk +   
## HomePgWk + CatPgWk + factor(ProdID) + factor(Wk), data = fp\_sales,   
## model = "pooling", index = c("ProdID", "Wk"))  
##   
## Unbalanced Panel: n = 297, T = 2-28, N = 6828  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -649.5517 -38.1418 -4.2166 28.2288 1890.3086   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 23.21490 17.53921 1.3236 0.1856823   
## VidWk 16.70583 5.08573 3.2848 0.0010258 \*\*   
## PriceDiscWk 76.62329 5.82463 13.1550 < 2.2e-16 \*\*\*  
## EmailWk 68.91290 22.04821 3.1256 0.0017825 \*\*   
## CatalogWk 103.80028 17.01345 6.1011 1.114e-09 \*\*\*  
## HomePgWk 61.08341 9.41841 6.4855 9.492e-11 \*\*\*  
## CatPgWk 29.43734 10.15093 2.9000 0.0037446 \*\*   
## factor(ProdID)2143 167.60250 22.85124 7.3345 2.496e-13 \*\*\*  
## factor(ProdID)2413 43.81678 22.85124 1.9175 0.0552208 .   
## factor(ProdID)2461 17.86378 22.84660 0.7819 0.4343010   
## factor(ProdID)2532 53.62909 25.83704 2.0757 0.0379640 \*   
## factor(ProdID)2637 22.63821 22.85124 0.9907 0.3218799   
## factor(ProdID)2663 62.35250 22.85124 2.7286 0.0063770 \*\*   
## factor(ProdID)2700 29.45964 22.85124 1.2892 0.1973771   
## factor(ProdID)2716 73.63821 22.85124 3.2225 0.0012770 \*\*   
## factor(ProdID)2800 112.63821 22.85124 4.9292 8.462e-07 \*\*\*  
## factor(ProdID)3133 18.12860 25.41856 0.7132 0.4757456   
## factor(ProdID)3164 94.85250 22.85124 4.1509 3.354e-05 \*\*\*  
## factor(ProdID)3251 52.43663 24.06011 2.1794 0.0293377 \*   
## factor(ProdID)3253 93.27226 22.84366 4.0831 4.498e-05 \*\*\*  
## factor(ProdID)3261 272.68656 25.03987 10.8901 < 2.2e-16 \*\*\*  
## factor(ProdID)3269 91.45306 25.04629 3.6514 0.0002629 \*\*\*  
## factor(ProdID)3292 3.06678 22.85124 0.1342 0.8932435   
## factor(ProdID)3311 96.78107 22.85124 4.2353 2.314e-05 \*\*\*  
## factor(ProdID)3329 43.45964 22.85124 1.9019 0.0572349 .   
## factor(ProdID)3339 95.31678 22.85124 4.1712 3.070e-05 \*\*\*  
## factor(ProdID)3364 62.17392 22.85124 2.7208 0.0065295 \*\*   
## factor(ProdID)3381 55.16556 23.23396 2.3743 0.0176088 \*   
## factor(ProdID)3383 74.41055 23.06343 3.2263 0.0012600 \*\*   
## factor(ProdID)3408 38.70368 22.86206 1.6929 0.0905182 .   
## factor(ProdID)3409 60.36663 22.86403 2.6402 0.0083044 \*\*   
## factor(ProdID)3413 -9.78131 62.73534 -0.1559 0.8761058   
## factor(ProdID)3416 190.60250 22.85124 8.3410 < 2.2e-16 \*\*\*  
## factor(ProdID)3418 166.92392 22.85124 7.3048 3.109e-13 \*\*\*  
## factor(ProdID)3435 32.99535 22.85124 1.4439 0.1488097   
## factor(ProdID)3479 36.53424 24.41886 1.4961 0.1346635   
## factor(ProdID)3511 52.85416 22.84519 2.3136 0.0207218 \*   
## factor(ProdID)3561 29.50000 22.84271 1.2914 0.1965970   
## factor(ProdID)3618 4.13821 22.85124 0.1811 0.8562998   
## factor(ProdID)3619 -3.92623 26.80494 -0.1465 0.8835515   
## factor(ProdID)3642 37.29575 25.83704 1.4435 0.1489280   
## factor(ProdID)3643 105.13821 22.85124 4.6010 4.285e-06 \*\*\*  
## factor(ProdID)3659 -5.50465 22.85124 -0.2409 0.8096475   
## factor(ProdID)3671 190.24535 22.85124 8.3254 < 2.2e-16 \*\*\*  
## factor(ProdID)3677 69.22536 23.06343 3.0015 0.0026966 \*\*   
## factor(ProdID)3678 -16.32608 22.85124 -0.7145 0.4749743   
## factor(ProdID)3680 67.86652 24.78787 2.7379 0.0062003 \*\*   
## factor(ProdID)3696 -11.24620 23.41517 -0.4803 0.6310336   
## factor(ProdID)3701 123.99535 22.85124 5.4262 5.965e-08 \*\*\*  
## factor(ProdID)3723 -28.43224 23.00223 -1.2361 0.2164793   
## factor(ProdID)3727 -8.10051 28.00075 -0.2893 0.7723640   
## factor(ProdID)3728 -6.42623 26.80494 -0.2397 0.8105389   
## factor(ProdID)3729 32.95964 22.85124 1.4424 0.1492499   
## factor(ProdID)3730 -6.98202 25.83704 -0.2702 0.7869895   
## factor(ProdID)3741 46.42392 22.85124 2.0316 0.0422376 \*   
## factor(ProdID)3743 22.63821 22.85124 0.9907 0.3218799   
## factor(ProdID)3745 116.24535 22.85124 5.0870 3.739e-07 \*\*\*  
## factor(ProdID)3746 42.42392 22.85124 1.8565 0.0634238 .   
## factor(ProdID)3747 75.78107 22.85124 3.3163 0.0009173 \*\*\*  
## factor(ProdID)3749 -4.08193 25.41856 -0.1606 0.8724225   
## factor(ProdID)3751 32.92392 22.85124 1.4408 0.1496911   
## factor(ProdID)3753 20.03107 22.85124 0.8766 0.3807441   
## factor(ProdID)3757 -29.38192 24.71157 -1.1890 0.2344852   
## factor(ProdID)3759 -16.23906 24.71157 -0.6571 0.5111115   
## factor(ProdID)3765 -2.89750 22.85124 -0.1268 0.8991037   
## factor(ProdID)3770 -4.60714 22.84271 -0.2017 0.8401655   
## factor(ProdID)3771 7.85465 28.71208 0.2736 0.7844269   
## factor(ProdID)3778 11.92392 22.85124 0.5218 0.6018228   
## factor(ProdID)3785 19.47003 28.71208 0.6781 0.4977243   
## factor(ProdID)3788 -8.45304 28.71208 -0.2944 0.7684562   
## factor(ProdID)3808 -13.86063 27.36940 -0.5064 0.6125734   
## factor(ProdID)3809 4.28107 22.85124 0.1873 0.8513959   
## factor(ProdID)3810 16.53107 22.85124 0.7234 0.4694472   
## factor(ProdID)3811 51.89286 22.84271 2.2717 0.0231344 \*   
## factor(ProdID)3864 84.53107 22.85124 3.6992 0.0002181 \*\*\*  
## factor(ProdID)3880 126.99535 22.85124 5.5575 2.846e-08 \*\*\*  
## factor(ProdID)3887 406.72689 22.87256 17.7823 < 2.2e-16 \*\*\*  
## factor(ProdID)3888 135.07377 26.80494 5.0391 4.803e-07 \*\*\*  
## factor(ProdID)3889 -1.68226 24.76998 -0.0679 0.9458551   
## factor(ProdID)3890 -8.65563 30.45532 -0.2842 0.7762605   
## factor(ProdID)3891 65.53107 22.85124 2.8677 0.0041477 \*\*   
## factor(ProdID)3893 82.03949 22.94035 3.5762 0.0003511 \*\*\*  
## factor(ProdID)3894 16.13460 26.34942 0.6123 0.5403393   
## factor(ProdID)3895 24.64286 22.84271 1.0788 0.2807142   
## factor(ProdID)3897 17.93389 23.05464 0.7779 0.4366644   
## factor(ProdID)3898 117.63821 22.85124 5.1480 2.710e-07 \*\*\*  
## factor(ProdID)3902 26.50000 22.84271 1.1601 0.2460477   
## factor(ProdID)3904 84.57807 22.84660 3.7020 0.0002157 \*\*\*  
## factor(ProdID)3905 201.81678 22.85124 8.8318 < 2.2e-16 \*\*\*  
## factor(ProdID)3906 222.13821 22.85124 9.7211 < 2.2e-16 \*\*\*  
## factor(ProdID)3907 136.10343 24.69911 5.5105 3.716e-08 \*\*\*  
## factor(ProdID)3908 33.37859 25.46215 1.3109 0.1899346   
## factor(ProdID)3909 9.82143 22.84271 0.4300 0.6672398   
## factor(ProdID)3911 32.91524 23.52616 1.3991 0.1618335   
## factor(ProdID)3912 89.35714 22.84271 3.9118 9.253e-05 \*\*\*  
## factor(ProdID)3913 -1.96893 22.85124 -0.0862 0.9313394   
## factor(ProdID)3914 54.70822 24.06960 2.2729 0.0230636 \*   
## factor(ProdID)3915 70.92392 22.85124 3.1037 0.0019192 \*\*   
## factor(ProdID)3917 -26.88990 26.80574 -1.0031 0.3158309   
## factor(ProdID)3918 -8.05847 26.29756 -0.3064 0.7592838   
## factor(ProdID)3924 80.28949 22.94035 3.4999 0.0004685 \*\*\*  
## factor(ProdID)3925 69.78274 22.84519 3.0546 0.0022628 \*\*   
## factor(ProdID)3926 83.74702 22.84519 3.6658 0.0002485 \*\*\*  
## factor(ProdID)3927 36.03274 22.84519 1.5773 0.1147851   
## factor(ProdID)3928 23.05083 24.09095 0.9568 0.3386911   
## factor(ProdID)3929 13.13821 22.85124 0.5749 0.5653482   
## factor(ProdID)3930 -24.76737 25.22136 -0.9820 0.3261364   
## factor(ProdID)3931 3.24185 29.70555 0.1091 0.9131005   
## factor(ProdID)3932 65.95964 22.85124 2.8865 0.0039086 \*\*   
## factor(ProdID)3933 2.14809 24.76691 0.0867 0.9308871   
## factor(ProdID)3935 9.58194 25.16107 0.3808 0.7033462   
## factor(ProdID)3936 62.38821 22.85124 2.7302 0.0063468 \*\*   
## factor(ProdID)3937 11.64286 22.84271 0.5097 0.6102812   
## factor(ProdID)3938 243.80931 22.98799 10.6059 < 2.2e-16 \*\*\*  
## factor(ProdID)3939 90.01092 23.22807 3.8751 0.0001076 \*\*\*  
## factor(ProdID)3940 36.15235 22.86403 1.5812 0.1138836   
## factor(ProdID)3942 72.53107 22.85124 3.1741 0.0015103 \*\*   
## factor(ProdID)3943 258.53107 22.85124 11.3137 < 2.2e-16 \*\*\*  
## factor(ProdID)3945 95.14663 22.94035 4.1476 3.403e-05 \*\*\*  
## factor(ProdID)3946 72.43699 22.92992 3.1591 0.0015900 \*\*   
## factor(ProdID)3948 217.90317 22.96740 9.4875 < 2.2e-16 \*\*\*  
## factor(ProdID)3950 -10.81765 22.94035 -0.4716 0.6372598   
## factor(ProdID)3951 8.76713 24.76691 0.3540 0.7233610   
## factor(ProdID)3952 -6.28194 22.94035 -0.2738 0.7842179   
## factor(ProdID)3953 167.45964 22.85124 7.3283 2.614e-13 \*\*\*  
## factor(ProdID)3954 36.59654 22.86206 1.6008 0.1094799   
## factor(ProdID)3955 32.87259 22.85429 1.4384 0.1503814   
## factor(ProdID)3956 67.70912 22.96629 2.9482 0.0032077 \*\*   
## factor(ProdID)3959 53.86779 23.28069 2.3138 0.0207075 \*   
## factor(ProdID)3960 57.45964 22.85124 2.5145 0.0119438 \*   
## factor(ProdID)3962 103.37259 22.85429 4.5231 6.202e-06 \*\*\*  
## factor(ProdID)3964 160.63821 22.85124 7.0297 2.281e-12 \*\*\*  
## factor(ProdID)3965 53.40546 22.87256 2.3349 0.0195782 \*   
## factor(ProdID)3966 33.99535 22.85124 1.4877 0.1368835   
## factor(ProdID)3967 133.84369 22.84366 5.8591 4.881e-09 \*\*\*  
## factor(ProdID)3984 100.35250 22.85124 4.3916 1.143e-05 \*\*\*  
## factor(ProdID)3987 163.07702 25.05700 6.5082 8.171e-11 \*\*\*  
## factor(ProdID)3988 110.80306 25.04629 4.4239 9.850e-06 \*\*\*  
## factor(ProdID)3990 66.92765 24.06293 2.7814 0.0054288 \*\*   
## factor(ProdID)3992 75.21806 22.94035 3.2789 0.0010478 \*\*   
## factor(ProdID)3993 207.83275 23.09779 8.9979 < 2.2e-16 \*\*\*  
## factor(ProdID)3995 -16.22854 25.84228 -0.6280 0.5300363   
## factor(ProdID)3997 41.88101 22.94324 1.8254 0.0679838 .   
## factor(ProdID)3998 1.10250 22.85124 0.0482 0.9615211   
## factor(ProdID)4002 338.17883 25.59079 13.2149 < 2.2e-16 \*\*\*  
## factor(ProdID)4004 80.82988 23.40201 3.4540 0.0005559 \*\*\*  
## factor(ProdID)4005 96.53107 22.85124 4.2243 2.429e-05 \*\*\*  
## factor(ProdID)4006 111.74535 22.85124 4.8901 1.032e-06 \*\*\*  
## factor(ProdID)4007 89.06678 22.85124 3.8977 9.810e-05 \*\*\*  
## factor(ProdID)4008 21.71429 22.84271 0.9506 0.3418427   
## factor(ProdID)4010 689.58816 22.97595 30.0135 < 2.2e-16 \*\*\*  
## factor(ProdID)4011 22.04414 22.92992 0.9614 0.3364020   
## factor(ProdID)4018 11.72162 23.01705 0.5093 0.6105886   
## factor(ProdID)4020 0.25842 22.92992 0.0113 0.9910083   
## factor(ProdID)4021 40.29116 22.93319 1.7569 0.0789831 .   
## factor(ProdID)4022 47.81678 22.85124 2.0925 0.0364303 \*   
## factor(ProdID)4023 124.49535 22.85124 5.4481 5.279e-08 \*\*\*  
## factor(ProdID)4025 11.00378 22.94035 0.4797 0.6314790   
## factor(ProdID)4026 53.38821 22.85124 2.3363 0.0195039 \*   
## factor(ProdID)4027 41.32143 22.84271 1.8090 0.0705043 .   
## factor(ProdID)4030 89.74535 22.85124 3.9274 8.677e-05 \*\*\*  
## factor(ProdID)4031 116.42392 22.85124 5.0949 3.588e-07 \*\*\*  
## factor(ProdID)4033 -15.79291 22.93264 -0.6887 0.4910585   
## factor(ProdID)4034 -7.09313 25.83704 -0.2745 0.7836833   
## factor(ProdID)4035 -18.09313 25.83704 -0.7003 0.4837782   
## factor(ProdID)4036 110.67857 22.84271 4.8452 1.294e-06 \*\*\*  
## factor(ProdID)4041 -15.42006 24.90996 -0.6190 0.5359171   
## factor(ProdID)4046 30.04206 25.06499 1.1986 0.2307403   
## factor(ProdID)4047 148.19205 24.76962 5.9828 2.310e-09 \*\*\*  
## factor(ProdID)4049 1.14437 25.13078 0.0455 0.9636810   
## factor(ProdID)4050 82.93587 24.18602 3.4291 0.0006094 \*\*\*  
## factor(ProdID)4051 -0.60956 24.49488 -0.0249 0.9801473   
## factor(ProdID)4052 -0.15721 27.36968 -0.0057 0.9954171   
## factor(ProdID)4053 130.43235 22.94035 5.6857 1.359e-08 \*\*\*  
## factor(ProdID)4055 -10.21429 22.84271 -0.4472 0.6547764   
## factor(ProdID)4056 215.60250 22.85124 9.4350 < 2.2e-16 \*\*\*  
## factor(ProdID)4057 94.55958 22.94324 4.1215 3.812e-05 \*\*\*  
## factor(ProdID)4058 -7.28571 22.84271 -0.3190 0.7497736   
## factor(ProdID)4059 161.74535 22.85124 7.0782 1.614e-12 \*\*\*  
## factor(ProdID)4060 63.82520 22.94035 2.7822 0.0054144 \*\*   
## factor(ProdID)4061 -18.13559 26.02240 -0.6969 0.4858764   
## factor(ProdID)4063 -40.75668 24.76691 -1.6456 0.0998925 .   
## factor(ProdID)4064 180.30519 23.95136 7.5280 5.852e-14 \*\*\*  
## factor(ProdID)4065 39.52648 23.05464 1.7145 0.0864902 .   
## factor(ProdID)4067 -1.67341 29.52056 -0.0567 0.9547968   
## factor(ProdID)4068 151.70964 22.85124 6.6390 3.413e-11 \*\*\*  
## factor(ProdID)4069 26.64286 22.84271 1.1664 0.2435112   
## factor(ProdID)4071 49.00752 23.53173 2.0826 0.0373254 \*   
## factor(ProdID)4072 46.69503 24.77498 1.8848 0.0595061 .   
## factor(ProdID)4073 98.31946 23.63951 4.1591 3.236e-05 \*\*\*  
## factor(ProdID)4074 42.45306 25.04629 1.6950 0.0901264 .   
## factor(ProdID)4075 9.84216 26.81366 0.3671 0.7135879   
## factor(ProdID)4076 152.07003 23.53579 6.4612 1.114e-10 \*\*\*  
## factor(ProdID)4077 33.86465 23.73747 1.4266 0.1537339   
## factor(ProdID)4078 229.54519 23.79098 9.6484 < 2.2e-16 \*\*\*  
## factor(ProdID)4079 18.35524 23.52616 0.7802 0.4352984   
## factor(ProdID)4080 155.11213 23.31431 6.6531 3.104e-11 \*\*\*  
## factor(ProdID)4082 90.07658 23.78198 3.7876 0.0001535 \*\*\*  
## factor(ProdID)4083 18.56467 23.62756 0.7857 0.4320597   
## factor(ProdID)4084 137.63202 23.28978 5.9095 3.604e-09 \*\*\*  
## factor(ProdID)4085 41.70894 23.28978 1.7909 0.0733608 .   
## factor(ProdID)4087 193.15613 23.64341 8.1696 3.688e-16 \*\*\*  
## factor(ProdID)4088 192.18336 23.54771 8.1614 3.942e-16 \*\*\*  
## factor(ProdID)4089 -14.76286 25.53510 -0.5781 0.5631896   
## factor(ProdID)4090 24.92171 23.52200 1.0595 0.2894086   
## factor(ProdID)4092 33.48485 23.89430 1.4014 0.1611499   
## factor(ProdID)4093 20.41876 28.00141 0.7292 0.4659027   
## factor(ProdID)4094 5.84733 28.00141 0.2088 0.8345932   
## factor(ProdID)4095 -45.39267 26.42373 -1.7179 0.0858670 .   
## factor(ProdID)4096 184.37972 24.36974 7.5659 4.384e-14 \*\*\*  
## factor(ProdID)4097 117.54765 23.55091 4.9912 6.156e-07 \*\*\*  
## factor(ProdID)4098 149.70838 23.79487 6.2916 3.346e-10 \*\*\*  
## factor(ProdID)4099 46.51663 23.28978 1.9973 0.0458344 \*   
## factor(ProdID)4100 20.81964 24.07464 0.8648 0.3871828   
## factor(ProdID)4101 -4.70913 23.28069 -0.2023 0.8397071   
## factor(ProdID)4103 65.34138 24.07464 2.7141 0.0066628 \*\*   
## factor(ProdID)4104 -11.62036 24.09347 -0.4823 0.6296067   
## factor(ProdID)4105 45.62693 24.05937 1.8964 0.0579474 .   
## factor(ProdID)4106 74.15149 31.52216 2.3524 0.0186843 \*   
## factor(ProdID)4107 142.92019 23.79098 6.0073 1.988e-09 \*\*\*  
## factor(ProdID)4108 -66.63969 27.13341 -2.4560 0.0140752 \*   
## factor(ProdID)4109 -63.96704 26.59508 -2.4052 0.0161905 \*   
## factor(ProdID)4111 114.30697 24.41886 4.6811 2.911e-06 \*\*\*  
## factor(ProdID)4112 38.44878 23.38827 1.6439 0.1002382   
## factor(ProdID)4113 -38.50052 25.95501 -1.4834 0.1380284   
## factor(ProdID)4114 81.15326 24.18602 3.3554 0.0007971 \*\*\*  
## factor(ProdID)4116 25.69790 24.36974 1.0545 0.2916930   
## factor(ProdID)4117 3.08185 23.81047 0.1294 0.8970192   
## factor(ProdID)4118 242.14350 23.57077 10.2730 < 2.2e-16 \*\*\*  
## factor(ProdID)4119 148.14404 23.31869 6.3530 2.254e-10 \*\*\*  
## factor(ProdID)4120 232.63121 24.69422 9.4205 < 2.2e-16 \*\*\*  
## factor(ProdID)4121 41.95008 24.07464 1.7425 0.0814681 .   
## factor(ProdID)4122 1.64942 24.14668 0.0683 0.9455423   
## factor(ProdID)4123 90.00751 24.06587 3.7400 0.0001856 \*\*\*  
## factor(ProdID)4124 20.16939 23.52535 0.8573 0.3912847   
## factor(ProdID)4125 153.55189 23.84101 6.4407 1.275e-10 \*\*\*  
## factor(ProdID)4127 96.30159 24.14668 3.9882 6.731e-05 \*\*\*  
## factor(ProdID)4128 202.06506 23.90078 8.4543 < 2.2e-16 \*\*\*  
## factor(ProdID)4129 24.00895 23.78119 1.0096 0.3127355   
## factor(ProdID)4131 21.08051 24.07464 0.8756 0.3812627   
## factor(ProdID)4133 85.15125 24.78028 3.4363 0.0005935 \*\*\*  
## factor(ProdID)4135 -17.16177 26.95314 -0.6367 0.5243255   
## factor(ProdID)4141 24.27344 24.06960 1.0085 0.3132669   
## factor(ProdID)4145 44.30958 25.18550 1.7593 0.0785687 .   
## factor(ProdID)4152 15.04804 24.68366 0.6096 0.5421245   
## factor(ProdID)4157 33.36752 23.53173 1.4180 0.1562445   
## factor(ProdID)4158 29.96822 25.95042 1.1548 0.2482041   
## factor(ProdID)4179 154.70326 24.30289 6.3656 2.078e-10 \*\*\*  
## factor(ProdID)4180 47.20306 25.04629 1.8846 0.0595240 .   
## factor(ProdID)4181 8.66709 24.68366 0.3511 0.7255048   
## factor(ProdID)4182 -31.55721 27.36968 -1.1530 0.2489532   
## factor(ProdID)4189 185.27023 23.85365 7.7670 9.282e-15 \*\*\*  
## factor(ProdID)4190 107.65074 23.83702 4.5161 6.410e-06 \*\*\*  
## factor(ProdID)4191 9.20884 24.68306 0.3731 0.7090986   
## factor(ProdID)4193 353.27702 25.05700 14.0989 < 2.2e-16 \*\*\*  
## factor(ProdID)4194 15.09062 24.78336 0.6089 0.5426112   
## factor(ProdID)4195 197.15306 25.04629 7.8715 4.076e-15 \*\*\*  
## factor(ProdID)4202 32.05306 25.04629 1.2798 0.2006778   
## factor(ProdID)4203 26.80306 25.04629 1.0701 0.2845956   
## factor(ProdID)4204 10.33417 26.85451 0.3848 0.7003830   
## factor(ProdID)4205 74.80550 28.01429 2.6703 0.0075981 \*\*   
## factor(ProdID)4206 105.62880 25.84907 4.0864 4.435e-05 \*\*\*  
## factor(ProdID)4207 52.80550 28.01429 1.8849 0.0594813 .   
## factor(ProdID)4208 148.30642 26.33598 5.6313 1.863e-08 \*\*\*  
## factor(ProdID)4209 169.87301 25.87783 6.5644 5.627e-11 \*\*\*  
## factor(ProdID)4210 180.03225 26.54980 6.7809 1.299e-11 \*\*\*  
## factor(ProdID)4211 3.60051 28.00075 0.1286 0.8976891   
## factor(ProdID)4212 105.47414 29.53346 3.5713 0.0003577 \*\*\*  
## factor(ProdID)4213 52.19027 28.93504 1.8037 0.0713238 .   
## factor(ProdID)4214 65.06861 25.85553 2.5166 0.0118724 \*   
## factor(ProdID)4215 46.05943 26.81862 1.7174 0.0859461 .   
## factor(ProdID)4216 41.52580 26.31801 1.5778 0.1146493   
## factor(ProdID)4217 18.13976 26.30975 0.6895 0.4905528   
## factor(ProdID)4218 339.91152 25.42969 13.3667 < 2.2e-16 \*\*\*  
## factor(ProdID)4219 56.17468 25.42969 2.2090 0.0272081 \*   
## factor(ProdID)4220 142.70100 25.42969 5.6116 2.087e-08 \*\*\*  
## factor(ProdID)4225 57.33712 25.90017 2.2138 0.0268789 \*   
## factor(ProdID)4226 64.08417 26.85451 2.3863 0.0170452 \*   
## factor(ProdID)4227 124.42147 27.39334 4.5420 5.672e-06 \*\*\*  
## factor(ProdID)4228 118.89308 25.86675 4.5964 4.380e-06 \*\*\*  
## factor(ProdID)4229 12.43499 26.39774 0.4711 0.6376117   
## factor(ProdID)4230 43.03209 26.82787 1.6040 0.1087611   
## factor(ProdID)4231 95.62762 26.96256 3.5467 0.0003929 \*\*\*  
## factor(ProdID)4232 71.44836 28.01429 2.5504 0.0107819 \*   
## factor(ProdID)4233 112.43784 25.42969 4.4215 9.961e-06 \*\*\*  
## factor(ProdID)4235 42.37506 26.30975 1.6106 0.1073108   
## factor(ProdID)4236 102.68405 38.50486 2.6668 0.0076771 \*\*   
## factor(ProdID)4237 35.59121 28.01429 1.2705 0.2039640   
## factor(ProdID)4238 34.31746 25.87783 1.3261 0.1848421   
## factor(ProdID)4239 72.94836 28.01429 2.6040 0.0092361 \*\*   
## factor(ProdID)4240 54.14080 29.53346 1.8332 0.0668183 .   
## factor(ProdID)4241 50.79415 27.46432 1.8495 0.0644368 .   
## factor(ProdID)4242 0.66901 26.80426 0.0250 0.9800882   
## factor(ProdID)4243 76.66901 26.80426 2.8603 0.0042455 \*\*   
## factor(ProdID)4244 140.86686 30.46081 4.6245 3.827e-06 \*\*\*  
## factor(ProdID)4245 158.56234 26.81157 5.9140 3.510e-09 \*\*\*  
## factor(ProdID)4246 42.20624 26.29635 1.6050 0.1085374   
## factor(ProdID)4247 17.12526 26.29636 0.6512 0.5149142   
## factor(ProdID)4248 50.39080 29.53346 1.7062 0.0880136 .   
## factor(ProdID)4249 24.43443 26.81862 0.9111 0.3622769   
## factor(ProdID)4250 47.37193 26.81862 1.7664 0.0773788 .   
## factor(ProdID)4251 246.29838 28.29899 8.7034 < 2.2e-16 \*\*\*  
## factor(ProdID)4263 21.09121 28.01429 0.7529 0.4515532   
## factor(Wk)2 -26.86719 9.67116 -2.7781 0.0054839 \*\*   
## factor(Wk)3 38.54070 9.54871 4.0362 5.494e-05 \*\*\*  
## factor(Wk)4 52.68161 9.33728 5.6421 1.751e-08 \*\*\*  
## factor(Wk)5 8.98964 9.19116 0.9781 0.3280736   
## factor(Wk)6 35.84977 9.01497 3.9767 7.064e-05 \*\*\*  
## factor(Wk)7 77.68671 8.97424 8.6566 < 2.2e-16 \*\*\*  
## factor(Wk)8 19.59086 8.91940 2.1964 0.0280962 \*   
## factor(Wk)9 -21.95721 8.83122 -2.4863 0.0129323 \*   
## factor(Wk)10 109.78457 8.79555 12.4818 < 2.2e-16 \*\*\*  
## factor(Wk)11 56.84263 8.80317 6.4571 1.145e-10 \*\*\*  
## factor(Wk)12 -5.64004 8.76576 -0.6434 0.5199765   
## factor(Wk)13 -23.40626 8.73153 -2.6807 0.0073663 \*\*   
## factor(Wk)14 49.30263 8.73950 5.6414 1.758e-08 \*\*\*  
## factor(Wk)15 26.28745 8.70663 3.0192 0.0025439 \*\*   
## factor(Wk)16 -11.30461 8.70284 -1.2990 0.1940045   
## factor(Wk)17 -34.36906 8.69058 -3.9547 7.743e-05 \*\*\*  
## factor(Wk)18 40.79593 8.68467 4.6975 2.688e-06 \*\*\*  
## factor(Wk)19 24.66532 8.76322 2.8146 0.0048979 \*\*   
## factor(Wk)20 10.53124 8.80461 1.1961 0.2316989   
## factor(Wk)21 -36.23716 8.83286 -4.1025 4.136e-05 \*\*\*  
## factor(Wk)22 -46.55666 8.91815 -5.2204 1.840e-07 \*\*\*  
## factor(Wk)23 17.46758 8.92165 1.9579 0.0502862 .   
## factor(Wk)24 -15.48644 8.92115 -1.7359 0.0826247 .   
## factor(Wk)25 -26.38142 8.92015 -2.9575 0.0031125 \*\*   
## factor(Wk)26 -54.99058 9.03954 -6.0833 1.244e-09 \*\*\*  
## factor(Wk)27 -54.92968 9.14785 -6.0047 2.021e-09 \*\*\*  
## factor(Wk)28 -86.77755 9.14935 -9.4846 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 106630000  
## Residual Sum of Squares: 47468000  
## R-Squared: 0.55483  
## Adj. R-Squared: 0.53229  
## F-statistic: 24.6162 on 329 and 6498 DF, p-value: < 2.22e-16

# Here, the effect of video in a particular week  
#  
  
model2 <- plm(CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk + FpHomePgWk + FpCatPgWk +  
 CpPriceDiscWk + CpEmailWk + CpCatalogWk + CpHomePgWk + CpCatPgWk + factor(CpordID) + factor(Wk),  
 data = cp\_sales, model = 'pooling', index = c('CpordID', "Wk"))  
summary(model2)

## Pooling Model  
##   
## Call:  
## plm(formula = CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk +   
## FpHomePgWk + FpCatPgWk + CpPriceDiscWk + CpEmailWk + CpCatalogWk +   
## CpHomePgWk + CpCatPgWk + factor(CpordID) + factor(Wk), data = cp\_sales,   
## model = "pooling", index = c("CpordID", "Wk"))  
##   
## Unbalanced Panel: n = 196, T = 8-28, N = 4708  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -936.0016 -22.7554 -2.8461 17.8917 1343.7156   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 0.69714 13.91743 0.0501 0.9600523   
## VidWk 20.57320 4.21829 4.8771 1.114e-06 \*\*\*  
## FpPriceDiscWk -4.19486 5.00108 -0.8388 0.4016315   
## FpEmailWk -6.32944 17.23658 -0.3672 0.7134800   
## FpCatalogWk -9.41676 9.12743 -1.0317 0.3022691   
## FpHomePgWk 13.54771 6.19418 2.1872 0.0287819 \*   
## FpCatPgWk 6.94094 5.57033 1.2461 0.2128092   
## CpPriceDiscWk 89.20361 5.19973 17.1554 < 2.2e-16 \*\*\*  
## CpEmailWk 70.00269 20.21263 3.4633 0.0005386 \*\*\*  
## CpCatalogWk 103.80355 16.82975 6.1679 7.533e-10 \*\*\*  
## CpHomePgWk 64.57818 15.55031 4.1529 3.345e-05 \*\*\*  
## CpCatPgWk 50.93311 14.44994 3.5248 0.0004280 \*\*\*  
## factor(CpordID)1661 32.86512 18.17105 1.8087 0.0705721 .   
## factor(CpordID)1973 9.13760 18.15253 0.5034 0.6147225   
## factor(CpordID)1974 0.39342 18.20158 0.0216 0.9827563   
## factor(CpordID)2143 201.49944 18.21268 11.0637 < 2.2e-16 \*\*\*  
## factor(CpordID)2357 -6.10827 18.13976 -0.3367 0.7363334   
## factor(CpordID)2518 -1.43775 19.63147 -0.0732 0.9416209   
## factor(CpordID)2532 88.36428 20.53903 4.3023 1.727e-05 \*\*\*  
## factor(CpordID)2592 34.23103 20.53899 1.6666 0.0956568 .   
## factor(CpordID)2679 3.44169 18.17973 0.1893 0.8498549   
## factor(CpordID)2690 3.65597 18.17973 0.2011 0.8406283   
## factor(CpordID)2716 108.39874 18.18478 5.9610 2.700e-09 \*\*\*  
## factor(CpordID)2757 131.09517 18.10944 7.2391 5.292e-13 \*\*\*  
## factor(CpordID)2758 240.15585 18.15954 13.2248 < 2.2e-16 \*\*\*  
## factor(CpordID)2759 85.35081 18.46886 4.6213 3.920e-06 \*\*\*  
## factor(CpordID)2763 151.65062 19.60684 7.7346 1.273e-14 \*\*\*  
## factor(CpordID)2841 6.20772 18.16559 0.3417 0.7325706   
## factor(CpordID)2863 14.15597 18.17973 0.7787 0.4362166   
## factor(CpordID)2881 -8.79841 22.79785 -0.3859 0.6995658   
## factor(CpordID)2885 -2.04228 18.16559 -0.1124 0.9104907   
## factor(CpordID)2909 0.15973 20.50576 0.0078 0.9937853   
## factor(CpordID)3025 8.87026 18.17973 0.4879 0.6256302   
## factor(CpordID)3042 27.30305 24.13965 1.1310 0.2580965   
## factor(CpordID)3123 26.85583 18.08343 1.4851 0.1375860   
## factor(CpordID)3124 1.26220 18.15834 0.0695 0.9445862   
## factor(CpordID)3164 129.76284 18.18293 7.1365 1.112e-12 \*\*\*  
## factor(CpordID)3205 17.49986 21.74498 0.8048 0.4209912   
## factor(CpordID)3207 3.10526 20.20926 0.1537 0.8778886   
## factor(CpordID)3209 5.47368 20.20926 0.2709 0.7865189   
## factor(CpordID)3251 87.29509 19.16492 4.5549 5.379e-06 \*\*\*  
## factor(CpordID)3253 126.53493 18.19205 6.9555 4.021e-12 \*\*\*  
## factor(CpordID)3309 983.57219 18.29325 53.7670 < 2.2e-16 \*\*\*  
## factor(CpordID)3317 44.34911 18.19376 2.4376 0.0148238 \*   
## factor(CpordID)3349 5.83440 19.90789 0.2931 0.7694824   
## factor(CpordID)3423 38.62026 18.17973 2.1244 0.0336949 \*   
## factor(CpordID)3435 67.15662 18.20973 3.6880 0.0002287 \*\*\*  
## factor(CpordID)3441 15.45810 19.67476 0.7857 0.4320956   
## factor(CpordID)3446 11.22610 18.17235 0.6178 0.5367668   
## factor(CpordID)3462 20.42685 18.16163 1.1247 0.2607656   
## factor(CpordID)3466 15.33454 18.17973 0.8435 0.3989958   
## factor(CpordID)3474 -1.80831 18.17973 -0.0995 0.9207707   
## factor(CpordID)3479 73.98494 19.45187 3.8035 0.0001446 \*\*\*  
## factor(CpordID)3483 7.12026 18.17973 0.3917 0.6953287   
## factor(CpordID)3484 50.39330 18.19615 2.7694 0.0056383 \*\*   
## factor(CpordID)3485 -16.50998 23.39329 -0.7058 0.4803761   
## factor(CpordID)3487 -11.92561 23.43266 -0.5089 0.6108256   
## factor(CpordID)3490 -12.51704 18.45317 -0.6783 0.4976079   
## factor(CpordID)3492 19.16709 19.62557 0.9766 0.3288009   
## factor(CpordID)3494 56.20177 20.46231 2.7466 0.0060457 \*\*   
## factor(CpordID)3496 44.69699 18.13674 2.4644 0.0137599 \*   
## factor(CpordID)3500 191.88853 18.26250 10.5072 < 2.2e-16 \*\*\*  
## factor(CpordID)3506 26.57548 18.10349 1.4680 0.1421812   
## factor(CpordID)3508 -0.95529 18.10864 -0.0528 0.9579310   
## factor(CpordID)3509 94.93171 24.21657 3.9201 8.983e-05 \*\*\*  
## factor(CpordID)3570 2.35544 22.79785 0.1033 0.9177148   
## factor(CpordID)3573 20.10412 18.15371 1.1074 0.2681637   
## factor(CpordID)3576 78.65035 18.15320 4.3326 1.506e-05 \*\*\*  
## factor(CpordID)3577 11.76312 18.17973 0.6470 0.5176356   
## factor(CpordID)3578 -4.69734 18.08360 -0.2598 0.7950632   
## factor(CpordID)3580 16.94380 18.17962 0.9320 0.3513757   
## factor(CpordID)3585 2.24106 23.43266 0.0956 0.9238123   
## factor(CpordID)3619 30.56646 21.30943 1.4344 0.1515251   
## factor(CpordID)3622 22.32909 18.12092 1.2322 0.2179289   
## factor(CpordID)3627 46.16018 18.24374 2.5302 0.0114340 \*   
## factor(CpordID)3628 63.29621 18.20994 3.4759 0.0005139 \*\*\*  
## factor(CpordID)3671 224.40662 18.20973 12.3234 < 2.2e-16 \*\*\*  
## factor(CpordID)3674 -17.21786 22.36760 -0.7698 0.4414784   
## factor(CpordID)3675 19.44802 22.80553 0.8528 0.3938287   
## factor(CpordID)3678 16.61960 18.20240 0.9130 0.3612683   
## factor(CpordID)3680 98.79853 19.70348 5.0143 5.529e-07 \*\*\*  
## factor(CpordID)3711 10.31578 20.20926 0.5104 0.6097626   
## factor(CpordID)3720 50.74106 23.43266 2.1654 0.0304098 \*   
## factor(CpordID)3721 4.70493 19.81436 0.2375 0.8123181   
## factor(CpordID)3729 67.12090 18.20973 3.6860 0.0002305 \*\*\*  
## factor(CpordID)3749 31.59991 20.20921 1.5636 0.1179731   
## factor(CpordID)3751 67.83427 18.18293 3.7307 0.0001933 \*\*\*  
## factor(CpordID)3765 32.01284 18.18293 1.7606 0.0783747 .   
## factor(CpordID)3812 -2.02260 18.17973 -0.1113 0.9114186   
## factor(CpordID)3815 15.73539 18.16385 0.8663 0.3863705   
## factor(CpordID)3816 13.22740 18.17973 0.7276 0.4669023   
## factor(CpordID)3817 6.65258 18.16269 0.3663 0.7141753   
## factor(CpordID)3818 -3.25041 18.14025 -0.1792 0.8578027   
## factor(CpordID)3821 13.80431 19.69378 0.7009 0.4833721   
## factor(CpordID)3822 10.69986 21.74498 0.4921 0.6227003   
## factor(CpordID)3824 2.01182 18.17235 0.1107 0.9118532   
## factor(CpordID)3829 17.62026 18.17973 0.9692 0.3324851   
## factor(CpordID)3835 13.44169 18.17973 0.7394 0.4597165   
## factor(CpordID)3839 24.31035 18.16889 1.3380 0.1809577   
## factor(CpordID)3842 9.28658 20.53899 0.4521 0.6511872   
## factor(CpordID)3843 6.53399 18.16163 0.3598 0.7190367   
## factor(CpordID)3848 -3.59331 23.39329 -0.1536 0.8779287   
## factor(CpordID)3852 3.05894 18.13744 0.1687 0.8660768   
## factor(CpordID)3854 23.96257 18.16163 1.3194 0.1871009   
## factor(CpordID)3857 21.38235 18.08304 1.1825 0.2370889   
## factor(CpordID)3861 41.18992 18.27774 2.2536 0.0242723 \*   
## factor(CpordID)3864 118.69233 18.20973 6.5181 7.909e-11 \*\*\*  
## factor(CpordID)3866 14.06971 18.16163 0.7747 0.4385613   
## factor(CpordID)3871 57.00396 21.30943 2.6751 0.0074988 \*\*   
## factor(CpordID)3873 293.77628 18.49736 15.8821 < 2.2e-16 \*\*\*  
## factor(CpordID)3875 62.75572 22.80553 2.7518 0.0059512 \*\*   
## factor(CpordID)3876 109.34552 20.90789 5.2299 1.774e-07 \*\*\*  
## factor(CpordID)3877 61.50296 19.81446 3.1039 0.0019215 \*\*   
## factor(CpordID)3878 35.02794 18.15569 1.9293 0.0537557 .   
## factor(CpordID)3880 161.15662 18.20973 8.8500 < 2.2e-16 \*\*\*  
## factor(CpordID)3881 96.98213 18.49646 5.2433 1.650e-07 \*\*\*  
## factor(CpordID)3885 34.14116 21.75340 1.5695 0.1166107   
## factor(CpordID)3886 63.44630 18.12611 3.5003 0.0004693 \*\*\*  
## factor(CpordID)3891 84.10675 20.90856 4.0226 5.851e-05 \*\*\*  
## factor(CpordID)3895 58.05550 18.16369 3.1962 0.0014020 \*\*   
## factor(CpordID)3904 117.82212 18.17428 6.4829 9.971e-11 \*\*\*  
## factor(CpordID)3905 164.22439 20.90856 7.8544 4.993e-15 \*\*\*  
## factor(CpordID)3915 105.83427 18.18293 5.8205 6.276e-09 \*\*\*  
## factor(CpordID)3916 96.05699 24.31996 3.9497 7.945e-05 \*\*\*  
## factor(CpordID)3919 -0.83958 18.51485 -0.0453 0.9638335   
## factor(CpordID)3925 102.47130 18.19626 5.6314 1.896e-08 \*\*\*  
## factor(CpordID)3926 117.18466 18.17253 6.4485 1.250e-10 \*\*\*  
## factor(CpordID)3929 47.29947 18.20973 2.5975 0.0094217 \*\*   
## factor(CpordID)3937 44.53402 19.64371 2.2671 0.0234323 \*   
## factor(CpordID)3938 277.92740 18.31388 15.1758 < 2.2e-16 \*\*\*  
## factor(CpordID)3942 108.11404 18.19955 5.9405 3.057e-09 \*\*\*  
## factor(CpordID)3944 20.34616 18.10625 1.1237 0.2611966   
## factor(CpordID)3949 99.96953 18.16577 5.5032 3.938e-08 \*\*\*  
## factor(CpordID)3954 71.92988 18.23836 3.9439 8.140e-05 \*\*\*  
## factor(CpordID)3955 67.59021 20.55299 3.2886 0.0010147 \*\*   
## factor(CpordID)3959 99.73750 22.25983 4.4806 7.629e-06 \*\*\*  
## factor(CpordID)3960 91.62090 18.20973 5.0314 5.059e-07 \*\*\*  
## factor(CpordID)3961 8.92391 18.26448 0.4886 0.6251532   
## factor(CpordID)3965 86.51047 18.26112 4.7374 2.232e-06 \*\*\*  
## factor(CpordID)3968 27.04947 18.20973 1.4854 0.1374977   
## factor(CpordID)3969 15.09368 18.18473 0.8300 0.4065718   
## factor(CpordID)3970 24.35057 18.16559 1.3405 0.1801580   
## factor(CpordID)3972 37.39881 18.27017 2.0470 0.0407177 \*   
## factor(CpordID)3973 21.67688 19.64371 1.1035 0.2698683   
## factor(CpordID)3974 37.79883 18.17973 2.0792 0.0376582 \*   
## factor(CpordID)3975 5.65506 18.15834 0.3114 0.7554881   
## factor(CpordID)3976 10.56277 18.15028 0.5820 0.5606219   
## factor(CpordID)3978 24.14032 18.09302 1.3342 0.1821951   
## factor(CpordID)3979 55.09978 18.15340 3.0352 0.0024173 \*\*   
## factor(CpordID)3981 1.85260 18.10237 0.1023 0.9184912   
## factor(CpordID)3982 48.49196 18.19376 2.6653 0.0077194 \*\*   
## factor(CpordID)3984 135.26284 18.18293 7.4390 1.209e-13 \*\*\*  
## factor(CpordID)3985 64.86934 18.15834 3.5724 0.0003574 \*\*\*  
## factor(CpordID)3986 45.61934 18.15834 2.5123 0.0120293 \*   
## factor(CpordID)3995 17.31244 20.55299 0.8423 0.3996472   
## factor(CpordID)4001 26.25735 18.15857 1.4460 0.1482464   
## factor(CpordID)4006 145.41625 18.20165 7.9892 1.714e-15 \*\*\*  
## factor(CpordID)4007 123.97713 18.18293 6.8183 1.044e-11 \*\*\*  
## factor(CpordID)4009 105.03171 18.11812 5.7971 7.213e-09 \*\*\*  
## factor(CpordID)4013 5.56764 20.53814 0.2711 0.7863359   
## factor(CpordID)4014 20.29042 18.12675 1.1194 0.2630453   
## factor(CpordID)4015 -6.36960 18.11709 -0.3516 0.7251701   
## factor(CpordID)4016 66.87026 18.17973 3.6783 0.0002376 \*\*\*  
## factor(CpordID)4017 17.53793 18.10144 0.9689 0.3326628   
## factor(CpordID)4019 28.01312 18.17973 1.5409 0.1234123   
## factor(CpordID)4028 18.64449 18.82235 0.9906 0.3219587   
## factor(CpordID)4031 151.33427 18.18293 8.3229 < 2.2e-16 \*\*\*  
## factor(CpordID)4032 34.12026 18.17973 1.8768 0.0606065 .   
## factor(CpordID)4037 39.46750 18.11354 2.1789 0.0293915 \*   
## factor(CpordID)4038 13.74651 18.26025 0.7528 0.4516034   
## factor(CpordID)4040 67.31184 18.15516 3.7076 0.0002118 \*\*\*  
## factor(CpordID)4042 37.24475 18.15253 2.0518 0.0402505 \*   
## factor(CpordID)4043 24.96805 18.18696 1.3729 0.1698664   
## factor(CpordID)4055 23.34817 18.16248 1.2855 0.1986784   
## factor(CpordID)4063 -9.77277 19.68192 -0.4965 0.6195411   
## factor(CpordID)4068 186.61999 18.18293 10.2635 < 2.2e-16 \*\*\*  
## factor(CpordID)4069 59.45623 18.18605 3.2693 0.0010862 \*\*   
## factor(CpordID)4074 79.28413 19.99503 3.9652 7.448e-05 \*\*\*  
## factor(CpordID)4084 174.59441 18.55107 9.4116 < 2.2e-16 \*\*\*  
## factor(CpordID)4088 226.15679 18.81125 12.0224 < 2.2e-16 \*\*\*  
## factor(CpordID)4089 17.25669 20.34869 0.8480 0.3964561   
## factor(CpordID)4118 278.28706 18.79308 14.8080 < 2.2e-16 \*\*\*  
## factor(CpordID)4134 37.50138 19.61305 1.9121 0.0559320 .   
## factor(CpordID)4136 18.10486 21.86678 0.8280 0.4077363   
## factor(CpordID)4137 38.38653 22.97288 1.6709 0.0948016 .   
## factor(CpordID)4140 37.79155 19.92409 1.8968 0.0579217 .   
## factor(CpordID)4142 29.93127 19.64517 1.5236 0.1276807   
## factor(CpordID)4143 36.06686 18.68454 1.9303 0.0536321 .   
## factor(CpordID)4144 60.09255 18.81848 3.1933 0.0014165 \*\*   
## factor(CpordID)4147 -5.12021 19.63313 -0.2608 0.7942631   
## factor(CpordID)4151 75.23739 27.38805 2.7471 0.0060368 \*\*   
## factor(CpordID)4153 46.68289 22.82644 2.0451 0.0409011 \*   
## factor(CpordID)4154 25.31104 19.90377 1.2717 0.2035562   
## factor(CpordID)4155 49.87167 18.64765 2.6744 0.0075131 \*\*   
## factor(CpordID)4156 187.99922 18.75759 10.0226 < 2.2e-16 \*\*\*  
## factor(CpordID)4160 15.84807 22.97288 0.6899 0.4903182   
## factor(CpordID)4162 5.99182 19.88376 0.3013 0.7631674   
## factor(CpordID)4163 21.54959 19.93374 1.0811 0.2797284   
## factor(CpordID)4164 106.66120 19.98939 5.3359 9.978e-08 \*\*\*  
## factor(CpordID)4170 14.01748 19.59064 0.7155 0.4743257   
## factor(CpordID)4178 58.86194 19.94270 2.9516 0.0031782 \*\*   
## factor(CpordID)4190 141.90787 19.00004 7.4688 9.674e-14 \*\*\*  
## factor(CpordID)4191 43.04590 19.65206 2.1904 0.0285465 \*   
## factor(CpordID)4198 38.32629 19.85026 1.9308 0.0535746 .   
## factor(CpordID)4206 141.79086 20.56767 6.8939 6.187e-12 \*\*\*  
## factor(CpordID)4212 136.82888 23.68248 5.7776 8.089e-09 \*\*\*  
## factor(CpordID)4251 273.23231 22.90134 11.9308 < 2.2e-16 \*\*\*  
## factor(Wk)2 -17.13266 7.56556 -2.2646 0.0235873 \*   
## factor(Wk)3 24.60605 7.51679 3.2735 0.0010704 \*\*   
## factor(Wk)4 36.10693 7.48043 4.8269 1.433e-06 \*\*\*  
## factor(Wk)5 12.74297 7.46529 1.7070 0.0878982 .   
## factor(Wk)6 28.16107 7.47510 3.7673 0.0001671 \*\*\*  
## factor(Wk)7 51.82521 7.43927 6.9664 3.724e-12 \*\*\*  
## factor(Wk)8 11.57713 7.40706 1.5630 0.1181263   
## factor(Wk)9 -11.42414 7.31747 -1.5612 0.1185440   
## factor(Wk)10 56.44190 7.29309 7.7391 1.229e-14 \*\*\*  
## factor(Wk)11 24.52031 7.35227 3.3351 0.0008597 \*\*\*  
## factor(Wk)12 -7.68306 7.36835 -1.0427 0.2971385   
## factor(Wk)13 -3.62878 8.17076 -0.4441 0.6569785   
## factor(Wk)14 9.66253 7.47866 1.2920 0.1964193   
## factor(Wk)15 -3.93398 7.48314 -0.5257 0.5991140   
## factor(Wk)16 -17.05904 7.49424 -2.2763 0.0228758 \*   
## factor(Wk)17 -27.44845 7.48001 -3.6696 0.0002458 \*\*\*  
## factor(Wk)18 9.75549 7.51506 1.2981 0.1943115   
## factor(Wk)19 -5.53853 7.60681 -0.7281 0.4665895   
## factor(Wk)20 -3.38526 7.65462 -0.4423 0.6583296   
## factor(Wk)21 -59.02004 8.36106 -7.0589 1.936e-12 \*\*\*  
## factor(Wk)22 -27.80910 7.85040 -3.5424 0.0004006 \*\*\*  
## factor(Wk)23 -4.68942 7.85197 -0.5972 0.5503852   
## factor(Wk)24 -18.82699 7.86471 -2.3939 0.0167132 \*   
## factor(Wk)25 -32.90244 7.87073 -4.1804 2.966e-05 \*\*\*  
## factor(Wk)26 -77.58676 8.98003 -8.6399 < 2.2e-16 \*\*\*  
## factor(Wk)27 -65.23506 9.13191 -7.1436 1.056e-12 \*\*\*  
## factor(Wk)28 -84.00093 9.06904 -9.2624 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 65211000  
## Residual Sum of Squares: 20462000  
## R-Squared: 0.68622  
## Adj. R-Squared: 0.66988  
## F-statistic: 41.993 on 233 and 4474 DF, p-value: < 2.22e-16

## Testing the interaction between video and various promotions for Focal Products ##   
model3 <- plm(Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk + HomePgWk + CatPgWk + I(VidWk\*PriceDiscWk) +  
 factor(ProdID) + factor(Wk), index=c("ProdID", "Wk"), data = fp\_sales, model = 'pooling')  
summary(model3)

## Pooling Model  
##   
## Call:  
## plm(formula = Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk +   
## HomePgWk + CatPgWk + I(VidWk \* PriceDiscWk) + factor(ProdID) +   
## factor(Wk), data = fp\_sales, model = "pooling", index = c("ProdID",   
## "Wk"))  
##   
## Unbalanced Panel: n = 297, T = 2-28, N = 6828  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -647.9130 -37.9829 -3.9456 27.9545 1861.3788   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 23.97865 17.51954 1.3687 0.1711466   
## VidWk 12.41948 5.18913 2.3934 0.0167229 \*   
## PriceDiscWk 68.06806 6.19047 10.9956 < 2.2e-16 \*\*\*  
## EmailWk 68.54836 22.02240 3.1127 0.0018621 \*\*   
## CatalogWk 102.98987 16.99457 6.0602 1.436e-09 \*\*\*  
## HomePgWk 62.67750 9.41556 6.6568 3.027e-11 \*\*\*  
## CatPgWk 26.43913 10.16603 2.6007 0.0093236 \*\*   
## I(VidWk \* PriceDiscWk) 64.50121 15.94995 4.0440 5.316e-05 \*\*\*  
## factor(ProdID)2143 166.68586 22.82541 7.3026 3.159e-13 \*\*\*  
## factor(ProdID)2413 42.90015 22.82541 1.8795 0.0602222 .   
## factor(ProdID)2461 17.66532 22.81970 0.7741 0.4388846   
## factor(ProdID)2532 52.73857 25.80751 2.0435 0.0410396 \*   
## factor(ProdID)2637 21.72158 22.82541 0.9516 0.3413149   
## factor(ProdID)2663 61.43586 22.82541 2.6916 0.0071302 \*\*   
## factor(ProdID)2700 28.54301 22.82541 1.2505 0.2111647   
## factor(ProdID)2716 72.72158 22.82541 3.1860 0.0014494 \*\*   
## factor(ProdID)2800 111.72158 22.82541 4.8946 1.009e-06 \*\*\*  
## factor(ProdID)3133 17.25963 25.38949 0.6798 0.4966590   
## factor(ProdID)3164 93.93586 22.82541 4.1154 3.913e-05 \*\*\*  
## factor(ProdID)3251 52.21785 24.03180 2.1729 0.0298265 \*   
## factor(ProdID)3253 92.96672 22.81684 4.0745 4.667e-05 \*\*\*  
## factor(ProdID)3261 272.51698 25.01038 10.8962 < 2.2e-16 \*\*\*  
## factor(ProdID)3269 90.50766 25.01785 3.6177 0.0002995 \*\*\*  
## factor(ProdID)3292 2.15015 22.82541 0.0942 0.9249534   
## factor(ProdID)3311 95.86443 22.82541 4.1999 2.706e-05 \*\*\*  
## factor(ProdID)3329 42.54301 22.82541 1.8638 0.0623887 .   
## factor(ProdID)3339 94.40015 22.82541 4.1357 3.583e-05 \*\*\*  
## factor(ProdID)3364 61.25729 22.82541 2.6837 0.0072990 \*\*   
## factor(ProdID)3381 57.76986 23.21550 2.4884 0.0128561 \*   
## factor(ProdID)3383 73.48825 23.03736 3.1900 0.0014297 \*\*   
## factor(ProdID)3408 37.67319 22.83651 1.6497 0.0990546 .   
## factor(ProdID)3409 59.44322 22.83821 2.6028 0.0092677 \*\*   
## factor(ProdID)3413 -10.51285 62.66161 -0.1678 0.8667681   
## factor(ProdID)3416 189.68586 22.82541 8.3103 < 2.2e-16 \*\*\*  
## factor(ProdID)3418 166.00729 22.82541 7.2729 3.932e-13 \*\*\*  
## factor(ProdID)3435 32.07872 22.82541 1.4054 0.1599517   
## factor(ProdID)3479 35.64793 24.39105 1.4615 0.1439219   
## factor(ProdID)3511 52.79723 22.81825 2.3138 0.0207089 \*   
## factor(ProdID)3561 29.50000 22.81577 1.2930 0.1960691   
## factor(ProdID)3618 3.22158 22.82541 0.1411 0.8877638   
## factor(ProdID)3619 -4.85831 26.77432 -0.1815 0.8560169   
## factor(ProdID)3642 36.40524 25.80751 1.4106 0.1583971   
## factor(ProdID)3643 104.22158 22.82541 4.5660 5.062e-06 \*\*\*  
## factor(ProdID)3659 -6.42128 22.82541 -0.2813 0.7784728   
## factor(ProdID)3671 189.32872 22.82541 8.2946 < 2.2e-16 \*\*\*  
## factor(ProdID)3677 68.30307 23.03736 2.9649 0.0030390 \*\*   
## factor(ProdID)3678 -17.24271 22.82541 -0.7554 0.4500261   
## factor(ProdID)3680 70.71239 24.76864 2.8549 0.0043185 \*\*   
## factor(ProdID)3696 -7.87647 23.40239 -0.3366 0.7364542   
## factor(ProdID)3701 123.07872 22.82541 5.3922 7.206e-08 \*\*\*  
## factor(ProdID)3723 -24.46017 22.99609 -1.0637 0.2875194   
## factor(ProdID)3727 -9.05392 27.96872 -0.3237 0.7461635   
## factor(ProdID)3728 -7.35831 26.77432 -0.2748 0.7834578   
## factor(ProdID)3729 32.04301 22.82541 1.4038 0.1604172   
## factor(ProdID)3730 -7.87254 25.80751 -0.3050 0.7603391   
## factor(ProdID)3741 45.50729 22.82541 1.9937 0.0462253 \*   
## factor(ProdID)3743 21.72158 22.82541 0.9516 0.3413149   
## factor(ProdID)3745 115.32872 22.82541 5.0526 4.476e-07 \*\*\*  
## factor(ProdID)3746 41.50729 22.82541 1.8185 0.0690386 .   
## factor(ProdID)3747 74.86443 22.82541 3.2799 0.0010440 \*\*   
## factor(ProdID)3749 -4.95090 25.38949 -0.1950 0.8454007   
## factor(ProdID)3751 32.00729 22.82541 1.4023 0.1608837   
## factor(ProdID)3753 19.11443 22.82541 0.8374 0.4023879   
## factor(ProdID)3757 -27.77559 24.68562 -1.1252 0.2605574   
## factor(ProdID)3759 -14.63273 24.68562 -0.5928 0.5533602   
## factor(ProdID)3765 -3.81414 22.82541 -0.1671 0.8672962   
## factor(ProdID)3770 -4.60714 22.81577 -0.2019 0.8399794   
## factor(ProdID)3771 6.88927 28.67922 0.2402 0.8101687   
## factor(ProdID)3778 11.00729 22.82541 0.4822 0.6296528   
## factor(ProdID)3785 18.50465 28.67922 0.6452 0.5188018   
## factor(ProdID)3788 -9.41842 28.67922 -0.3284 0.7426154   
## factor(ProdID)3808 -14.79955 27.33810 -0.5414 0.5882831   
## factor(ProdID)3809 3.36443 22.82541 0.1474 0.8828219   
## factor(ProdID)3810 15.61443 22.82541 0.6841 0.4939483   
## factor(ProdID)3811 51.89286 22.81577 2.2744 0.0229727 \*   
## factor(ProdID)3864 83.61443 22.82541 3.6632 0.0002510 \*\*\*  
## factor(ProdID)3880 126.07872 22.82541 5.5236 3.450e-08 \*\*\*  
## factor(ProdID)3887 405.81649 22.84669 17.7626 < 2.2e-16 \*\*\*  
## factor(ProdID)3888 134.14169 26.77432 5.0101 5.584e-07 \*\*\*  
## factor(ProdID)3889 1.28902 24.75168 0.0521 0.9584681   
## factor(ProdID)3890 -9.19839 30.41970 -0.3024 0.7623700   
## factor(ProdID)3891 64.61443 22.82541 2.8308 0.0046573 \*\*   
## factor(ProdID)3893 82.80678 22.91409 3.6138 0.0003040 \*\*\*  
## factor(ProdID)3894 14.95532 26.31996 0.5682 0.5699105   
## factor(ProdID)3895 24.64286 22.81577 1.0801 0.2801467   
## factor(ProdID)3897 17.96217 23.02745 0.7800 0.4353999   
## factor(ProdID)3898 116.72158 22.82541 5.1137 3.250e-07 \*\*\*  
## factor(ProdID)3902 26.50000 22.81577 1.1615 0.2454906   
## factor(ProdID)3904 84.37960 22.81970 3.6977 0.0002194 \*\*\*  
## factor(ProdID)3905 200.90015 22.82541 8.8016 < 2.2e-16 \*\*\*  
## factor(ProdID)3906 221.22158 22.82541 9.6919 < 2.2e-16 \*\*\*  
## factor(ProdID)3907 135.07515 24.67129 5.4750 4.539e-08 \*\*\*  
## factor(ProdID)3908 32.25792 25.43363 1.2683 0.2047301   
## factor(ProdID)3909 9.82143 22.81577 0.4305 0.6668705   
## factor(ProdID)3911 33.12315 23.49847 1.4096 0.1587094   
## factor(ProdID)3912 89.35714 22.81577 3.9165 9.078e-05 \*\*\*  
## factor(ProdID)3913 -2.88557 22.82541 -0.1264 0.8994042   
## factor(ProdID)3914 53.74550 24.04239 2.2354 0.0254218 \*   
## factor(ProdID)3915 70.00729 22.82541 3.0671 0.0021705 \*\*   
## factor(ProdID)3917 -27.78432 26.77504 -1.0377 0.2994508   
## factor(ProdID)3918 -8.94361 26.26745 -0.3405 0.7335042   
## factor(ProdID)3924 81.05678 22.91409 3.5374 0.0004069 \*\*\*  
## factor(ProdID)3925 69.72580 22.81825 3.0557 0.0022544 \*\*   
## factor(ProdID)3926 83.69009 22.81825 3.6677 0.0002467 \*\*\*  
## factor(ProdID)3927 35.97580 22.81825 1.5766 0.1149307   
## factor(ProdID)3928 22.99608 24.06254 0.9557 0.3392696   
## factor(ProdID)3929 12.22158 22.82541 0.5354 0.5923658   
## factor(ProdID)3930 -45.85184 25.72549 -1.7824 0.0747388 .   
## factor(ProdID)3931 8.09307 29.69476 0.2725 0.7852140   
## factor(ProdID)3932 65.04301 22.82541 2.8496 0.0043914 \*\*   
## factor(ProdID)3933 4.97660 24.74759 0.2011 0.8406312   
## factor(ProdID)3935 10.87587 25.13344 0.4327 0.6652288   
## factor(ProdID)3936 61.47158 22.82541 2.6931 0.0070968 \*\*   
## factor(ProdID)3937 11.64286 22.81577 0.5103 0.6098596   
## factor(ProdID)3938 243.90626 22.96089 10.6227 < 2.2e-16 \*\*\*  
## factor(ProdID)3939 88.56215 23.20344 3.8168 0.0001365 \*\*\*  
## factor(ProdID)3940 35.22893 22.83821 1.5425 0.1229903   
## factor(ProdID)3942 71.61443 22.82541 3.1375 0.0017116 \*\*   
## factor(ProdID)3943 257.61443 22.82541 11.2863 < 2.2e-16 \*\*\*  
## factor(ProdID)3945 95.91393 22.91409 4.1858 2.879e-05 \*\*\*  
## factor(ProdID)3946 74.12092 22.90667 3.2358 0.0012192 \*\*   
## factor(ProdID)3948 218.34733 22.94057 9.5180 < 2.2e-16 \*\*\*  
## factor(ProdID)3950 -10.05036 22.91409 -0.4386 0.6609583   
## factor(ProdID)3951 11.59564 24.74759 0.4686 0.6394024   
## factor(ProdID)3952 -5.51465 22.91409 -0.2407 0.8098214   
## factor(ProdID)3953 166.54301 22.82541 7.2964 3.308e-13 \*\*\*  
## factor(ProdID)3954 35.56604 22.83651 1.5574 0.1194195   
## factor(ProdID)3955 32.06304 22.82821 1.4045 0.1602073   
## factor(ProdID)3956 68.30562 22.93968 2.9776 0.0029157 \*\*   
## factor(ProdID)3959 53.92407 23.25323 2.3190 0.0204263 \*   
## factor(ProdID)3960 56.54301 22.82541 2.4772 0.0132672 \*   
## factor(ProdID)3962 102.56304 22.82821 4.4928 7.150e-06 \*\*\*  
## factor(ProdID)3964 159.72158 22.82541 6.9975 2.866e-12 \*\*\*  
## factor(ProdID)3965 52.49506 22.84669 2.2977 0.0216100 \*   
## factor(ProdID)3966 33.07872 22.82541 1.4492 0.1473284   
## factor(ProdID)3967 133.53814 22.81684 5.8526 5.075e-09 \*\*\*  
## factor(ProdID)3984 99.43586 22.82541 4.3564 1.343e-05 \*\*\*  
## factor(ProdID)3987 162.20183 25.02839 6.4807 9.798e-11 \*\*\*  
## factor(ProdID)3988 109.85766 25.01785 4.3912 1.145e-05 \*\*\*  
## factor(ProdID)3990 67.01152 24.03456 2.7881 0.0053167 \*\*   
## factor(ProdID)3992 75.98535 22.91409 3.3161 0.0009178 \*\*\*  
## factor(ProdID)3993 206.97048 23.07154 8.9708 < 2.2e-16 \*\*\*  
## factor(ProdID)3995 -16.95249 25.81242 -0.6568 0.5113604   
## factor(ProdID)3997 42.75538 22.91721 1.8656 0.0621360 .   
## factor(ProdID)3998 0.18586 22.82541 0.0081 0.9935033   
## factor(ProdID)4002 317.97253 26.04441 12.2089 < 2.2e-16 \*\*\*  
## factor(ProdID)4004 78.20539 23.38342 3.3445 0.0008290 \*\*\*  
## factor(ProdID)4005 95.61443 22.82541 4.1889 2.840e-05 \*\*\*  
## factor(ProdID)4006 110.82872 22.82541 4.8555 1.229e-06 \*\*\*  
## factor(ProdID)4007 88.15015 22.82541 3.8619 0.0001136 \*\*\*  
## factor(ProdID)4008 21.71429 22.81577 0.9517 0.3412731   
## factor(ProdID)4010 691.21611 22.95238 30.1152 < 2.2e-16 \*\*\*  
## factor(ProdID)4011 23.72806 22.90667 1.0359 0.3003068   
## factor(ProdID)4018 13.48268 22.99403 0.5864 0.5576567   
## factor(ProdID)4020 1.94235 22.90667 0.0848 0.9324278   
## factor(ProdID)4021 41.91815 22.90967 1.8297 0.0673385 .   
## factor(ProdID)4022 46.90015 22.82541 2.0547 0.0399446 \*   
## factor(ProdID)4023 123.57872 22.82541 5.4141 6.381e-08 \*\*\*  
## factor(ProdID)4025 11.77107 22.91409 0.5137 0.6074761   
## factor(ProdID)4026 52.47158 22.82541 2.2988 0.0215466 \*   
## factor(ProdID)4027 41.32143 22.81577 1.8111 0.0701730 .   
## factor(ProdID)4030 88.82872 22.82541 3.8917 0.0001006 \*\*\*  
## factor(ProdID)4031 115.50729 22.82541 5.0605 4.297e-07 \*\*\*  
## factor(ProdID)4033 -14.00191 22.90987 -0.6112 0.5411061   
## factor(ProdID)4034 -7.98365 25.80751 -0.3094 0.7570624   
## factor(ProdID)4035 -18.98365 25.80751 -0.7356 0.4620090   
## factor(ProdID)4036 110.67857 22.81577 4.8510 1.257e-06 \*\*\*  
## factor(ProdID)4041 -38.14151 25.50709 -1.4953 0.1348771   
## factor(ProdID)4046 30.54808 25.03574 1.2202 0.2224415   
## factor(ProdID)4047 144.15589 24.76053 5.8220 6.092e-09 \*\*\*  
## factor(ProdID)4049 4.30240 25.11329 0.1713 0.8639777   
## factor(ProdID)4050 84.02314 24.15899 3.4779 0.0005086 \*\*\*  
## factor(ProdID)4051 0.57364 24.46774 0.0234 0.9812963   
## factor(ProdID)4052 -1.07919 27.33835 -0.0395 0.9685127   
## factor(ProdID)4053 131.19964 22.91409 5.7257 1.076e-08 \*\*\*  
## factor(ProdID)4055 -10.21429 22.81577 -0.4477 0.6543953   
## factor(ProdID)4056 214.68586 22.82541 9.4056 < 2.2e-16 \*\*\*  
## factor(ProdID)4057 95.43396 22.91721 4.1643 3.164e-05 \*\*\*  
## factor(ProdID)4058 -7.28571 22.81577 -0.3193 0.7494881   
## factor(ProdID)4059 160.82872 22.82541 7.0460 2.031e-12 \*\*\*  
## factor(ProdID)4060 64.59250 22.91409 2.8189 0.0048334 \*\*   
## factor(ProdID)4061 -16.40666 25.99523 -0.6311 0.5279703   
## factor(ProdID)4063 -37.92817 24.74759 -1.5326 0.1254230   
## factor(ProdID)4064 182.52904 23.92943 7.6278 2.730e-14 \*\*\*  
## factor(ProdID)4065 39.55476 23.02745 1.7177 0.0858949 .   
## factor(ProdID)4067 -2.65049 29.48673 -0.0899 0.9283792   
## factor(ProdID)4068 150.79301 22.82541 6.6064 4.251e-11 \*\*\*  
## factor(ProdID)4069 26.64286 22.81577 1.1677 0.2429551   
## factor(ProdID)4071 48.06888 23.50512 2.0450 0.0408913 \*   
## factor(ProdID)4072 48.94462 24.75201 1.9774 0.0480387 \*   
## factor(ProdID)4073 99.38675 23.61311 4.2090 2.600e-05 \*\*\*  
## factor(ProdID)4074 41.50766 25.01785 1.6591 0.0971394 .   
## factor(ProdID)4075 9.14205 26.78260 0.3413 0.7328565   
## factor(ProdID)4076 151.25132 23.50891 6.4338 1.333e-10 \*\*\*  
## factor(ProdID)4077 35.57598 23.71325 1.5003 0.1335964   
## factor(ProdID)4078 228.59183 23.76409 9.6192 < 2.2e-16 \*\*\*  
## factor(ProdID)4079 18.56315 23.49847 0.7900 0.4295726   
## factor(ProdID)4080 154.18798 23.28794 6.6209 3.855e-11 \*\*\*  
## factor(ProdID)4082 89.83616 23.75401 3.7819 0.0001570 \*\*\*  
## factor(ProdID)4083 20.65858 23.60538 0.8752 0.3815169   
## factor(ProdID)4084 136.70115 23.26345 5.8762 4.405e-09 \*\*\*  
## factor(ProdID)4085 40.77807 23.26345 1.7529 0.0796695 .   
## factor(ProdID)4087 194.15965 23.61683 8.2212 2.411e-16 \*\*\*  
## factor(ProdID)4088 191.23712 23.52110 8.1305 5.080e-16 \*\*\*  
## factor(ProdID)4089 -11.72741 25.51603 -0.4596 0.6458119   
## factor(ProdID)4090 26.38760 23.49706 1.1230 0.2614718   
## factor(ProdID)4092 35.33393 23.87050 1.4802 0.1388592   
## factor(ProdID)4093 19.49110 27.96933 0.6969 0.4859066   
## factor(ProdID)4094 4.91967 27.96933 0.1759 0.8603818   
## factor(ProdID)4095 -41.73481 26.40806 -1.5804 0.1140682   
## factor(ProdID)4096 183.41974 24.34215 7.5351 5.545e-14 \*\*\*  
## factor(ProdID)4097 117.10214 23.52339 4.9781 6.586e-07 \*\*\*  
## factor(ProdID)4098 148.68860 23.76814 6.2558 4.207e-10 \*\*\*  
## factor(ProdID)4099 45.58576 23.26345 1.9595 0.0500917 .   
## factor(ProdID)4100 19.98728 24.04713 0.8312 0.4059074   
## factor(ProdID)4101 -4.65286 23.25323 -0.2001 0.8414125   
## factor(ProdID)4103 64.50902 24.04713 2.6826 0.0073235 \*\*   
## factor(ProdID)4104 -11.54475 24.06506 -0.4797 0.6314350   
## factor(ProdID)4105 45.78010 24.03102 1.9050 0.0568187 .   
## factor(ProdID)4106 73.22434 31.48582 2.3256 0.0200690 \*   
## factor(ProdID)4107 141.96683 23.76409 5.9740 2.437e-09 \*\*\*  
## factor(ProdID)4108 -96.04214 28.05974 -3.4228 0.0006237 \*\*\*  
## factor(ProdID)4109 -91.68335 27.43364 -3.3420 0.0008365 \*\*\*  
## factor(ProdID)4111 113.42066 24.39105 4.6501 3.383e-06 \*\*\*  
## factor(ProdID)4112 39.33137 23.36171 1.6836 0.0923104 .   
## factor(ProdID)4113 -34.91182 25.93959 -1.3459 0.1783851   
## factor(ProdID)4114 82.24054 24.15899 3.4041 0.0006677 \*\*\*  
## factor(ProdID)4116 24.73792 24.34215 1.0163 0.3095441   
## factor(ProdID)4117 2.99863 23.78239 0.1261 0.8996675   
## factor(ProdID)4118 241.26969 23.54396 10.2476 < 2.2e-16 \*\*\*  
## factor(ProdID)4119 147.14455 23.29250 6.3173 2.839e-10 \*\*\*  
## factor(ProdID)4120 231.67884 24.66622 9.3926 < 2.2e-16 \*\*\*  
## factor(ProdID)4121 41.11772 24.04713 1.7099 0.0873357 .   
## factor(ProdID)4122 2.36397 24.11885 0.0980 0.9219247   
## factor(ProdID)4123 90.90462 24.03852 3.7816 0.0001572 \*\*\*  
## factor(ProdID)4124 20.19361 23.49761 0.8594 0.3901570   
## factor(ProdID)4125 153.66220 23.81291 6.4529 1.176e-10 \*\*\*  
## factor(ProdID)4127 97.01614 24.11885 4.0224 5.826e-05 \*\*\*  
## factor(ProdID)4128 202.17649 23.87261 8.4690 < 2.2e-16 \*\*\*  
## factor(ProdID)4129 24.12499 23.75316 1.0157 0.3098321   
## factor(ProdID)4131 20.24815 24.04713 0.8420 0.3998080   
## factor(ProdID)4133 85.60085 24.75130 3.4584 0.0005468 \*\*\*  
## factor(ProdID)4135 -24.51945 26.98276 -0.9087 0.3635380   
## factor(ProdID)4141 23.31072 24.04239 0.9696 0.3322982   
## factor(ProdID)4145 45.30177 25.15700 1.8008 0.0717867 .   
## factor(ProdID)4152 14.91045 24.65457 0.6048 0.5453501   
## factor(ProdID)4157 32.42888 23.50512 1.3797 0.1677414   
## factor(ProdID)4158 33.39035 25.93363 1.2875 0.1979551   
## factor(ProdID)4179 156.38244 24.27778 6.4414 1.269e-10 \*\*\*  
## factor(ProdID)4180 46.25766 25.01785 1.8490 0.0645051 .   
## factor(ProdID)4181 8.52950 24.65457 0.3460 0.7293838   
## factor(ProdID)4182 -32.47919 27.33835 -1.1880 0.2348592   
## factor(ProdID)4189 183.94964 23.82775 7.7200 1.339e-14 \*\*\*  
## factor(ProdID)4190 107.78309 23.80893 4.5270 6.089e-06 \*\*\*  
## factor(ProdID)4191 9.47864 24.65404 0.3845 0.7006456   
## factor(ProdID)4193 352.40183 25.02839 14.0801 < 2.2e-16 \*\*\*  
## factor(ProdID)4194 15.97525 24.75510 0.6453 0.5187349   
## factor(ProdID)4195 196.20766 25.01785 7.8427 5.120e-15 \*\*\*  
## factor(ProdID)4202 31.10766 25.01785 1.2434 0.2137584   
## factor(ProdID)4203 25.85766 25.01785 1.0336 0.3013763   
## factor(ProdID)4204 9.45100 26.82373 0.3523 0.7245968   
## factor(ProdID)4205 73.92565 27.98209 2.6419 0.0082642 \*\*   
## factor(ProdID)4206 104.69073 25.81963 4.0547 5.079e-05 \*\*\*  
## factor(ProdID)4207 51.92565 27.98209 1.8557 0.0635453 .   
## factor(ProdID)4208 147.21247 26.30631 5.5961 2.282e-08 \*\*\*  
## factor(ProdID)4209 168.92439 25.84838 6.5352 6.834e-11 \*\*\*  
## factor(ProdID)4210 181.84316 26.52227 6.8562 7.721e-12 \*\*\*  
## factor(ProdID)4211 4.55392 27.96872 0.1628 0.8706637   
## factor(ProdID)4212 104.57809 29.49947 3.5451 0.0003952 \*\*\*  
## factor(ProdID)4213 46.19524 28.93891 1.5963 0.1104700   
## factor(ProdID)4214 64.04198 25.82628 2.4797 0.0131737 \*   
## factor(ProdID)4215 45.18813 26.78786 1.6869 0.0916728 .   
## factor(ProdID)4216 40.79576 26.28759 1.5519 0.1207344   
## factor(ProdID)4217 17.23335 26.27968 0.6558 0.5119972   
## factor(ProdID)4218 338.97004 25.40077 13.3449 < 2.2e-16 \*\*\*  
## factor(ProdID)4219 55.23320 25.40077 2.1745 0.0297059 \*   
## factor(ProdID)4220 141.75951 25.40077 5.5809 2.489e-08 \*\*\*  
## factor(ProdID)4225 56.13337 25.87133 2.1697 0.0300647 \*   
## factor(ProdID)4226 63.20100 26.82373 2.3562 0.0184945 \*   
## factor(ProdID)4227 123.74697 27.36154 4.5227 6.215e-06 \*\*\*  
## factor(ProdID)4228 118.83729 25.83625 4.5996 4.313e-06 \*\*\*  
## factor(ProdID)4229 13.64957 26.36831 0.5177 0.6047199   
## factor(ProdID)4230 42.34819 26.79677 1.5803 0.1140761   
## factor(ProdID)4231 96.59807 26.93183 3.5868 0.0003373 \*\*\*  
## factor(ProdID)4232 70.56851 27.98209 2.5219 0.0116954 \*   
## factor(ProdID)4233 111.49635 25.40077 4.3895 1.154e-05 \*\*\*  
## factor(ProdID)4235 41.46865 26.27968 1.5780 0.1146203   
## factor(ProdID)4236 102.07785 38.45975 2.6541 0.0079703 \*\*   
## factor(ProdID)4237 34.71136 27.98209 1.2405 0.2148409   
## factor(ProdID)4238 33.36883 25.84838 1.2909 0.1967687   
## factor(ProdID)4239 72.06851 27.98209 2.5755 0.0100308 \*   
## factor(ProdID)4240 53.24476 29.49947 1.8049 0.0711304 .   
## factor(ProdID)4241 51.16852 27.43209 1.8653 0.0621872 .   
## factor(ProdID)4242 0.86712 26.77270 0.0324 0.9741633   
## factor(ProdID)4243 76.86712 26.77270 2.8711 0.0041037 \*\*   
## factor(ProdID)4244 139.93710 30.42575 4.5993 4.320e-06 \*\*\*  
## factor(ProdID)4245 159.19553 26.78041 5.9445 2.917e-09 \*\*\*  
## factor(ProdID)4246 42.80958 26.26576 1.6299 0.1031791   
## factor(ProdID)4247 17.22534 26.26536 0.6558 0.5119632   
## factor(ProdID)4248 49.49476 29.49947 1.6778 0.0934306 .   
## factor(ProdID)4249 23.56313 26.78786 0.8796 0.3790979   
## factor(ProdID)4250 46.50063 26.78786 1.7359 0.0826317 .   
## factor(ProdID)4251 246.51536 28.26566 8.7214 < 2.2e-16 \*\*\*  
## factor(ProdID)4263 20.21136 27.98209 0.7223 0.4701383   
## factor(Wk)2 -26.93161 9.65976 -2.7880 0.0053186 \*\*   
## factor(Wk)3 38.51353 9.53745 4.0381 5.450e-05 \*\*\*  
## factor(Wk)4 52.50320 9.32637 5.6295 1.882e-08 \*\*\*  
## factor(Wk)5 8.96405 9.18032 0.9764 0.3288817   
## factor(Wk)6 36.10905 9.00457 4.0101 6.138e-05 \*\*\*  
## factor(Wk)7 78.04270 8.96408 8.7062 < 2.2e-16 \*\*\*  
## factor(Wk)8 19.91896 8.90925 2.2358 0.0254012 \*   
## factor(Wk)9 -21.70119 8.82104 -2.4602 0.0139132 \*   
## factor(Wk)10 110.02378 8.78538 12.5235 < 2.2e-16 \*\*\*  
## factor(Wk)11 57.55520 8.79456 6.5444 6.429e-11 \*\*\*  
## factor(Wk)12 -4.93552 8.75716 -0.5636 0.5730468   
## factor(Wk)13 -23.34509 8.72125 -2.6768 0.0074514 \*\*   
## factor(Wk)14 49.33676 8.72920 5.6519 1.654e-08 \*\*\*  
## factor(Wk)15 26.25978 8.69637 3.0196 0.0025407 \*\*   
## factor(Wk)16 -11.23905 8.69259 -1.2929 0.1960755   
## factor(Wk)17 -34.60763 8.68053 -3.9868 6.770e-05 \*\*\*  
## factor(Wk)18 40.62309 8.67454 4.6830 2.884e-06 \*\*\*  
## factor(Wk)19 24.38272 8.75317 2.7856 0.0053586 \*\*   
## factor(Wk)20 10.24212 8.79451 1.1646 0.2442224   
## factor(Wk)21 -36.38750 8.82252 -4.1244 3.764e-05 \*\*\*  
## factor(Wk)22 -46.73907 8.90775 -5.2470 1.595e-07 \*\*\*  
## factor(Wk)23 17.26227 8.91128 1.9371 0.0527732 .   
## factor(Wk)24 -15.68664 8.91077 -1.7604 0.0783847 .   
## factor(Wk)25 -26.59459 8.90979 -2.9849 0.0028475 \*\*   
## factor(Wk)26 -54.18612 9.03107 -6.0000 2.080e-09 \*\*\*  
## factor(Wk)27 -53.90484 9.14057 -5.8973 3.880e-09 \*\*\*  
## factor(Wk)28 -85.08468 9.14815 -9.3008 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 106630000  
## Residual Sum of Squares: 47349000  
## R-Squared: 0.55595  
## Adj. R-Squared: 0.5334  
## F-statistic: 24.6492 on 330 and 6497 DF, p-value: < 2.22e-16

model4 <- plm(Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk + HomePgWk + CatPgWk + I(VidWk\*EmailWk) +  
 factor(ProdID) + factor(Wk), index=c("ProdID", "Wk"), data = fp\_sales, model = 'pooling')  
summary(model4)

## Pooling Model  
##   
## Call:  
## plm(formula = Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk +   
## HomePgWk + CatPgWk + I(VidWk \* EmailWk) + factor(ProdID) +   
## factor(Wk), data = fp\_sales, model = "pooling", index = c("ProdID",   
## "Wk"))  
##   
## Unbalanced Panel: n = 297, T = 2-28, N = 6828  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -649.5517 -38.1418 -4.2166 28.2288 1890.3086   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 23.21490 17.53921 1.3236 0.1856823   
## VidWk 16.70583 5.08573 3.2848 0.0010258 \*\*   
## PriceDiscWk 76.62329 5.82463 13.1550 < 2.2e-16 \*\*\*  
## EmailWk 68.91290 22.04821 3.1256 0.0017825 \*\*   
## CatalogWk 103.80028 17.01345 6.1011 1.114e-09 \*\*\*  
## HomePgWk 61.08341 9.41841 6.4855 9.492e-11 \*\*\*  
## CatPgWk 29.43734 10.15093 2.9000 0.0037446 \*\*   
## factor(ProdID)2143 167.60250 22.85124 7.3345 2.496e-13 \*\*\*  
## factor(ProdID)2413 43.81678 22.85124 1.9175 0.0552208 .   
## factor(ProdID)2461 17.86378 22.84660 0.7819 0.4343010   
## factor(ProdID)2532 53.62909 25.83704 2.0757 0.0379640 \*   
## factor(ProdID)2637 22.63821 22.85124 0.9907 0.3218799   
## factor(ProdID)2663 62.35250 22.85124 2.7286 0.0063770 \*\*   
## factor(ProdID)2700 29.45964 22.85124 1.2892 0.1973771   
## factor(ProdID)2716 73.63821 22.85124 3.2225 0.0012770 \*\*   
## factor(ProdID)2800 112.63821 22.85124 4.9292 8.462e-07 \*\*\*  
## factor(ProdID)3133 18.12860 25.41856 0.7132 0.4757456   
## factor(ProdID)3164 94.85250 22.85124 4.1509 3.354e-05 \*\*\*  
## factor(ProdID)3251 52.43663 24.06011 2.1794 0.0293377 \*   
## factor(ProdID)3253 93.27226 22.84366 4.0831 4.498e-05 \*\*\*  
## factor(ProdID)3261 272.68656 25.03987 10.8901 < 2.2e-16 \*\*\*  
## factor(ProdID)3269 91.45306 25.04629 3.6514 0.0002629 \*\*\*  
## factor(ProdID)3292 3.06678 22.85124 0.1342 0.8932435   
## factor(ProdID)3311 96.78107 22.85124 4.2353 2.314e-05 \*\*\*  
## factor(ProdID)3329 43.45964 22.85124 1.9019 0.0572349 .   
## factor(ProdID)3339 95.31678 22.85124 4.1712 3.070e-05 \*\*\*  
## factor(ProdID)3364 62.17392 22.85124 2.7208 0.0065295 \*\*   
## factor(ProdID)3381 55.16556 23.23396 2.3743 0.0176088 \*   
## factor(ProdID)3383 74.41055 23.06343 3.2263 0.0012600 \*\*   
## factor(ProdID)3408 38.70368 22.86206 1.6929 0.0905182 .   
## factor(ProdID)3409 60.36663 22.86403 2.6402 0.0083044 \*\*   
## factor(ProdID)3413 -9.78131 62.73534 -0.1559 0.8761058   
## factor(ProdID)3416 190.60250 22.85124 8.3410 < 2.2e-16 \*\*\*  
## factor(ProdID)3418 166.92392 22.85124 7.3048 3.109e-13 \*\*\*  
## factor(ProdID)3435 32.99535 22.85124 1.4439 0.1488097   
## factor(ProdID)3479 36.53424 24.41886 1.4961 0.1346635   
## factor(ProdID)3511 52.85416 22.84519 2.3136 0.0207218 \*   
## factor(ProdID)3561 29.50000 22.84271 1.2914 0.1965970   
## factor(ProdID)3618 4.13821 22.85124 0.1811 0.8562998   
## factor(ProdID)3619 -3.92623 26.80494 -0.1465 0.8835515   
## factor(ProdID)3642 37.29575 25.83704 1.4435 0.1489280   
## factor(ProdID)3643 105.13821 22.85124 4.6010 4.285e-06 \*\*\*  
## factor(ProdID)3659 -5.50465 22.85124 -0.2409 0.8096475   
## factor(ProdID)3671 190.24535 22.85124 8.3254 < 2.2e-16 \*\*\*  
## factor(ProdID)3677 69.22536 23.06343 3.0015 0.0026966 \*\*   
## factor(ProdID)3678 -16.32608 22.85124 -0.7145 0.4749743   
## factor(ProdID)3680 67.86652 24.78787 2.7379 0.0062003 \*\*   
## factor(ProdID)3696 -11.24620 23.41517 -0.4803 0.6310336   
## factor(ProdID)3701 123.99535 22.85124 5.4262 5.965e-08 \*\*\*  
## factor(ProdID)3723 -28.43224 23.00223 -1.2361 0.2164793   
## factor(ProdID)3727 -8.10051 28.00075 -0.2893 0.7723640   
## factor(ProdID)3728 -6.42623 26.80494 -0.2397 0.8105389   
## factor(ProdID)3729 32.95964 22.85124 1.4424 0.1492499   
## factor(ProdID)3730 -6.98202 25.83704 -0.2702 0.7869895   
## factor(ProdID)3741 46.42392 22.85124 2.0316 0.0422376 \*   
## factor(ProdID)3743 22.63821 22.85124 0.9907 0.3218799   
## factor(ProdID)3745 116.24535 22.85124 5.0870 3.739e-07 \*\*\*  
## factor(ProdID)3746 42.42392 22.85124 1.8565 0.0634238 .   
## factor(ProdID)3747 75.78107 22.85124 3.3163 0.0009173 \*\*\*  
## factor(ProdID)3749 -4.08193 25.41856 -0.1606 0.8724225   
## factor(ProdID)3751 32.92392 22.85124 1.4408 0.1496911   
## factor(ProdID)3753 20.03107 22.85124 0.8766 0.3807441   
## factor(ProdID)3757 -29.38192 24.71157 -1.1890 0.2344852   
## factor(ProdID)3759 -16.23906 24.71157 -0.6571 0.5111115   
## factor(ProdID)3765 -2.89750 22.85124 -0.1268 0.8991037   
## factor(ProdID)3770 -4.60714 22.84271 -0.2017 0.8401655   
## factor(ProdID)3771 7.85465 28.71208 0.2736 0.7844269   
## factor(ProdID)3778 11.92392 22.85124 0.5218 0.6018228   
## factor(ProdID)3785 19.47003 28.71208 0.6781 0.4977243   
## factor(ProdID)3788 -8.45304 28.71208 -0.2944 0.7684562   
## factor(ProdID)3808 -13.86063 27.36940 -0.5064 0.6125734   
## factor(ProdID)3809 4.28107 22.85124 0.1873 0.8513959   
## factor(ProdID)3810 16.53107 22.85124 0.7234 0.4694472   
## factor(ProdID)3811 51.89286 22.84271 2.2717 0.0231344 \*   
## factor(ProdID)3864 84.53107 22.85124 3.6992 0.0002181 \*\*\*  
## factor(ProdID)3880 126.99535 22.85124 5.5575 2.846e-08 \*\*\*  
## factor(ProdID)3887 406.72689 22.87256 17.7823 < 2.2e-16 \*\*\*  
## factor(ProdID)3888 135.07377 26.80494 5.0391 4.803e-07 \*\*\*  
## factor(ProdID)3889 -1.68226 24.76998 -0.0679 0.9458551   
## factor(ProdID)3890 -8.65563 30.45532 -0.2842 0.7762605   
## factor(ProdID)3891 65.53107 22.85124 2.8677 0.0041477 \*\*   
## factor(ProdID)3893 82.03949 22.94035 3.5762 0.0003511 \*\*\*  
## factor(ProdID)3894 16.13460 26.34942 0.6123 0.5403393   
## factor(ProdID)3895 24.64286 22.84271 1.0788 0.2807142   
## factor(ProdID)3897 17.93389 23.05464 0.7779 0.4366644   
## factor(ProdID)3898 117.63821 22.85124 5.1480 2.710e-07 \*\*\*  
## factor(ProdID)3902 26.50000 22.84271 1.1601 0.2460477   
## factor(ProdID)3904 84.57807 22.84660 3.7020 0.0002157 \*\*\*  
## factor(ProdID)3905 201.81678 22.85124 8.8318 < 2.2e-16 \*\*\*  
## factor(ProdID)3906 222.13821 22.85124 9.7211 < 2.2e-16 \*\*\*  
## factor(ProdID)3907 136.10343 24.69911 5.5105 3.716e-08 \*\*\*  
## factor(ProdID)3908 33.37859 25.46215 1.3109 0.1899346   
## factor(ProdID)3909 9.82143 22.84271 0.4300 0.6672398   
## factor(ProdID)3911 32.91524 23.52616 1.3991 0.1618335   
## factor(ProdID)3912 89.35714 22.84271 3.9118 9.253e-05 \*\*\*  
## factor(ProdID)3913 -1.96893 22.85124 -0.0862 0.9313394   
## factor(ProdID)3914 54.70822 24.06960 2.2729 0.0230636 \*   
## factor(ProdID)3915 70.92392 22.85124 3.1037 0.0019192 \*\*   
## factor(ProdID)3917 -26.88990 26.80574 -1.0031 0.3158309   
## factor(ProdID)3918 -8.05847 26.29756 -0.3064 0.7592838   
## factor(ProdID)3924 80.28949 22.94035 3.4999 0.0004685 \*\*\*  
## factor(ProdID)3925 69.78274 22.84519 3.0546 0.0022628 \*\*   
## factor(ProdID)3926 83.74702 22.84519 3.6658 0.0002485 \*\*\*  
## factor(ProdID)3927 36.03274 22.84519 1.5773 0.1147851   
## factor(ProdID)3928 23.05083 24.09095 0.9568 0.3386911   
## factor(ProdID)3929 13.13821 22.85124 0.5749 0.5653482   
## factor(ProdID)3930 -24.76737 25.22136 -0.9820 0.3261364   
## factor(ProdID)3931 3.24185 29.70555 0.1091 0.9131005   
## factor(ProdID)3932 65.95964 22.85124 2.8865 0.0039086 \*\*   
## factor(ProdID)3933 2.14809 24.76691 0.0867 0.9308871   
## factor(ProdID)3935 9.58194 25.16107 0.3808 0.7033462   
## factor(ProdID)3936 62.38821 22.85124 2.7302 0.0063468 \*\*   
## factor(ProdID)3937 11.64286 22.84271 0.5097 0.6102812   
## factor(ProdID)3938 243.80931 22.98799 10.6059 < 2.2e-16 \*\*\*  
## factor(ProdID)3939 90.01092 23.22807 3.8751 0.0001076 \*\*\*  
## factor(ProdID)3940 36.15235 22.86403 1.5812 0.1138836   
## factor(ProdID)3942 72.53107 22.85124 3.1741 0.0015103 \*\*   
## factor(ProdID)3943 258.53107 22.85124 11.3137 < 2.2e-16 \*\*\*  
## factor(ProdID)3945 95.14663 22.94035 4.1476 3.403e-05 \*\*\*  
## factor(ProdID)3946 72.43699 22.92992 3.1591 0.0015900 \*\*   
## factor(ProdID)3948 217.90317 22.96740 9.4875 < 2.2e-16 \*\*\*  
## factor(ProdID)3950 -10.81765 22.94035 -0.4716 0.6372598   
## factor(ProdID)3951 8.76713 24.76691 0.3540 0.7233610   
## factor(ProdID)3952 -6.28194 22.94035 -0.2738 0.7842179   
## factor(ProdID)3953 167.45964 22.85124 7.3283 2.614e-13 \*\*\*  
## factor(ProdID)3954 36.59654 22.86206 1.6008 0.1094799   
## factor(ProdID)3955 32.87259 22.85429 1.4384 0.1503814   
## factor(ProdID)3956 67.70912 22.96629 2.9482 0.0032077 \*\*   
## factor(ProdID)3959 53.86779 23.28069 2.3138 0.0207075 \*   
## factor(ProdID)3960 57.45964 22.85124 2.5145 0.0119438 \*   
## factor(ProdID)3962 103.37259 22.85429 4.5231 6.202e-06 \*\*\*  
## factor(ProdID)3964 160.63821 22.85124 7.0297 2.281e-12 \*\*\*  
## factor(ProdID)3965 53.40546 22.87256 2.3349 0.0195782 \*   
## factor(ProdID)3966 33.99535 22.85124 1.4877 0.1368835   
## factor(ProdID)3967 133.84369 22.84366 5.8591 4.881e-09 \*\*\*  
## factor(ProdID)3984 100.35250 22.85124 4.3916 1.143e-05 \*\*\*  
## factor(ProdID)3987 163.07702 25.05700 6.5082 8.171e-11 \*\*\*  
## factor(ProdID)3988 110.80306 25.04629 4.4239 9.850e-06 \*\*\*  
## factor(ProdID)3990 66.92765 24.06293 2.7814 0.0054288 \*\*   
## factor(ProdID)3992 75.21806 22.94035 3.2789 0.0010478 \*\*   
## factor(ProdID)3993 207.83275 23.09779 8.9979 < 2.2e-16 \*\*\*  
## factor(ProdID)3995 -16.22854 25.84228 -0.6280 0.5300363   
## factor(ProdID)3997 41.88101 22.94324 1.8254 0.0679838 .   
## factor(ProdID)3998 1.10250 22.85124 0.0482 0.9615211   
## factor(ProdID)4002 338.17883 25.59079 13.2149 < 2.2e-16 \*\*\*  
## factor(ProdID)4004 80.82988 23.40201 3.4540 0.0005559 \*\*\*  
## factor(ProdID)4005 96.53107 22.85124 4.2243 2.429e-05 \*\*\*  
## factor(ProdID)4006 111.74535 22.85124 4.8901 1.032e-06 \*\*\*  
## factor(ProdID)4007 89.06678 22.85124 3.8977 9.810e-05 \*\*\*  
## factor(ProdID)4008 21.71429 22.84271 0.9506 0.3418427   
## factor(ProdID)4010 689.58816 22.97595 30.0135 < 2.2e-16 \*\*\*  
## factor(ProdID)4011 22.04414 22.92992 0.9614 0.3364020   
## factor(ProdID)4018 11.72162 23.01705 0.5093 0.6105886   
## factor(ProdID)4020 0.25842 22.92992 0.0113 0.9910083   
## factor(ProdID)4021 40.29116 22.93319 1.7569 0.0789831 .   
## factor(ProdID)4022 47.81678 22.85124 2.0925 0.0364303 \*   
## factor(ProdID)4023 124.49535 22.85124 5.4481 5.279e-08 \*\*\*  
## factor(ProdID)4025 11.00378 22.94035 0.4797 0.6314790   
## factor(ProdID)4026 53.38821 22.85124 2.3363 0.0195039 \*   
## factor(ProdID)4027 41.32143 22.84271 1.8090 0.0705043 .   
## factor(ProdID)4030 89.74535 22.85124 3.9274 8.677e-05 \*\*\*  
## factor(ProdID)4031 116.42392 22.85124 5.0949 3.588e-07 \*\*\*  
## factor(ProdID)4033 -15.79291 22.93264 -0.6887 0.4910585   
## factor(ProdID)4034 -7.09313 25.83704 -0.2745 0.7836833   
## factor(ProdID)4035 -18.09313 25.83704 -0.7003 0.4837782   
## factor(ProdID)4036 110.67857 22.84271 4.8452 1.294e-06 \*\*\*  
## factor(ProdID)4041 -15.42006 24.90996 -0.6190 0.5359171   
## factor(ProdID)4046 30.04206 25.06499 1.1986 0.2307403   
## factor(ProdID)4047 148.19205 24.76962 5.9828 2.310e-09 \*\*\*  
## factor(ProdID)4049 1.14437 25.13078 0.0455 0.9636810   
## factor(ProdID)4050 82.93587 24.18602 3.4291 0.0006094 \*\*\*  
## factor(ProdID)4051 -0.60956 24.49488 -0.0249 0.9801473   
## factor(ProdID)4052 -0.15721 27.36968 -0.0057 0.9954171   
## factor(ProdID)4053 130.43235 22.94035 5.6857 1.359e-08 \*\*\*  
## factor(ProdID)4055 -10.21429 22.84271 -0.4472 0.6547764   
## factor(ProdID)4056 215.60250 22.85124 9.4350 < 2.2e-16 \*\*\*  
## factor(ProdID)4057 94.55958 22.94324 4.1215 3.812e-05 \*\*\*  
## factor(ProdID)4058 -7.28571 22.84271 -0.3190 0.7497736   
## factor(ProdID)4059 161.74535 22.85124 7.0782 1.614e-12 \*\*\*  
## factor(ProdID)4060 63.82520 22.94035 2.7822 0.0054144 \*\*   
## factor(ProdID)4061 -18.13559 26.02240 -0.6969 0.4858764   
## factor(ProdID)4063 -40.75668 24.76691 -1.6456 0.0998925 .   
## factor(ProdID)4064 180.30519 23.95136 7.5280 5.852e-14 \*\*\*  
## factor(ProdID)4065 39.52648 23.05464 1.7145 0.0864902 .   
## factor(ProdID)4067 -1.67341 29.52056 -0.0567 0.9547968   
## factor(ProdID)4068 151.70964 22.85124 6.6390 3.413e-11 \*\*\*  
## factor(ProdID)4069 26.64286 22.84271 1.1664 0.2435112   
## factor(ProdID)4071 49.00752 23.53173 2.0826 0.0373254 \*   
## factor(ProdID)4072 46.69503 24.77498 1.8848 0.0595061 .   
## factor(ProdID)4073 98.31946 23.63951 4.1591 3.236e-05 \*\*\*  
## factor(ProdID)4074 42.45306 25.04629 1.6950 0.0901264 .   
## factor(ProdID)4075 9.84216 26.81366 0.3671 0.7135879   
## factor(ProdID)4076 152.07003 23.53579 6.4612 1.114e-10 \*\*\*  
## factor(ProdID)4077 33.86465 23.73747 1.4266 0.1537339   
## factor(ProdID)4078 229.54519 23.79098 9.6484 < 2.2e-16 \*\*\*  
## factor(ProdID)4079 18.35524 23.52616 0.7802 0.4352984   
## factor(ProdID)4080 155.11213 23.31431 6.6531 3.104e-11 \*\*\*  
## factor(ProdID)4082 90.07658 23.78198 3.7876 0.0001535 \*\*\*  
## factor(ProdID)4083 18.56467 23.62756 0.7857 0.4320597   
## factor(ProdID)4084 137.63202 23.28978 5.9095 3.604e-09 \*\*\*  
## factor(ProdID)4085 41.70894 23.28978 1.7909 0.0733608 .   
## factor(ProdID)4087 193.15613 23.64341 8.1696 3.688e-16 \*\*\*  
## factor(ProdID)4088 192.18336 23.54771 8.1614 3.942e-16 \*\*\*  
## factor(ProdID)4089 -14.76286 25.53510 -0.5781 0.5631896   
## factor(ProdID)4090 24.92171 23.52200 1.0595 0.2894086   
## factor(ProdID)4092 33.48485 23.89430 1.4014 0.1611499   
## factor(ProdID)4093 20.41876 28.00141 0.7292 0.4659027   
## factor(ProdID)4094 5.84733 28.00141 0.2088 0.8345932   
## factor(ProdID)4095 -45.39267 26.42373 -1.7179 0.0858670 .   
## factor(ProdID)4096 184.37972 24.36974 7.5659 4.384e-14 \*\*\*  
## factor(ProdID)4097 117.54765 23.55091 4.9912 6.156e-07 \*\*\*  
## factor(ProdID)4098 149.70838 23.79487 6.2916 3.346e-10 \*\*\*  
## factor(ProdID)4099 46.51663 23.28978 1.9973 0.0458344 \*   
## factor(ProdID)4100 20.81964 24.07464 0.8648 0.3871828   
## factor(ProdID)4101 -4.70913 23.28069 -0.2023 0.8397071   
## factor(ProdID)4103 65.34138 24.07464 2.7141 0.0066628 \*\*   
## factor(ProdID)4104 -11.62036 24.09347 -0.4823 0.6296067   
## factor(ProdID)4105 45.62693 24.05937 1.8964 0.0579474 .   
## factor(ProdID)4106 74.15149 31.52216 2.3524 0.0186843 \*   
## factor(ProdID)4107 142.92019 23.79098 6.0073 1.988e-09 \*\*\*  
## factor(ProdID)4108 -66.63969 27.13341 -2.4560 0.0140752 \*   
## factor(ProdID)4109 -63.96704 26.59508 -2.4052 0.0161905 \*   
## factor(ProdID)4111 114.30697 24.41886 4.6811 2.911e-06 \*\*\*  
## factor(ProdID)4112 38.44878 23.38827 1.6439 0.1002382   
## factor(ProdID)4113 -38.50052 25.95501 -1.4834 0.1380284   
## factor(ProdID)4114 81.15326 24.18602 3.3554 0.0007971 \*\*\*  
## factor(ProdID)4116 25.69790 24.36974 1.0545 0.2916930   
## factor(ProdID)4117 3.08185 23.81047 0.1294 0.8970192   
## factor(ProdID)4118 242.14350 23.57077 10.2730 < 2.2e-16 \*\*\*  
## factor(ProdID)4119 148.14404 23.31869 6.3530 2.254e-10 \*\*\*  
## factor(ProdID)4120 232.63121 24.69422 9.4205 < 2.2e-16 \*\*\*  
## factor(ProdID)4121 41.95008 24.07464 1.7425 0.0814681 .   
## factor(ProdID)4122 1.64942 24.14668 0.0683 0.9455423   
## factor(ProdID)4123 90.00751 24.06587 3.7400 0.0001856 \*\*\*  
## factor(ProdID)4124 20.16939 23.52535 0.8573 0.3912847   
## factor(ProdID)4125 153.55189 23.84101 6.4407 1.275e-10 \*\*\*  
## factor(ProdID)4127 96.30159 24.14668 3.9882 6.731e-05 \*\*\*  
## factor(ProdID)4128 202.06506 23.90078 8.4543 < 2.2e-16 \*\*\*  
## factor(ProdID)4129 24.00895 23.78119 1.0096 0.3127355   
## factor(ProdID)4131 21.08051 24.07464 0.8756 0.3812627   
## factor(ProdID)4133 85.15125 24.78028 3.4363 0.0005935 \*\*\*  
## factor(ProdID)4135 -17.16177 26.95314 -0.6367 0.5243255   
## factor(ProdID)4141 24.27344 24.06960 1.0085 0.3132669   
## factor(ProdID)4145 44.30958 25.18550 1.7593 0.0785687 .   
## factor(ProdID)4152 15.04804 24.68366 0.6096 0.5421245   
## factor(ProdID)4157 33.36752 23.53173 1.4180 0.1562445   
## factor(ProdID)4158 29.96822 25.95042 1.1548 0.2482041   
## factor(ProdID)4179 154.70326 24.30289 6.3656 2.078e-10 \*\*\*  
## factor(ProdID)4180 47.20306 25.04629 1.8846 0.0595240 .   
## factor(ProdID)4181 8.66709 24.68366 0.3511 0.7255048   
## factor(ProdID)4182 -31.55721 27.36968 -1.1530 0.2489532   
## factor(ProdID)4189 185.27023 23.85365 7.7670 9.282e-15 \*\*\*  
## factor(ProdID)4190 107.65074 23.83702 4.5161 6.410e-06 \*\*\*  
## factor(ProdID)4191 9.20884 24.68306 0.3731 0.7090986   
## factor(ProdID)4193 353.27702 25.05700 14.0989 < 2.2e-16 \*\*\*  
## factor(ProdID)4194 15.09062 24.78336 0.6089 0.5426112   
## factor(ProdID)4195 197.15306 25.04629 7.8715 4.076e-15 \*\*\*  
## factor(ProdID)4202 32.05306 25.04629 1.2798 0.2006778   
## factor(ProdID)4203 26.80306 25.04629 1.0701 0.2845956   
## factor(ProdID)4204 10.33417 26.85451 0.3848 0.7003830   
## factor(ProdID)4205 74.80550 28.01429 2.6703 0.0075981 \*\*   
## factor(ProdID)4206 105.62880 25.84907 4.0864 4.435e-05 \*\*\*  
## factor(ProdID)4207 52.80550 28.01429 1.8849 0.0594813 .   
## factor(ProdID)4208 148.30642 26.33598 5.6313 1.863e-08 \*\*\*  
## factor(ProdID)4209 169.87301 25.87783 6.5644 5.627e-11 \*\*\*  
## factor(ProdID)4210 180.03225 26.54980 6.7809 1.299e-11 \*\*\*  
## factor(ProdID)4211 3.60051 28.00075 0.1286 0.8976891   
## factor(ProdID)4212 105.47414 29.53346 3.5713 0.0003577 \*\*\*  
## factor(ProdID)4213 52.19027 28.93504 1.8037 0.0713238 .   
## factor(ProdID)4214 65.06861 25.85553 2.5166 0.0118724 \*   
## factor(ProdID)4215 46.05943 26.81862 1.7174 0.0859461 .   
## factor(ProdID)4216 41.52580 26.31801 1.5778 0.1146493   
## factor(ProdID)4217 18.13976 26.30975 0.6895 0.4905528   
## factor(ProdID)4218 339.91152 25.42969 13.3667 < 2.2e-16 \*\*\*  
## factor(ProdID)4219 56.17468 25.42969 2.2090 0.0272081 \*   
## factor(ProdID)4220 142.70100 25.42969 5.6116 2.087e-08 \*\*\*  
## factor(ProdID)4225 57.33712 25.90017 2.2138 0.0268789 \*   
## factor(ProdID)4226 64.08417 26.85451 2.3863 0.0170452 \*   
## factor(ProdID)4227 124.42147 27.39334 4.5420 5.672e-06 \*\*\*  
## factor(ProdID)4228 118.89308 25.86675 4.5964 4.380e-06 \*\*\*  
## factor(ProdID)4229 12.43499 26.39774 0.4711 0.6376117   
## factor(ProdID)4230 43.03209 26.82787 1.6040 0.1087611   
## factor(ProdID)4231 95.62762 26.96256 3.5467 0.0003929 \*\*\*  
## factor(ProdID)4232 71.44836 28.01429 2.5504 0.0107819 \*   
## factor(ProdID)4233 112.43784 25.42969 4.4215 9.961e-06 \*\*\*  
## factor(ProdID)4235 42.37506 26.30975 1.6106 0.1073108   
## factor(ProdID)4236 102.68405 38.50486 2.6668 0.0076771 \*\*   
## factor(ProdID)4237 35.59121 28.01429 1.2705 0.2039640   
## factor(ProdID)4238 34.31746 25.87783 1.3261 0.1848421   
## factor(ProdID)4239 72.94836 28.01429 2.6040 0.0092361 \*\*   
## factor(ProdID)4240 54.14080 29.53346 1.8332 0.0668183 .   
## factor(ProdID)4241 50.79415 27.46432 1.8495 0.0644368 .   
## factor(ProdID)4242 0.66901 26.80426 0.0250 0.9800882   
## factor(ProdID)4243 76.66901 26.80426 2.8603 0.0042455 \*\*   
## factor(ProdID)4244 140.86686 30.46081 4.6245 3.827e-06 \*\*\*  
## factor(ProdID)4245 158.56234 26.81157 5.9140 3.510e-09 \*\*\*  
## factor(ProdID)4246 42.20624 26.29635 1.6050 0.1085374   
## factor(ProdID)4247 17.12526 26.29636 0.6512 0.5149142   
## factor(ProdID)4248 50.39080 29.53346 1.7062 0.0880136 .   
## factor(ProdID)4249 24.43443 26.81862 0.9111 0.3622769   
## factor(ProdID)4250 47.37193 26.81862 1.7664 0.0773788 .   
## factor(ProdID)4251 246.29838 28.29899 8.7034 < 2.2e-16 \*\*\*  
## factor(ProdID)4263 21.09121 28.01429 0.7529 0.4515532   
## factor(Wk)2 -26.86719 9.67116 -2.7781 0.0054839 \*\*   
## factor(Wk)3 38.54070 9.54871 4.0362 5.494e-05 \*\*\*  
## factor(Wk)4 52.68161 9.33728 5.6421 1.751e-08 \*\*\*  
## factor(Wk)5 8.98964 9.19116 0.9781 0.3280736   
## factor(Wk)6 35.84977 9.01497 3.9767 7.064e-05 \*\*\*  
## factor(Wk)7 77.68671 8.97424 8.6566 < 2.2e-16 \*\*\*  
## factor(Wk)8 19.59086 8.91940 2.1964 0.0280962 \*   
## factor(Wk)9 -21.95721 8.83122 -2.4863 0.0129323 \*   
## factor(Wk)10 109.78457 8.79555 12.4818 < 2.2e-16 \*\*\*  
## factor(Wk)11 56.84263 8.80317 6.4571 1.145e-10 \*\*\*  
## factor(Wk)12 -5.64004 8.76576 -0.6434 0.5199765   
## factor(Wk)13 -23.40626 8.73153 -2.6807 0.0073663 \*\*   
## factor(Wk)14 49.30263 8.73950 5.6414 1.758e-08 \*\*\*  
## factor(Wk)15 26.28745 8.70663 3.0192 0.0025439 \*\*   
## factor(Wk)16 -11.30461 8.70284 -1.2990 0.1940045   
## factor(Wk)17 -34.36906 8.69058 -3.9547 7.743e-05 \*\*\*  
## factor(Wk)18 40.79593 8.68467 4.6975 2.688e-06 \*\*\*  
## factor(Wk)19 24.66532 8.76322 2.8146 0.0048979 \*\*   
## factor(Wk)20 10.53124 8.80461 1.1961 0.2316989   
## factor(Wk)21 -36.23716 8.83286 -4.1025 4.136e-05 \*\*\*  
## factor(Wk)22 -46.55666 8.91815 -5.2204 1.840e-07 \*\*\*  
## factor(Wk)23 17.46758 8.92165 1.9579 0.0502862 .   
## factor(Wk)24 -15.48644 8.92115 -1.7359 0.0826247 .   
## factor(Wk)25 -26.38142 8.92015 -2.9575 0.0031125 \*\*   
## factor(Wk)26 -54.99058 9.03954 -6.0833 1.244e-09 \*\*\*  
## factor(Wk)27 -54.92968 9.14785 -6.0047 2.021e-09 \*\*\*  
## factor(Wk)28 -86.77755 9.14935 -9.4846 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 106630000  
## Residual Sum of Squares: 47468000  
## R-Squared: 0.55483  
## Adj. R-Squared: 0.53229  
## F-statistic: 24.6162 on 329 and 6498 DF, p-value: < 2.22e-16

model5 <- plm(Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk + HomePgWk + CatPgWk + I(VidWk\*CatalogWk) +  
 factor(ProdID) + factor(Wk), index=c("ProdID", "Wk"), data = fp\_sales, model = 'pooling')  
summary(model5)

## Pooling Model  
##   
## Call:  
## plm(formula = Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk +   
## HomePgWk + CatPgWk + I(VidWk \* CatalogWk) + factor(ProdID) +   
## factor(Wk), data = fp\_sales, model = "pooling", index = c("ProdID",   
## "Wk"))  
##   
## Unbalanced Panel: n = 297, T = 2-28, N = 6828  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -648.8388 -38.0161 -4.2477 28.2271 1890.2894   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 23.294171 17.528899 1.3289 0.1839273   
## VidWk 17.798271 5.096267 3.4924 0.0004819 \*\*\*  
## PriceDiscWk 76.655837 5.821210 13.1684 < 2.2e-16 \*\*\*  
## EmailWk 66.815098 22.046754 3.0306 0.0024502 \*\*   
## CatalogWk 121.078792 17.988485 6.7309 1.830e-11 \*\*\*  
## HomePgWk 61.013812 9.412893 6.4819 9.720e-11 \*\*\*  
## CatPgWk 28.958646 10.146254 2.8541 0.0043293 \*\*   
## I(VidWk \* CatalogWk) -161.657857 54.929308 -2.9430 0.0032618 \*\*   
## factor(ProdID)2143 167.605983 22.837776 7.3390 2.415e-13 \*\*\*  
## factor(ProdID)2413 43.820268 22.837776 1.9188 0.0550582 .   
## factor(ProdID)2461 17.882043 22.833140 0.7832 0.4335607   
## factor(ProdID)2532 53.672681 25.821824 2.0786 0.0376953 \*   
## factor(ProdID)2637 22.641697 22.837776 0.9914 0.3215203   
## factor(ProdID)2663 62.355983 22.837776 2.7304 0.0063430 \*\*   
## factor(ProdID)2700 29.463125 22.837776 1.2901 0.1970602   
## factor(ProdID)2716 73.641697 22.837776 3.2246 0.0012679 \*\*   
## factor(ProdID)2800 112.641697 22.837776 4.9323 8.331e-07 \*\*\*  
## factor(ProdID)3133 18.181769 25.403593 0.7157 0.4741922   
## factor(ProdID)3164 94.855983 22.837776 4.1535 3.317e-05 \*\*\*  
## factor(ProdID)3251 52.452459 24.045942 2.1813 0.0291937 \*   
## factor(ProdID)3253 93.273423 22.830205 4.0855 4.451e-05 \*\*\*  
## factor(ProdID)3261 272.734538 25.025130 10.8984 < 2.2e-16 \*\*\*  
## factor(ProdID)3269 91.500813 25.031545 3.6554 0.0002588 \*\*\*  
## factor(ProdID)3292 3.070268 22.837776 0.1344 0.8930603   
## factor(ProdID)3311 96.784554 22.837776 4.2379 2.287e-05 \*\*\*  
## factor(ProdID)3329 43.463125 22.837776 1.9031 0.0570685 .   
## factor(ProdID)3339 95.320268 22.837776 4.1738 3.035e-05 \*\*\*  
## factor(ProdID)3364 62.177411 22.837776 2.7226 0.0064949 \*\*   
## factor(ProdID)3381 54.271688 23.222266 2.3371 0.0194666 \*   
## factor(ProdID)3383 74.417099 23.049847 3.2285 0.0012505 \*\*   
## factor(ProdID)3408 38.712139 22.848590 1.6943 0.0902581 .   
## factor(ProdID)3409 60.392187 22.850567 2.6429 0.0082392 \*\*   
## factor(ProdID)3413 -9.865899 62.698392 -0.1574 0.8749701   
## factor(ProdID)3416 190.605983 22.837776 8.3461 < 2.2e-16 \*\*\*  
## factor(ProdID)3418 166.927411 22.837776 7.3093 3.008e-13 \*\*\*  
## factor(ProdID)3435 32.998840 22.837776 1.4449 0.1485276   
## factor(ProdID)3479 35.010475 24.409969 1.4343 0.1515435   
## factor(ProdID)3511 52.856650 22.831733 2.3151 0.0206411 \*   
## factor(ProdID)3561 29.500000 22.829258 1.2922 0.1963334   
## factor(ProdID)3618 4.141697 22.837776 0.1814 0.8560962   
## factor(ProdID)3619 -3.891737 26.789153 -0.1453 0.8845000   
## factor(ProdID)3642 37.339348 25.821824 1.4460 0.1482147   
## factor(ProdID)3643 105.141697 22.837776 4.6038 4.226e-06 \*\*\*  
## factor(ProdID)3659 -5.501160 22.837776 -0.2409 0.8096558   
## factor(ProdID)3671 190.248840 22.837776 8.3304 < 2.2e-16 \*\*\*  
## factor(ProdID)3677 69.231914 23.049847 3.0036 0.0026785 \*\*   
## factor(ProdID)3678 -16.322589 22.837776 -0.7147 0.4748085   
## factor(ProdID)3680 68.009691 24.773318 2.7453 0.0060626 \*\*   
## factor(ProdID)3696 -12.335146 23.404302 -0.5270 0.5981796   
## factor(ProdID)3701 123.998840 22.837776 5.4295 5.854e-08 \*\*\*  
## factor(ProdID)3723 -28.447353 22.988685 -1.2375 0.2159647   
## factor(ProdID)3727 -8.087017 27.984255 -0.2890 0.7726024   
## factor(ProdID)3728 -6.391737 26.789153 -0.2386 0.8114278   
## factor(ProdID)3729 32.963125 22.837776 1.4434 0.1489674   
## factor(ProdID)3730 -6.938430 25.821824 -0.2687 0.7881659   
## factor(ProdID)3741 46.427411 22.837776 2.0329 0.0421010 \*   
## factor(ProdID)3743 22.641697 22.837776 0.9914 0.3215203   
## factor(ProdID)3745 116.248840 22.837776 5.0902 3.677e-07 \*\*\*  
## factor(ProdID)3746 42.427411 22.837776 1.8578 0.0632464 .   
## factor(ProdID)3747 75.784554 22.837776 3.3184 0.0009104 \*\*\*  
## factor(ProdID)3749 -4.028758 25.403593 -0.1586 0.8739968   
## factor(ProdID)3751 32.927411 22.837776 1.4418 0.1494082   
## factor(ProdID)3753 20.034554 22.837776 0.8773 0.3803806   
## factor(ProdID)3757 -29.333994 24.697017 -1.1878 0.2349736   
## factor(ProdID)3759 -16.191137 24.697017 -0.6556 0.5121107   
## factor(ProdID)3765 -2.894017 22.837776 -0.1267 0.8991654   
## factor(ProdID)3770 -4.607143 22.829258 -0.2018 0.8400726   
## factor(ProdID)3771 7.850013 28.695173 0.2736 0.7844272   
## factor(ProdID)3778 11.927411 22.837776 0.5223 0.6015024   
## factor(ProdID)3785 19.465397 28.695173 0.6784 0.4975734   
## factor(ProdID)3788 -8.457680 28.695173 -0.2947 0.7682002   
## factor(ProdID)3808 -13.831242 27.353278 -0.5057 0.6131181   
## factor(ProdID)3809 4.284554 22.837776 0.1876 0.8511897   
## factor(ProdID)3810 16.534554 22.837776 0.7240 0.4690917   
## factor(ProdID)3811 51.892857 22.829258 2.2731 0.0230535 \*   
## factor(ProdID)3864 84.534554 22.837776 3.7015 0.0002161 \*\*\*  
## factor(ProdID)3880 126.998840 22.837776 5.5609 2.791e-08 \*\*\*  
## factor(ProdID)3887 406.827362 22.859112 17.7972 < 2.2e-16 \*\*\*  
## factor(ProdID)3888 135.108263 26.789153 5.0434 4.697e-07 \*\*\*  
## factor(ProdID)3889 -1.616192 24.755403 -0.0653 0.9479480   
## factor(ProdID)3890 -8.800851 30.437419 -0.2891 0.7724791   
## factor(ProdID)3891 65.534554 22.837776 2.8696 0.0041236 \*\*   
## factor(ProdID)3893 81.613805 22.927298 3.5597 0.0003740 \*\*\*  
## factor(ProdID)3894 16.197706 26.333906 0.6151 0.5385172   
## factor(ProdID)3895 24.642857 22.829258 1.0794 0.2804309   
## factor(ProdID)3897 17.936821 23.041060 0.7785 0.4363191   
## factor(ProdID)3898 117.641697 22.837776 5.1512 2.665e-07 \*\*\*  
## factor(ProdID)3902 26.500000 22.829258 1.1608 0.2457695   
## factor(ProdID)3904 84.596328 22.833140 3.7050 0.0002132 \*\*\*  
## factor(ProdID)3905 201.820268 22.837776 8.8371 < 2.2e-16 \*\*\*  
## factor(ProdID)3906 222.141697 22.837776 9.7269 < 2.2e-16 \*\*\*  
## factor(ProdID)3907 136.159299 24.684570 5.5160 3.602e-08 \*\*\*  
## factor(ProdID)3908 33.442746 25.447165 1.3142 0.1888242   
## factor(ProdID)3909 9.821429 22.829258 0.4302 0.6670555   
## factor(ProdID)3911 32.945532 23.512305 1.4012 0.1612009   
## factor(ProdID)3912 89.357143 22.829258 3.9142 9.165e-05 \*\*\*  
## factor(ProdID)3913 -1.965446 22.837776 -0.0861 0.9314204   
## factor(ProdID)3914 54.726880 24.055421 2.2750 0.0229364 \*   
## factor(ProdID)3915 70.927411 22.837776 3.1057 0.0019064 \*\*   
## factor(ProdID)3917 -26.809340 26.789970 -1.0007 0.3169980   
## factor(ProdID)3918 -7.989094 26.282078 -0.3040 0.7611567   
## factor(ProdID)3924 79.863805 22.927298 3.4834 0.0004984 \*\*\*  
## factor(ProdID)3925 69.785221 22.831733 3.0565 0.0022485 \*\*   
## factor(ProdID)3926 83.749507 22.831733 3.6681 0.0002463 \*\*\*  
## factor(ProdID)3927 36.035221 22.831733 1.5783 0.1145464   
## factor(ProdID)3928 23.074317 24.076761 0.9584 0.3379146   
## factor(ProdID)3929 13.141697 22.837776 0.5754 0.5650159   
## factor(ProdID)3930 -25.271157 25.207084 -1.0025 0.3161193   
## factor(ProdID)3931 3.384026 29.688093 0.1140 0.9092524   
## factor(ProdID)3932 65.963125 22.837776 2.8883 0.0038857 \*\*   
## factor(ProdID)3933 2.191363 24.752329 0.0885 0.9294569   
## factor(ProdID)3935 9.091178 25.146808 0.3615 0.7177194   
## factor(ProdID)3936 62.391697 22.837776 2.7320 0.0063131 \*\*   
## factor(ProdID)3937 11.642857 22.829258 0.5100 0.6100708   
## factor(ProdID)3938 242.799897 22.977007 10.5671 < 2.2e-16 \*\*\*  
## factor(ProdID)3939 89.117207 23.216375 3.8385 0.0001249 \*\*\*  
## factor(ProdID)3940 36.177902 22.850567 1.5832 0.1134157   
## factor(ProdID)3942 72.534554 22.837776 3.1761 0.0014998 \*\*   
## factor(ProdID)3943 258.534554 22.837776 11.3205 < 2.2e-16 \*\*\*  
## factor(ProdID)3945 94.720947 22.927298 4.1314 3.651e-05 \*\*\*  
## factor(ProdID)3946 72.007822 22.916881 3.1421 0.0016848 \*\*   
## factor(ProdID)3948 216.584172 22.958243 9.4338 < 2.2e-16 \*\*\*  
## factor(ProdID)3950 -11.243338 22.927298 -0.4904 0.6238739   
## factor(ProdID)3951 8.810410 24.752329 0.3559 0.7218950   
## factor(ProdID)3952 -6.707624 22.927298 -0.2926 0.7698674   
## factor(ProdID)3953 167.463125 22.837776 7.3327 2.529e-13 \*\*\*  
## factor(ProdID)3954 36.604996 22.848590 1.6021 0.1091892   
## factor(ProdID)3955 32.893174 22.840829 1.4401 0.1498861   
## factor(ProdID)3956 67.290896 22.953205 2.9317 0.0033834 \*\*   
## factor(ProdID)3959 53.874300 23.266973 2.3155 0.0206175 \*   
## factor(ProdID)3960 57.463125 22.837776 2.5161 0.0118886 \*   
## factor(ProdID)3962 103.393174 22.840829 4.5267 6.099e-06 \*\*\*  
## factor(ProdID)3964 160.641697 22.837776 7.0340 2.212e-12 \*\*\*  
## factor(ProdID)3965 53.505934 22.859112 2.3407 0.0192786 \*   
## factor(ProdID)3966 33.998840 22.837776 1.4887 0.1366121   
## factor(ProdID)3967 133.844851 22.830205 5.8626 4.780e-09 \*\*\*  
## factor(ProdID)3984 100.355983 22.837776 4.3943 1.129e-05 \*\*\*  
## factor(ProdID)3987 163.152190 25.042258 6.5151 7.810e-11 \*\*\*  
## factor(ProdID)3988 110.850813 25.031545 4.4284 9.647e-06 \*\*\*  
## factor(ProdID)3990 66.945083 24.048760 2.7837 0.0053894 \*\*   
## factor(ProdID)3992 74.792376 22.927298 3.2622 0.0011114 \*\*   
## factor(ProdID)3993 206.559411 23.088244 8.9465 < 2.2e-16 \*\*\*  
## factor(ProdID)3995 -16.158354 25.827065 -0.6256 0.5315754   
## factor(ProdID)3997 41.472424 22.930151 1.8086 0.0705529 .   
## factor(ProdID)3998 1.105983 22.837776 0.0484 0.9613768   
## factor(ProdID)4002 337.650464 25.576348 13.2017 < 2.2e-16 \*\*\*  
## factor(ProdID)4004 79.737443 23.391173 3.4089 0.0006563 \*\*\*  
## factor(ProdID)4005 96.534554 22.837776 4.2270 2.401e-05 \*\*\*  
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## factor(ProdID)4007 89.070268 22.837776 3.9001 9.711e-05 \*\*\*  
## factor(ProdID)4008 21.714286 22.829258 0.9512 0.3415584   
## factor(ProdID)4010 687.929779 22.969330 29.9499 < 2.2e-16 \*\*\*  
## factor(ProdID)4011 21.614965 22.916881 0.9432 0.3456190   
## factor(ProdID)4018 16.003672 23.049460 0.6943 0.4875071   
## factor(ProdID)4020 -0.170749 22.916881 -0.0075 0.9940554   
## factor(ProdID)4021 39.864472 22.920136 1.7393 0.0820334 .   
## factor(ProdID)4022 47.820268 22.837776 2.0939 0.0363066 \*   
## factor(ProdID)4023 124.498840 22.837776 5.4514 5.180e-08 \*\*\*  
## factor(ProdID)4025 10.578090 22.927298 0.4614 0.6445448   
## factor(ProdID)4026 53.391697 22.837776 2.3379 0.0194243 \*   
## factor(ProdID)4027 41.321429 22.829258 1.8100 0.0703388 .   
## factor(ProdID)4030 89.748840 22.837776 3.9298 8.588e-05 \*\*\*  
## factor(ProdID)4031 116.427411 22.837776 5.0980 3.529e-07 \*\*\*  
## factor(ProdID)4033 -16.204987 22.919558 -0.7070 0.4795685   
## factor(ProdID)4034 -7.049541 25.821824 -0.2730 0.7848564   
## factor(ProdID)4035 -18.049541 25.821824 -0.6990 0.4845750   
## factor(ProdID)4036 110.678571 22.829258 4.8481 1.275e-06 \*\*\*  
## factor(ProdID)4041 -15.942380 24.895916 -0.6404 0.5219603   
## factor(ProdID)4046 30.213750 25.050297 1.2061 0.2278138   
## factor(ProdID)4047 147.771768 24.755442 5.9693 2.509e-09 \*\*\*  
## factor(ProdID)4049 1.217707 25.115993 0.0485 0.9613325   
## factor(ProdID)4050 82.432055 24.172380 3.4102 0.0006532 \*\*\*  
## factor(ProdID)4051 -1.108771 24.481042 -0.0453 0.9638768   
## factor(ProdID)4052 -0.086319 27.353569 -0.0032 0.9974822   
## factor(ProdID)4053 130.006662 22.927298 5.6704 1.486e-08 \*\*\*  
## factor(ProdID)4055 -10.214286 22.829258 -0.4474 0.6545862   
## factor(ProdID)4056 215.605983 22.837776 9.4408 < 2.2e-16 \*\*\*  
## factor(ProdID)4057 94.150996 22.930151 4.1060 4.075e-05 \*\*\*  
## factor(ProdID)4058 -7.285714 22.829258 -0.3191 0.7496311   
## factor(ProdID)4059 161.748840 22.837776 7.0825 1.565e-12 \*\*\*  
## factor(ProdID)4060 63.399519 22.927298 2.7652 0.0057041 \*\*   
## factor(ProdID)4061 -18.759595 26.007940 -0.7213 0.4707493   
## factor(ProdID)4063 -40.713399 24.752329 -1.6448 0.1000530   
## factor(ProdID)4064 179.901288 23.937643 7.5154 6.437e-14 \*\*\*  
## factor(ProdID)4065 39.529414 23.041060 1.7156 0.0862816 .   
## factor(ProdID)4067 -1.689792 29.503171 -0.0573 0.9543280   
## factor(ProdID)4068 151.713125 22.837776 6.6431 3.321e-11 \*\*\*  
## factor(ProdID)4069 26.642857 22.829258 1.1670 0.2432335   
## factor(ProdID)4071 49.022578 23.517868 2.0845 0.0371553 \*   
## factor(ProdID)4072 46.297547 24.760757 1.8698 0.0615572 .   
## factor(ProdID)4073 97.872993 23.626075 4.1426 3.478e-05 \*\*\*  
## factor(ProdID)4074 42.500813 25.031545 1.6979 0.0895764 .   
## factor(ProdID)4075 9.964891 26.797899 0.3719 0.7100141   
## factor(ProdID)4076 152.104233 23.521930 6.4665 1.076e-10 \*\*\*  
## factor(ProdID)4077 33.430978 23.723946 1.4092 0.1588339   
## factor(ProdID)4078 229.564923 23.776968 9.6549 < 2.2e-16 \*\*\*  
## factor(ProdID)4079 18.385532 23.512305 0.7820 0.4342703   
## factor(ProdID)4080 155.226844 23.300613 6.6619 2.924e-11 \*\*\*  
## factor(ProdID)4082 90.093603 23.767971 3.7905 0.0001517 \*\*\*  
## factor(ProdID)4083 18.114293 23.614140 0.7671 0.4430528   
## factor(ProdID)4084 137.642281 23.276058 5.9135 3.520e-09 \*\*\*  
## factor(ProdID)4085 41.719204 23.276058 1.7924 0.0731209 .   
## factor(ProdID)4087 192.712441 23.629965 8.1554 4.141e-16 \*\*\*  
## factor(ProdID)4088 192.223128 23.533840 8.1679 3.737e-16 \*\*\*  
## factor(ProdID)4089 -14.698800 25.520068 -0.5760 0.5646552   
## factor(ProdID)4090 24.666297 23.508311 1.0493 0.2940981   
## factor(ProdID)4092 33.021119 23.880744 1.3828 0.1667888   
## factor(ProdID)4093 20.514595 27.984937 0.7331 0.4635492   
## factor(ProdID)4094 5.943166 27.984937 0.2124 0.8318249   
## factor(ProdID)4095 -45.317103 26.408175 -1.7160 0.0862050 .   
## factor(ProdID)4096 184.426728 24.355388 7.5723 4.176e-14 \*\*\*  
## factor(ProdID)4097 117.568454 23.537040 4.9950 6.036e-07 \*\*\*  
## factor(ProdID)4098 149.731014 23.780854 6.2963 3.248e-10 \*\*\*  
## factor(ProdID)4099 46.526896 23.276058 1.9989 0.0456590 \*   
## factor(ProdID)4100 20.859113 24.060462 0.8669 0.3860038   
## factor(ProdID)4101 -4.702623 23.266973 -0.2021 0.8398325   
## factor(ProdID)4103 65.380852 24.060462 2.7174 0.0065980 \*\*   
## factor(ProdID)4104 -11.576059 24.079281 -0.4807 0.6307120   
## factor(ProdID)4105 45.641336 24.045198 1.8981 0.0577209 .   
## factor(ProdID)4106 74.315701 31.503643 2.3590 0.0183559 \*   
## factor(ProdID)4107 142.939923 23.776968 6.0117 1.935e-09 \*\*\*  
## factor(ProdID)4108 -67.313227 27.118392 -2.4822 0.0130825 \*   
## factor(ProdID)4109 -64.598337 26.580285 -2.4303 0.0151128 \*   
## factor(ProdID)4111 112.783202 24.409969 4.6204 3.904e-06 \*\*\*  
## factor(ProdID)4112 37.996859 23.375001 1.6255 0.1040973   
## factor(ProdID)4113 -38.407949 25.939742 -1.4807 0.1387456   
## factor(ProdID)4114 80.649446 24.172380 3.3364 0.0008534 \*\*\*  
## factor(ProdID)4116 25.744910 24.355388 1.0571 0.2905272   
## factor(ProdID)4117 3.106217 23.796443 0.1305 0.8961489   
## factor(ProdID)4118 240.776275 23.561463 10.2191 < 2.2e-16 \*\*\*  
## factor(ProdID)4119 148.180740 23.304955 6.3583 2.178e-10 \*\*\*  
## factor(ProdID)4120 232.683766 24.679683 9.4282 < 2.2e-16 \*\*\*  
## factor(ProdID)4121 41.989547 24.060462 1.7452 0.0810029 .   
## factor(ProdID)4122 1.240600 24.132854 0.0514 0.9590027   
## factor(ProdID)4123 90.019089 24.051700 3.7427 0.0001836 \*\*\*  
## factor(ProdID)4124 20.183325 23.511497 0.8584 0.3906785   
## factor(ProdID)4125 153.324261 23.827095 6.4349 1.324e-10 \*\*\*  
## factor(ProdID)4127 95.892774 24.132854 3.9735 7.158e-05 \*\*\*  
## factor(ProdID)4128 200.400452 23.893398 8.3873 < 2.2e-16 \*\*\*  
## factor(ProdID)4129 24.024610 23.767185 1.0108 0.3121349   
## factor(ProdID)4131 21.119982 24.060462 0.8778 0.3800913   
## factor(ProdID)4133 83.215764 24.774411 3.3589 0.0007869 \*\*\*  
## factor(ProdID)4135 -17.289092 26.937295 -0.6418 0.5210079   
## factor(ProdID)4141 24.292097 24.055421 1.0098 0.3126101   
## factor(ProdID)4145 44.001522 25.170887 1.7481 0.0804919 .   
## factor(ProdID)4152 15.097496 24.669129 0.6120 0.5405595   
## factor(ProdID)4157 33.382578 23.517868 1.4195 0.1558141   
## factor(ProdID)4158 30.034198 25.935149 1.1580 0.2468862   
## factor(ProdID)4179 152.780221 24.297359 6.2879 3.426e-10 \*\*\*  
## factor(ProdID)4180 47.250813 25.031545 1.8877 0.0591174 .   
## factor(ProdID)4181 8.716543 24.669129 0.3533 0.7238464   
## factor(ProdID)4182 -31.486319 27.353569 -1.1511 0.2497391   
## factor(ProdID)4189 184.877585 23.839970 7.7549 1.020e-14 \*\*\*  
## factor(ProdID)4190 106.316839 23.827289 4.4620 8.258e-06 \*\*\*  
## factor(ProdID)4191 9.256741 24.668523 0.3752 0.7074905   
## factor(ProdID)4193 353.352190 25.042258 14.1102 < 2.2e-16 \*\*\*  
## factor(ProdID)4194 14.674983 24.769162 0.5925 0.5535566   
## factor(ProdID)4195 197.200813 25.031545 7.8781 3.870e-15 \*\*\*  
## factor(ProdID)4202 32.100813 25.031545 1.2824 0.1997431   
## factor(ProdID)4203 26.850813 25.031545 1.0727 0.2834550   
## factor(ProdID)4204 10.391171 26.838700 0.3872 0.6986422   
## factor(ProdID)4205 74.798982 27.997786 2.6716 0.0075678 \*\*   
## factor(ProdID)4206 105.676892 25.833854 4.0906 4.354e-05 \*\*\*  
## factor(ProdID)4207 52.798982 27.997786 1.8858 0.0593628 .   
## factor(ProdID)4208 148.350057 26.320468 5.6363 1.810e-08 \*\*\*  
## factor(ProdID)4209 169.955432 25.862606 6.5715 5.369e-11 \*\*\*  
## factor(ProdID)4210 196.531470 27.119947 7.2467 4.763e-13 \*\*\*  
## factor(ProdID)4211 3.587017 27.984255 0.1282 0.8980106   
## factor(ProdID)4212 105.436275 29.516072 3.5722 0.0003566 \*\*\*  
## factor(ProdID)4213 51.405414 28.919222 1.7776 0.0755243 .   
## factor(ProdID)4214 65.120569 25.840306 2.5201 0.0117554 \*   
## factor(ProdID)4215 46.077813 26.802828 1.7191 0.0856365 .   
## factor(ProdID)4216 41.589409 26.302514 1.5812 0.1138821   
## factor(ProdID)4217 18.175212 26.294261 0.6912 0.4894498   
## factor(ProdID)4218 339.954054 25.414720 13.3763 < 2.2e-16 \*\*\*  
## factor(ProdID)4219 56.217212 25.414720 2.2120 0.0270017 \*   
## factor(ProdID)4220 142.743528 25.414720 5.6166 2.028e-08 \*\*\*  
## factor(ProdID)4225 57.396812 25.884919 2.2174 0.0266313 \*   
## factor(ProdID)4226 64.141171 26.838700 2.3899 0.0168824 \*   
## factor(ProdID)4227 124.463913 27.377208 4.5463 5.560e-06 \*\*\*  
## factor(ProdID)4228 119.057970 25.851575 4.6054 4.194e-06 \*\*\*  
## factor(ProdID)4229 11.970640 26.382659 0.4537 0.6500373   
## factor(ProdID)4230 43.080398 26.812076 1.6068 0.1081570   
## factor(ProdID)4231 95.892729 26.946830 3.5586 0.0003755 \*\*\*  
## factor(ProdID)4232 71.441839 27.997786 2.5517 0.0107427 \*   
## factor(ProdID)4233 112.480370 25.414720 4.4258 9.766e-06 \*\*\*  
## factor(ProdID)4235 42.410506 26.294261 1.6129 0.1068107   
## factor(ProdID)4236 102.837417 38.482221 2.6723 0.0075513 \*\*   
## factor(ProdID)4237 35.584696 27.997786 1.2710 0.2037804   
## factor(ProdID)4238 34.399877 25.862606 1.3301 0.1835317   
## factor(ProdID)4239 72.941839 27.997786 2.6053 0.0092011 \*\*   
## factor(ProdID)4240 54.102942 29.516072 1.8330 0.0668484 .   
## factor(ProdID)4241 48.496539 27.459243 1.7661 0.0774213 .   
## factor(ProdID)4242 0.683334 26.788476 0.0255 0.9796502   
## factor(ProdID)4243 76.683334 26.788476 2.8625 0.0042159 \*\*   
## factor(ProdID)4244 140.820184 30.442870 4.6257 3.805e-06 \*\*\*  
## factor(ProdID)4245 158.578981 26.795782 5.9181 3.424e-09 \*\*\*  
## factor(ProdID)4246 42.235946 26.280865 1.6071 0.1080813   
## factor(ProdID)4247 17.156878 26.280870 0.6528 0.5138905   
## factor(ProdID)4248 50.352942 29.516072 1.7059 0.0880652 .   
## factor(ProdID)4249 24.452813 26.802828 0.9123 0.3616330   
## factor(ProdID)4250 47.390313 26.802828 1.7681 0.0770897 .   
## factor(ProdID)4251 246.612673 28.282521 8.7196 < 2.2e-16 \*\*\*  
## factor(ProdID)4263 21.084696 27.997786 0.7531 0.4514265   
## factor(Wk)2 -26.856544 9.665461 -2.7786 0.0054749 \*\*   
## factor(Wk)3 38.570980 9.543094 4.0418 5.366e-05 \*\*\*  
## factor(Wk)4 52.699519 9.331780 5.6473 1.699e-08 \*\*\*  
## factor(Wk)5 8.865917 9.185841 0.9652 0.3344946   
## factor(Wk)6 36.375618 9.011436 4.0366 5.485e-05 \*\*\*  
## factor(Wk)7 77.676886 8.968951 8.6606 < 2.2e-16 \*\*\*  
## factor(Wk)8 19.363002 8.914481 2.1721 0.0298854 \*   
## factor(Wk)9 -22.183398 8.826357 -2.5133 0.0119843 \*   
## factor(Wk)10 109.762854 8.790375 12.4867 < 2.2e-16 \*\*\*  
## factor(Wk)11 56.500375 8.798758 6.4214 1.446e-10 \*\*\*  
## factor(Wk)12 -6.027758 8.761591 -0.6880 0.4914930   
## factor(Wk)13 -23.621836 8.726696 -2.7068 0.0068103 \*\*   
## factor(Wk)14 48.974226 8.735067 5.6066 2.148e-08 \*\*\*  
## factor(Wk)15 25.956229 8.702232 2.9827 0.0028677 \*\*   
## factor(Wk)16 -11.495015 8.697950 -1.3216 0.1863554   
## factor(Wk)17 -34.507447 8.685590 -3.9730 7.175e-05 \*\*\*  
## factor(Wk)18 40.543051 8.679984 4.6709 3.060e-06 \*\*\*  
## factor(Wk)19 24.360491 8.758674 2.7813 0.0054298 \*\*   
## factor(Wk)20 10.353165 8.799628 1.1765 0.2394199   
## factor(Wk)21 -36.409052 8.827852 -4.1243 3.764e-05 \*\*\*  
## factor(Wk)22 -46.626967 8.912930 -5.2314 1.735e-07 \*\*\*  
## factor(Wk)23 17.401903 8.916428 1.9517 0.0510206 .   
## factor(Wk)24 -15.043969 8.917163 -1.6871 0.0916359 .   
## factor(Wk)25 -25.938390 8.916169 -2.9091 0.0036365 \*\*   
## factor(Wk)26 -55.069808 9.034253 -6.0957 1.152e-09 \*\*\*  
## factor(Wk)27 -55.018934 9.142510 -6.0179 1.863e-09 \*\*\*  
## factor(Wk)28 -86.809389 9.143972 -9.4936 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 106630000  
## Residual Sum of Squares: 47405000  
## R-Squared: 0.55542  
## Adj. R-Squared: 0.53284  
## F-statistic: 24.5968 on 330 and 6497 DF, p-value: < 2.22e-16

model6 <- plm(Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk + HomePgWk + CatPgWk + I(VidWk\*HomePgWk) +  
 factor(ProdID) + factor(Wk), index=c("ProdID", "Wk"), data = fp\_sales, model = 'pooling')  
summary(model6)

## Pooling Model  
##   
## Call:  
## plm(formula = Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk +   
## HomePgWk + CatPgWk + I(VidWk \* HomePgWk) + factor(ProdID) +   
## factor(Wk), data = fp\_sales, model = "pooling", index = c("ProdID",   
## "Wk"))  
##   
## Unbalanced Panel: n = 297, T = 2-28, N = 6828  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -649.4334 -38.1328 -4.1979 28.2832 1900.7949   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 23.35475 17.53236 1.3321 0.1828761   
## VidWk 15.63423 5.10207 3.0643 0.0021908 \*\*   
## PriceDiscWk 77.13490 5.82598 13.2398 < 2.2e-16 \*\*\*  
## EmailWk 72.56006 22.08856 3.2850 0.0010254 \*\*   
## CatalogWk 103.89338 17.00677 6.1089 1.061e-09 \*\*\*  
## HomePgWk 53.87214 9.85402 5.4670 4.747e-08 \*\*\*  
## CatPgWk 28.72242 10.15101 2.8295 0.0046762 \*\*   
## I(VidWk \* HomePgWk) 78.66654 31.73963 2.4785 0.0132190 \*   
## factor(ProdID)2143 167.65731 22.84221 7.3398 2.400e-13 \*\*\*  
## factor(ProdID)2413 43.87160 22.84221 1.9206 0.0548212 .   
## factor(ProdID)2461 17.90759 22.83757 0.7841 0.4329933   
## factor(ProdID)2532 53.65484 25.82682 2.0775 0.0377960 \*   
## factor(ProdID)2637 22.69302 22.84221 0.9935 0.3205185   
## factor(ProdID)2663 62.40731 22.84221 2.7321 0.0063101 \*\*   
## factor(ProdID)2700 29.51445 22.84221 1.2921 0.1963679   
## factor(ProdID)2716 73.69303 22.84221 3.2262 0.0012608 \*\*   
## factor(ProdID)2800 112.69303 22.84221 4.9335 8.276e-07 \*\*\*  
## factor(ProdID)3133 18.15330 25.40851 0.7145 0.4749698   
## factor(ProdID)3164 94.90731 22.84221 4.1549 3.296e-05 \*\*\*  
## factor(ProdID)3251 52.47960 24.05060 2.1820 0.0291416 \*   
## factor(ProdID)3253 93.29053 22.83463 4.0855 4.451e-05 \*\*\*  
## factor(ProdID)3261 273.10557 25.03054 10.9109 < 2.2e-16 \*\*\*  
## factor(ProdID)3269 91.56267 25.03643 3.6572 0.0002570 \*\*\*  
## factor(ProdID)3292 3.12160 22.84221 0.1367 0.8913045   
## factor(ProdID)3311 96.83588 22.84221 4.2393 2.273e-05 \*\*\*  
## factor(ProdID)3329 43.51445 22.84221 1.9050 0.0568239 .   
## factor(ProdID)3339 95.37160 22.84221 4.1752 3.016e-05 \*\*\*  
## factor(ProdID)3364 62.22874 22.84221 2.7243 0.0064613 \*\*   
## factor(ProdID)3381 56.10062 23.22784 2.4152 0.0157526 \*   
## factor(ProdID)3383 74.47257 23.05432 3.2303 0.0012427 \*\*   
## factor(ProdID)3408 39.27359 22.85417 1.7184 0.0857635 .   
## factor(ProdID)3409 60.96207 22.85625 2.6672 0.0076677 \*\*   
## factor(ProdID)3413 -9.89806 62.71054 -0.1578 0.8745899   
## factor(ProdID)3416 190.65731 22.84221 8.3467 < 2.2e-16 \*\*\*  
## factor(ProdID)3418 166.97874 22.84221 7.3101 2.990e-13 \*\*\*  
## factor(ProdID)3435 33.05017 22.84221 1.4469 0.1479759   
## factor(ProdID)3479 36.62067 24.40923 1.5003 0.1335906   
## factor(ProdID)3511 53.11171 22.83639 2.3257 0.0200626 \*   
## factor(ProdID)3561 29.50000 22.83368 1.2920 0.1964200   
## factor(ProdID)3618 4.19302 22.84221 0.1836 0.8543606   
## factor(ProdID)3619 -3.90035 26.79434 -0.1456 0.8842685   
## factor(ProdID)3642 37.32151 25.82682 1.4451 0.1484871   
## factor(ProdID)3643 105.19303 22.84221 4.6052 4.199e-06 \*\*\*  
## factor(ProdID)3659 -5.44983 22.84221 -0.2386 0.8114341   
## factor(ProdID)3671 190.30017 22.84221 8.3311 < 2.2e-16 \*\*\*  
## factor(ProdID)3677 69.28739 23.05432 3.0054 0.0026625 \*\*   
## factor(ProdID)3678 -16.27126 22.84221 -0.7123 0.4762841   
## factor(ProdID)3680 67.49571 24.77852 2.7240 0.0064677 \*\*   
## factor(ProdID)3696 -10.11978 23.41032 -0.4323 0.6655533   
## factor(ProdID)3701 124.05017 22.84221 5.4307 5.815e-08 \*\*\*  
## factor(ProdID)3723 -28.66977 22.99333 -1.2469 0.2124889   
## factor(ProdID)3727 -8.07303 27.98967 -0.2884 0.7730277   
## factor(ProdID)3728 -6.40034 26.79434 -0.2389 0.8112145   
## factor(ProdID)3729 33.01445 22.84221 1.4453 0.1484144   
## factor(ProdID)3730 -6.95627 25.82682 -0.2693 0.7876743   
## factor(ProdID)3741 46.47874 22.84221 2.0348 0.0419141 \*   
## factor(ProdID)3743 22.69302 22.84221 0.9935 0.3205185   
## factor(ProdID)3745 116.30017 22.84221 5.0915 3.653e-07 \*\*\*  
## factor(ProdID)3746 42.47874 22.84221 1.8597 0.0629788 .   
## factor(ProdID)3747 75.83588 22.84221 3.3200 0.0009052 \*\*\*  
## factor(ProdID)3749 -4.05722 25.40851 -0.1597 0.8731384   
## factor(ProdID)3751 32.97874 22.84221 1.4438 0.1488538   
## factor(ProdID)3753 20.08588 22.84221 0.8793 0.3792539   
## factor(ProdID)3757 -29.50597 24.70184 -1.1945 0.2323321   
## factor(ProdID)3759 -16.36311 24.70184 -0.6624 0.5077226   
## factor(ProdID)3765 -2.84269 22.84221 -0.1244 0.9009636   
## factor(ProdID)3770 -4.60714 22.83368 -0.2018 0.8401031   
## factor(ProdID)3771 7.87635 28.70073 0.2744 0.7837627   
## factor(ProdID)3778 11.97874 22.84221 0.5244 0.6000096   
## factor(ProdID)3785 19.49173 28.70073 0.6791 0.4970751   
## factor(ProdID)3788 -8.43134 28.70073 -0.2938 0.7689449   
## factor(ProdID)3808 -13.82737 27.35857 -0.5054 0.6132861   
## factor(ProdID)3809 4.33588 22.84221 0.1898 0.8494570   
## factor(ProdID)3810 16.58588 22.84221 0.7261 0.4677995   
## factor(ProdID)3811 51.89286 22.83368 2.2726 0.0230801 \*   
## factor(ProdID)3864 84.58588 22.84221 3.7031 0.0002148 \*\*\*  
## factor(ProdID)3880 127.05017 22.84221 5.5621 2.772e-08 \*\*\*  
## factor(ProdID)3887 407.19207 22.86428 17.8091 < 2.2e-16 \*\*\*  
## factor(ProdID)3888 135.09966 26.79434 5.0421 4.729e-07 \*\*\*  
## factor(ProdID)3889 -1.84536 24.76027 -0.0745 0.9405918   
## factor(ProdID)3890 -8.55091 30.44330 -0.2809 0.7788116   
## factor(ProdID)3891 65.58588 22.84221 2.8713 0.0041016 \*\*   
## factor(ProdID)3893 82.51529 22.93208 3.5982 0.0003228 \*\*\*  
## factor(ProdID)3894 17.44267 26.34428 0.6621 0.5079276   
## factor(ProdID)3895 24.64286 22.83368 1.0792 0.2805240   
## factor(ProdID)3897 17.93906 23.04552 0.7784 0.4363506   
## factor(ProdID)3898 117.69303 22.84221 5.1524 2.647e-07 \*\*\*  
## factor(ProdID)3902 26.50000 22.83368 1.1606 0.2458609   
## factor(ProdID)3904 84.62187 22.83757 3.7054 0.0002128 \*\*\*  
## factor(ProdID)3905 201.87160 22.84221 8.8377 < 2.2e-16 \*\*\*  
## factor(ProdID)3906 222.19303 22.84221 9.7273 < 2.2e-16 \*\*\*  
## factor(ProdID)3907 136.54910 24.69000 5.5305 3.317e-08 \*\*\*  
## factor(ProdID)3908 34.54191 25.45641 1.3569 0.1748587   
## factor(ProdID)3909 9.82143 22.83368 0.4301 0.6671160   
## factor(ProdID)3911 32.95388 23.51686 1.4013 0.1611759   
## factor(ProdID)3912 89.35714 22.83368 3.9134 9.194e-05 \*\*\*  
## factor(ProdID)3913 -1.91412 22.84221 -0.0838 0.9332201   
## factor(ProdID)3914 54.79568 24.06010 2.2774 0.0227917 \*   
## factor(ProdID)3915 70.97874 22.84221 3.1074 0.0018959 \*\*   
## factor(ProdID)3917 -26.84487 26.79515 -1.0019 0.3164507   
## factor(ProdID)3918 -8.01712 26.28716 -0.3050 0.7603893   
## factor(ProdID)3924 80.76529 22.93208 3.5219 0.0004314 \*\*\*  
## factor(ProdID)3925 70.04028 22.83639 3.0670 0.0021707 \*\*   
## factor(ProdID)3926 84.00457 22.83639 3.6785 0.0002365 \*\*\*  
## factor(ProdID)3927 36.29028 22.83639 1.5891 0.1120769   
## factor(ProdID)3928 24.01215 24.08454 0.9970 0.3188045   
## factor(ProdID)3929 13.19303 22.84221 0.5776 0.5635730   
## factor(ProdID)3930 -24.41288 25.21179 -0.9683 0.3329246   
## factor(ProdID)3931 2.99445 29.69397 0.1008 0.9196776   
## factor(ProdID)3932 66.01445 22.84221 2.8900 0.0038649 \*\*   
## factor(ProdID)3933 1.95095 24.75725 0.0788 0.9371916   
## factor(ProdID)3935 10.14108 25.15214 0.4032 0.6868220   
## factor(ProdID)3936 62.44302 22.84221 2.7337 0.0062803 \*\*   
## factor(ProdID)3937 11.64286 22.83368 0.5099 0.6101399   
## factor(ProdID)3938 243.41189 22.97945 10.5926 < 2.2e-16 \*\*\*  
## factor(ProdID)3939 88.35746 23.22847 3.8038 0.0001438 \*\*\*  
## factor(ProdID)3940 36.74779 22.85625 1.6078 0.1079323   
## factor(ProdID)3942 72.58588 22.84221 3.1777 0.0014914 \*\*   
## factor(ProdID)3943 258.58588 22.84221 11.3205 < 2.2e-16 \*\*\*  
## factor(ProdID)3945 95.62243 22.93208 4.1698 3.088e-05 \*\*\*  
## factor(ProdID)3946 72.85798 22.92148 3.1786 0.0014869 \*\*   
## factor(ProdID)3948 218.41038 22.95922 9.5130 < 2.2e-16 \*\*\*  
## factor(ProdID)3950 -10.34185 22.93208 -0.4510 0.6520209   
## factor(ProdID)3951 8.57000 24.75725 0.3462 0.7292328   
## factor(ProdID)3952 -5.80614 22.93208 -0.2532 0.8001306   
## factor(ProdID)3953 167.51445 22.84221 7.3335 2.514e-13 \*\*\*  
## factor(ProdID)3954 37.16644 22.85417 1.6262 0.1039464   
## factor(ProdID)3955 32.95294 22.84527 1.4424 0.1492265   
## factor(ProdID)3956 60.52900 23.13927 2.6159 0.0089210 \*\*   
## factor(ProdID)3959 53.87677 23.27148 2.3151 0.0206362 \*   
## factor(ProdID)3960 57.51445 22.84221 2.5179 0.0118294 \*   
## factor(ProdID)3962 103.45294 22.84527 4.5284 6.049e-06 \*\*\*  
## factor(ProdID)3964 160.69303 22.84221 7.0349 2.198e-12 \*\*\*  
## factor(ProdID)3965 53.87064 22.86428 2.3561 0.0184973 \*   
## factor(ProdID)3966 34.05017 22.84221 1.4907 0.1360970   
## factor(ProdID)3967 133.86196 22.83463 5.8622 4.791e-09 \*\*\*  
## factor(ProdID)3984 100.40731 22.84221 4.3957 1.122e-05 \*\*\*  
## factor(ProdID)3987 163.58294 25.04793 6.5308 7.037e-11 \*\*\*  
## factor(ProdID)3988 110.91267 25.03643 4.4301 9.576e-06 \*\*\*  
## factor(ProdID)3990 67.26190 24.05379 2.7963 0.0051841 \*\*   
## factor(ProdID)3992 75.69386 22.93208 3.3008 0.0009694 \*\*\*  
## factor(ProdID)3993 207.88788 23.08867 9.0039 < 2.2e-16 \*\*\*  
## factor(ProdID)3995 -16.16307 25.83207 -0.6257 0.5315350   
## factor(ProdID)3997 42.38235 22.93506 1.8479 0.0646582 .   
## factor(ProdID)3998 1.15731 22.84221 0.0507 0.9595937   
## factor(ProdID)4002 328.96474 25.84940 12.7262 < 2.2e-16 \*\*\*  
## factor(ProdID)4004 81.90148 23.39675 3.5005 0.0004674 \*\*\*  
## factor(ProdID)4005 96.58588 22.84221 4.2284 2.386e-05 \*\*\*  
## factor(ProdID)4006 111.80017 22.84221 4.8945 1.010e-06 \*\*\*  
## factor(ProdID)4007 89.12160 22.84221 3.9016 9.652e-05 \*\*\*  
## factor(ProdID)4008 21.71429 22.83368 0.9510 0.3416518   
## factor(ProdID)4010 690.51759 22.96992 30.0618 < 2.2e-16 \*\*\*  
## factor(ProdID)4011 22.46512 22.92148 0.9801 0.3270781   
## factor(ProdID)4018 12.41606 23.00965 0.5396 0.5894897   
## factor(ProdID)4020 0.67941 22.92148 0.0296 0.9763545   
## factor(ProdID)4021 40.96969 22.92575 1.7871 0.0739744 .   
## factor(ProdID)4022 47.87160 22.84221 2.0958 0.0361428 \*   
## factor(ProdID)4023 124.55017 22.84221 5.4526 5.146e-08 \*\*\*  
## factor(ProdID)4025 11.47958 22.93208 0.5006 0.6166766   
## factor(ProdID)4026 53.44302 22.84221 2.3397 0.0193314 \*   
## factor(ProdID)4027 41.32143 22.83368 1.8097 0.0703931 .   
## factor(ProdID)4030 89.80017 22.84221 3.9313 8.536e-05 \*\*\*  
## factor(ProdID)4031 116.47874 22.84221 5.0993 3.506e-07 \*\*\*  
## factor(ProdID)4033 -15.34639 22.92428 -0.6694 0.5032396   
## factor(ProdID)4034 -7.06738 25.82682 -0.2736 0.7843661   
## factor(ProdID)4035 -18.06738 25.82682 -0.6996 0.4842279   
## factor(ProdID)4036 110.67857 22.83368 4.8472 1.281e-06 \*\*\*  
## factor(ProdID)4041 -14.36909 24.90371 -0.5770 0.5639690   
## factor(ProdID)4046 29.92831 25.05512 1.1945 0.2323266   
## factor(ProdID)4047 148.68049 24.76061 6.0047 2.020e-09 \*\*\*  
## factor(ProdID)4049 0.98011 25.12093 0.0390 0.9688790   
## factor(ProdID)4050 83.53582 24.17767 3.4551 0.0005536 \*\*\*  
## factor(ProdID)4051 0.02113 24.48652 0.0009 0.9993115   
## factor(ProdID)4052 -0.10957 27.35886 -0.0040 0.9968047   
## factor(ProdID)4053 130.90815 22.93208 5.7085 1.190e-08 \*\*\*  
## factor(ProdID)4055 -10.21429 22.83368 -0.4473 0.6546487   
## factor(ProdID)4056 215.65731 22.84221 9.4412 < 2.2e-16 \*\*\*  
## factor(ProdID)4057 95.06092 22.93506 4.1448 3.445e-05 \*\*\*  
## factor(ProdID)4058 -7.28571 22.83368 -0.3191 0.7496780   
## factor(ProdID)4059 161.80017 22.84221 7.0834 1.555e-12 \*\*\*  
## factor(ProdID)4060 64.30100 22.93208 2.8040 0.0050627 \*\*   
## factor(ProdID)4061 -17.45497 26.01356 -0.6710 0.5022475   
## factor(ProdID)4063 -40.95381 24.75725 -1.6542 0.0981321 .   
## factor(ProdID)4064 180.95165 23.94330 7.5575 4.675e-14 \*\*\*  
## factor(ProdID)4065 39.53166 23.04552 1.7154 0.0863246 .   
## factor(ProdID)4067 -1.64183 29.50889 -0.0556 0.9556315   
## factor(ProdID)4068 151.76445 22.84221 6.6440 3.300e-11 \*\*\*  
## factor(ProdID)4069 26.64286 22.83368 1.1668 0.2433247   
## factor(ProdID)4071 49.07896 23.52244 2.0865 0.0369746 \*   
## factor(ProdID)4072 47.21752 24.76608 1.9065 0.0566243 .   
## factor(ProdID)4073 98.89100 23.63129 4.1847 2.892e-05 \*\*\*  
## factor(ProdID)4074 42.56267 25.03643 1.7000 0.0891732 .   
## factor(ProdID)4075 9.93828 26.80308 0.3708 0.7108072   
## factor(ProdID)4076 152.17006 23.52652 6.4680 1.065e-10 \*\*\*  
## factor(ProdID)4077 29.81218 23.78435 1.2534 0.2100919   
## factor(ProdID)4078 229.62398 23.78159 9.6555 < 2.2e-16 \*\*\*  
## factor(ProdID)4079 18.39388 23.51686 0.7822 0.4341508   
## factor(ProdID)4080 155.62208 23.30600 6.6773 2.635e-11 \*\*\*  
## factor(ProdID)4082 90.11274 23.77258 3.7906 0.0001516 \*\*\*  
## factor(ProdID)4083 19.07481 23.61911 0.8076 0.4193500   
## factor(ProdID)4084 137.70003 23.28058 5.9148 3.492e-09 \*\*\*  
## factor(ProdID)4085 41.77696 23.28058 1.7945 0.0727802 .   
## factor(ProdID)4087 194.01612 23.63661 8.2083 2.682e-16 \*\*\*  
## factor(ProdID)4088 192.86029 23.53998 8.1929 3.045e-16 \*\*\*  
## factor(ProdID)4089 -14.20938 25.52598 -0.5567 0.5777765   
## factor(ProdID)4090 26.02251 23.51690 1.1065 0.2685315   
## factor(ProdID)4092 34.04195 23.88591 1.4252 0.1541504   
## factor(ProdID)4093 20.48633 27.99035 0.7319 0.4642518   
## factor(ProdID)4094 5.91490 27.99035 0.2113 0.8326447   
## factor(ProdID)4095 -45.61525 26.41343 -1.7270 0.0842202 .   
## factor(ProdID)4096 184.47461 24.36013 7.5728 4.160e-14 \*\*\*  
## factor(ProdID)4097 118.44351 23.54437 5.0307 5.019e-07 \*\*\*  
## factor(ProdID)4098 150.08764 23.78595 6.3099 2.975e-10 \*\*\*  
## factor(ProdID)4099 46.58465 23.28058 2.0010 0.0454330 \*   
## factor(ProdID)4100 20.93818 24.06516 0.8701 0.3842988   
## factor(ProdID)4101 -4.70015 23.27148 -0.2020 0.8399462   
## factor(ProdID)4103 65.45992 24.06516 2.7201 0.0065434 \*\*   
## factor(ProdID)4104 -10.62796 24.08727 -0.4412 0.6590632   
## factor(ProdID)4105 45.64764 24.04985 1.8980 0.0577348 .   
## factor(ProdID)4106 74.26357 31.50973 2.3568 0.0184604 \*   
## factor(ProdID)4107 142.99898 23.78159 6.0130 1.920e-09 \*\*\*  
## factor(ProdID)4108 -66.13192 27.12345 -2.4382 0.0147879 \*   
## factor(ProdID)4109 -63.49622 26.58524 -2.3884 0.0169503 \*   
## factor(ProdID)4111 114.39339 24.40923 4.6865 2.836e-06 \*\*\*  
## factor(ProdID)4112 38.97016 23.37997 1.6668 0.0955987 .   
## factor(ProdID)4113 -38.67684 25.94484 -1.4907 0.1360801   
## factor(ProdID)4114 81.75322 24.17767 3.3814 0.0007256 \*\*\*  
## factor(ProdID)4116 25.79279 24.36013 1.0588 0.2897248   
## factor(ProdID)4117 3.99810 23.80392 0.1680 0.8666201   
## factor(ProdID)4118 242.20749 23.56146 10.2798 < 2.2e-16 \*\*\*  
## factor(ProdID)4119 149.07162 23.31247 6.3945 1.723e-10 \*\*\*  
## factor(ProdID)4120 232.73348 24.68449 9.4283 < 2.2e-16 \*\*\*  
## factor(ProdID)4121 42.06861 24.06516 1.7481 0.0804918 .   
## factor(ProdID)4122 2.15619 24.13799 0.0893 0.9288242   
## factor(ProdID)4123 89.98374 24.05636 3.7405 0.0001852 \*\*\*  
## factor(ProdID)4124 20.46789 23.51636 0.8704 0.3841314   
## factor(ProdID)4125 154.52931 23.83485 6.4833 9.631e-11 \*\*\*  
## factor(ProdID)4127 96.80837 24.13799 4.0106 6.124e-05 \*\*\*  
## factor(ProdID)4128 203.33519 23.89682 8.5089 < 2.2e-16 \*\*\*  
## factor(ProdID)4129 24.02379 23.77179 1.0106 0.3122452   
## factor(ProdID)4131 21.19905 24.06516 0.8809 0.3784035   
## factor(ProdID)4133 85.50480 24.77089 3.4518 0.0005604 \*\*\*  
## factor(ProdID)4135 -17.18981 26.94248 -0.6380 0.5234839   
## factor(ProdID)4141 24.36089 24.06010 1.0125 0.3113360   
## factor(ProdID)4145 45.47592 25.17994 1.8060 0.0709587 .   
## factor(ProdID)4152 15.10159 24.67391 0.6120 0.5405282   
## factor(ProdID)4157 33.43896 23.52244 1.4216 0.1551970   
## factor(ProdID)4158 29.75218 25.94031 1.1469 0.2514454   
## factor(ProdID)4179 155.41946 24.29499 6.3972 1.693e-10 \*\*\*  
## factor(ProdID)4180 47.31267 25.03643 1.8898 0.0588354 .   
## factor(ProdID)4181 8.72064 24.67391 0.3534 0.7237734   
## factor(ProdID)4182 -31.50957 27.35886 -1.1517 0.2494812   
## factor(ProdID)4189 185.70824 23.84487 7.7882 7.861e-15 \*\*\*  
## factor(ProdID)4190 107.80633 23.82767 4.5244 6.164e-06 \*\*\*  
## factor(ProdID)4191 9.23802 24.67330 0.3744 0.7081087   
## factor(ProdID)4193 353.78294 25.04793 14.1242 < 2.2e-16 \*\*\*  
## factor(ProdID)4194 15.65215 24.77459 0.6318 0.5275515   
## factor(ProdID)4195 197.26267 25.03643 7.8790 3.841e-15 \*\*\*  
## factor(ProdID)4202 32.16267 25.03643 1.2846 0.1989657   
## factor(ProdID)4203 26.91267 25.03643 1.0749 0.2824413   
## factor(ProdID)4204 11.35250 26.84703 0.4229 0.6724125   
## factor(ProdID)4205 74.88765 28.00323 2.6743 0.0075084 \*\*   
## factor(ProdID)4206 105.72808 25.83888 4.0918 4.332e-05 \*\*\*  
## factor(ProdID)4207 52.88765 28.00323 1.8886 0.0589863 .   
## factor(ProdID)4208 149.24036 26.32826 5.6684 1.503e-08 \*\*\*  
## factor(ProdID)4209 170.81326 25.87038 6.6027 4.358e-11 \*\*\*  
## factor(ProdID)4210 180.75828 26.54092 6.8106 1.059e-11 \*\*\*  
## factor(ProdID)4211 3.57303 27.98967 0.1277 0.8984258   
## factor(ProdID)4212 105.56752 29.52181 3.5759 0.0003515 \*\*\*  
## factor(ProdID)4213 53.44849 28.92805 1.8476 0.0647005 .   
## factor(ProdID)4214 65.56852 25.84609 2.5369 0.0112076 \*   
## factor(ProdID)4215 46.13166 26.80803 1.7208 0.0853320 .   
## factor(ProdID)4216 41.65341 26.30765 1.5833 0.1133973   
## factor(ProdID)4217 18.22532 26.29937 0.6930 0.4883378   
## factor(ProdID)4218 340.02815 25.41968 13.3766 < 2.2e-16 \*\*\*  
## factor(ProdID)4219 56.29131 25.41968 2.2145 0.0268305 \*   
## factor(ProdID)4220 142.81763 25.41968 5.6184 2.007e-08 \*\*\*  
## factor(ProdID)4225 58.63828 25.89524 2.2644 0.0235798 \*   
## factor(ProdID)4226 65.10250 26.84703 2.4249 0.0153379 \*   
## factor(ProdID)4227 124.55265 27.38256 4.5486 5.498e-06 \*\*\*  
## factor(ProdID)4228 119.13353 25.85670 4.6075 4.154e-06 \*\*\*  
## factor(ProdID)4229 13.02079 26.38835 0.4934 0.6217258   
## factor(ProdID)4230 43.14901 26.81730 1.6090 0.1076652   
## factor(ProdID)4231 95.58669 26.95190 3.5466 0.0003930 \*\*\*  
## factor(ProdID)4232 71.53051 28.00323 2.5544 0.0106607 \*   
## factor(ProdID)4233 112.55447 25.41968 4.4278 9.674e-06 \*\*\*  
## factor(ProdID)4235 42.46061 26.29937 1.6145 0.1064653   
## factor(ProdID)4236 102.69773 38.48964 2.6682 0.0076450 \*\*   
## factor(ProdID)4237 35.67336 28.00323 1.2739 0.2027438   
## factor(ProdID)4238 35.25771 25.87038 1.3629 0.1729738   
## factor(ProdID)4239 73.03051 28.00323 2.6079 0.0091300 \*\*   
## factor(ProdID)4240 54.23418 29.52181 1.8371 0.0662424 .   
## factor(ProdID)4241 50.79704 27.45346 1.8503 0.0643162 .   
## factor(ProdID)4242 0.67730 26.79366 0.0253 0.9798336   
## factor(ProdID)4243 76.67730 26.79366 2.8618 0.0042263 \*\*   
## factor(ProdID)4244 140.96952 30.44879 4.6297 3.733e-06 \*\*\*  
## factor(ProdID)4245 158.98936 26.80152 5.9321 3.145e-09 \*\*\*  
## factor(ProdID)4246 42.20151 26.28595 1.6055 0.1084373   
## factor(ProdID)4247 17.15063 26.28596 0.6525 0.5141254   
## factor(ProdID)4248 50.48418 29.52181 1.7101 0.0873018 .   
## factor(ProdID)4249 24.50667 26.80803 0.9142 0.3606700   
## factor(ProdID)4250 47.44416 26.80803 1.7698 0.0768117 .   
## factor(ProdID)4251 246.37535 28.28781 8.7096 < 2.2e-16 \*\*\*  
## factor(ProdID)4263 21.17336 28.00323 0.7561 0.4496140   
## factor(Wk)2 -26.91337 9.66735 -2.7839 0.0053857 \*\*   
## factor(Wk)3 38.41846 9.54506 4.0250 5.763e-05 \*\*\*  
## factor(Wk)4 52.64677 9.33360 5.6406 1.766e-08 \*\*\*  
## factor(Wk)5 8.97023 9.18753 0.9763 0.3289280   
## factor(Wk)6 35.78616 9.01145 3.9712 7.229e-05 \*\*\*  
## factor(Wk)7 77.60695 8.97074 8.6511 < 2.2e-16 \*\*\*  
## factor(Wk)8 19.49542 8.91595 2.1866 0.0288090 \*   
## factor(Wk)9 -22.07315 8.82785 -2.5004 0.0124298 \*   
## factor(Wk)10 109.21579 8.79507 12.4178 < 2.2e-16 \*\*\*  
## factor(Wk)11 56.37022 8.80176 6.4044 1.615e-10 \*\*\*  
## factor(Wk)12 -6.07854 8.76408 -0.6936 0.4879740   
## factor(Wk)13 -23.44925 8.72809 -2.6866 0.0072358 \*\*   
## factor(Wk)14 49.06019 8.73659 5.6155 2.041e-08 \*\*\*  
## factor(Wk)15 26.03349 8.70379 2.9911 0.0027906 \*\*   
## factor(Wk)16 -11.35985 8.69942 -1.3058 0.1916612   
## factor(Wk)17 -34.50022 8.68731 -3.9713 7.224e-05 \*\*\*  
## factor(Wk)18 40.59809 8.68161 4.6763 2.980e-06 \*\*\*  
## factor(Wk)19 24.51958 8.75995 2.7991 0.0051404 \*\*   
## factor(Wk)20 10.39407 8.80130 1.1810 0.2376580   
## factor(Wk)21 -36.37482 8.82954 -4.1197 3.841e-05 \*\*\*  
## factor(Wk)22 -46.76732 8.91503 -5.2459 1.604e-07 \*\*\*  
## factor(Wk)23 17.23627 8.91861 1.9326 0.0533267 .   
## factor(Wk)24 -15.70367 8.91805 -1.7609 0.0783048 .   
## factor(Wk)25 -26.54003 8.91685 -2.9764 0.0029274 \*\*   
## factor(Wk)26 -55.11208 9.03609 -6.0991 1.128e-09 \*\*\*  
## factor(Wk)27 -55.62279 9.14851 -6.0800 1.270e-09 \*\*\*  
## factor(Wk)28 -87.19429 9.14728 -9.5323 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 106630000  
## Residual Sum of Squares: 47423000  
## R-Squared: 0.55525  
## Adj. R-Squared: 0.53266  
## F-statistic: 24.5797 on 330 and 6497 DF, p-value: < 2.22e-16

model7 <- plm(Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk + HomePgWk + CatPgWk + I(VidWk\*CatPgWk) +  
 factor(ProdID) + factor(Wk), index=c("ProdID", "Wk"), data = fp\_sales, model = 'pooling')  
summary(model7)

## Pooling Model  
##   
## Call:  
## plm(formula = Sales ~ VidWk + PriceDiscWk + EmailWk + CatalogWk +   
## HomePgWk + CatPgWk + I(VidWk \* CatPgWk) + factor(ProdID) +   
## factor(Wk), data = fp\_sales, model = "pooling", index = c("ProdID",   
## "Wk"))  
##   
## Unbalanced Panel: n = 297, T = 2-28, N = 6828  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -648.4027 -38.0795 -4.3498 28.1881 1861.6515   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 23.69724 17.52784 1.3520 0.1764297   
## VidWk 14.68658 5.12247 2.8671 0.0041560 \*\*   
## PriceDiscWk 75.96087 5.82443 13.0418 < 2.2e-16 \*\*\*  
## EmailWk 70.18226 22.03676 3.1848 0.0014555 \*\*   
## CatalogWk 104.26083 17.00240 6.1321 9.180e-10 \*\*\*  
## HomePgWk 61.41184 9.41252 6.5245 7.338e-11 \*\*\*  
## CatPgWk 13.09572 11.39264 1.1495 0.2503964   
## I(VidWk \* CatPgWk) 78.85696 25.02408 3.1512 0.0016332 \*\*   
## factor(ProdID)2143 167.53152 22.83556 7.3364 2.461e-13 \*\*\*  
## factor(ProdID)2413 43.74581 22.83556 1.9157 0.0554487 .   
## factor(ProdID)2461 18.42376 22.83160 0.8069 0.4197301   
## factor(ProdID)2532 53.47828 25.81935 2.0712 0.0383750 \*   
## factor(ProdID)2637 22.56724 22.83556 0.9882 0.3230672   
## factor(ProdID)2663 62.28152 22.83556 2.7274 0.0064009 \*\*   
## factor(ProdID)2700 29.38866 22.83556 1.2870 0.1981509   
## factor(ProdID)2716 73.56724 22.83556 3.2216 0.0012810 \*\*   
## factor(ProdID)2800 112.56724 22.83556 4.9295 8.450e-07 \*\*\*  
## factor(ProdID)3133 17.99349 25.40115 0.7084 0.4787389   
## factor(ProdID)3164 94.78152 22.83556 4.1506 3.358e-05 \*\*\*  
## factor(ProdID)3251 52.50917 24.04361 2.1839 0.0290042 \*   
## factor(ProdID)3253 93.24860 22.82798 4.0848 4.464e-05 \*\*\*  
## factor(ProdID)3261 272.79721 25.02271 10.9020 < 2.2e-16 \*\*\*  
## factor(ProdID)3269 91.51388 25.02911 3.6563 0.0002579 \*\*\*  
## factor(ProdID)3292 2.99581 22.83556 0.1312 0.8956287   
## factor(ProdID)3311 96.71009 22.83556 4.2351 2.316e-05 \*\*\*  
## factor(ProdID)3329 43.38866 22.83556 1.9000 0.0574710 .   
## factor(ProdID)3339 95.24581 22.83556 4.1709 3.073e-05 \*\*\*  
## factor(ProdID)3364 62.10295 22.83556 2.7196 0.0065540 \*\*   
## factor(ProdID)3381 56.75326 23.22348 2.4438 0.0145604 \*   
## factor(ProdID)3383 74.35481 23.04761 3.2261 0.0012609 \*\*   
## factor(ProdID)3408 38.60925 22.84638 1.6900 0.0910854 .   
## factor(ProdID)3409 60.85583 22.84886 2.6634 0.0077545 \*\*   
## factor(ProdID)3413 -10.14492 62.69238 -0.1618 0.8714522   
## factor(ProdID)3416 190.53152 22.83556 8.3436 < 2.2e-16 \*\*\*  
## factor(ProdID)3418 166.85295 22.83556 7.3067 3.065e-13 \*\*\*  
## factor(ProdID)3435 32.92438 22.83556 1.4418 0.1494062   
## factor(ProdID)3479 36.51623 24.40210 1.4964 0.1345881   
## factor(ProdID)3511 52.84243 22.82951 2.3147 0.0206628 \*   
## factor(ProdID)3561 29.50000 22.82703 1.2923 0.1962897   
## factor(ProdID)3618 4.06724 22.83556 0.1781 0.8586423   
## factor(ProdID)3619 -4.11238 26.78660 -0.1535 0.8779899   
## factor(ProdID)3642 37.14495 25.81935 1.4386 0.1502985   
## factor(ProdID)3643 105.06724 22.83556 4.6010 4.284e-06 \*\*\*  
## factor(ProdID)3659 -5.57562 22.83556 -0.2442 0.8071115   
## factor(ProdID)3671 190.17438 22.83556 8.3280 < 2.2e-16 \*\*\*  
## factor(ProdID)3677 69.16962 23.04761 3.0012 0.0026997 \*\*   
## factor(ProdID)3678 -16.39705 22.83556 -0.7180 0.4727529   
## factor(ProdID)3680 67.97357 24.77088 2.7441 0.0060845 \*\*   
## factor(ProdID)3696 -9.29791 23.40726 -0.3972 0.6912158   
## factor(ProdID)3701 123.92438 22.83556 5.4268 5.944e-08 \*\*\*  
## factor(ProdID)3723 -28.12469 22.98665 -1.2235 0.2211767   
## factor(ProdID)3727 -8.32680 27.98162 -0.2976 0.7660323   
## factor(ProdID)3728 -6.61238 26.78660 -0.2469 0.8050289   
## factor(ProdID)3729 32.88866 22.83556 1.4402 0.1498480   
## factor(ProdID)3730 -7.13283 25.81935 -0.2763 0.7823578   
## factor(ProdID)3741 46.35295 22.83556 2.0299 0.0424116 \*   
## factor(ProdID)3743 22.56724 22.83556 0.9882 0.3230672   
## factor(ProdID)3745 116.17438 22.83556 5.0874 3.731e-07 \*\*\*  
## factor(ProdID)3746 42.35295 22.83556 1.8547 0.0636854 .   
## factor(ProdID)3747 75.71009 22.83556 3.3154 0.0009200 \*\*\*  
## factor(ProdID)3749 -4.21703 25.40115 -0.1660 0.8681483   
## factor(ProdID)3751 32.85295 22.83556 1.4387 0.1502908   
## factor(ProdID)3753 19.96009 22.83556 0.8741 0.3821073   
## factor(ProdID)3757 -29.30905 24.69461 -1.1869 0.2353262   
## factor(ProdID)3759 -16.16620 24.69461 -0.6546 0.5127198   
## factor(ProdID)3765 -2.96848 22.83556 -0.1300 0.8965755   
## factor(ProdID)3770 -4.60714 22.82703 -0.2018 0.8400572   
## factor(ProdID)3771 7.61459 28.69248 0.2654 0.7907202   
## factor(ProdID)3778 11.85295 22.83556 0.5191 0.6037389   
## factor(ProdID)3785 19.22998 28.69248 0.6702 0.5027479   
## factor(ProdID)3788 -8.69310 28.69248 -0.3030 0.7619187   
## factor(ProdID)3808 -14.07263 27.35069 -0.5145 0.6069020   
## factor(ProdID)3809 4.21009 22.83556 0.1844 0.8537324   
## factor(ProdID)3810 16.46009 22.83556 0.7208 0.4710526   
## factor(ProdID)3811 51.89286 22.82703 2.2733 0.0230402 \*   
## factor(ProdID)3864 84.46009 22.83556 3.6986 0.0002186 \*\*\*  
## factor(ProdID)3880 126.92438 22.83556 5.5582 2.834e-08 \*\*\*  
## factor(ProdID)3887 407.17075 22.85729 17.8136 < 2.2e-16 \*\*\*  
## factor(ProdID)3888 134.88762 26.78660 5.0356 4.891e-07 \*\*\*  
## factor(ProdID)3889 -0.73659 24.75480 -0.0298 0.9762630   
## factor(ProdID)3890 -8.75859 30.43443 -0.2878 0.7735200   
## factor(ProdID)3891 65.46009 22.83556 2.8666 0.0041626 \*\*   
## factor(ProdID)3893 82.76179 22.92575 3.6100 0.0003085 \*\*\*  
## factor(ProdID)3894 15.94534 26.33140 0.6056 0.5448257   
## factor(ProdID)3895 24.64286 22.82703 1.0795 0.2803840   
## factor(ProdID)3897 17.95175 23.03881 0.7792 0.4358927   
## factor(ProdID)3898 117.56724 22.83556 5.1484 2.704e-07 \*\*\*  
## factor(ProdID)3902 26.50000 22.82703 1.1609 0.2457235   
## factor(ProdID)3904 85.13804 22.83160 3.7290 0.0001939 \*\*\*  
## factor(ProdID)3905 201.74581 22.83556 8.8347 < 2.2e-16 \*\*\*  
## factor(ProdID)3906 222.06724 22.83556 9.7246 < 2.2e-16 \*\*\*  
## factor(ProdID)3907 136.13137 24.68216 5.5154 3.614e-08 \*\*\*  
## factor(ProdID)3908 33.19162 25.44474 1.3045 0.1921234   
## factor(ProdID)3909 9.82143 22.82703 0.4303 0.6670249   
## factor(ProdID)3911 33.62079 23.51108 1.4300 0.1527657   
## factor(ProdID)3912 89.35714 22.82703 3.9145 9.151e-05 \*\*\*  
## factor(ProdID)3913 -2.03991 22.83556 -0.0893 0.9288222   
## factor(ProdID)3914 54.72315 24.05307 2.2751 0.0229324 \*   
## factor(ProdID)3915 70.85295 22.83556 3.1027 0.0019256 \*\*   
## factor(ProdID)3917 -26.96927 26.78736 -1.0068 0.3140728   
## factor(ProdID)3918 -8.16670 26.27953 -0.3108 0.7559910   
## factor(ProdID)3924 81.01179 22.92575 3.5337 0.0004127 \*\*\*  
## factor(ProdID)3925 69.77101 22.82951 3.0562 0.0022509 \*\*   
## factor(ProdID)3926 83.73529 22.82951 3.6679 0.0002466 \*\*\*  
## factor(ProdID)3927 36.02101 22.82951 1.5778 0.1146541   
## factor(ProdID)3928 23.10932 24.07442 0.9599 0.3371353   
## factor(ProdID)3929 13.06724 22.83556 0.5722 0.5671847   
## factor(ProdID)3930 -23.61665 25.20669 -0.9369 0.3488345   
## factor(ProdID)3931 3.74399 29.68559 0.1261 0.8996398   
## factor(ProdID)3932 65.88866 22.83556 2.8854 0.0039226 \*\*   
## factor(ProdID)3933 2.31559 24.74997 0.0936 0.9254623   
## factor(ProdID)3935 10.46770 25.14537 0.4163 0.6772136   
## factor(ProdID)3936 62.31724 22.83556 2.7290 0.0063706 \*\*   
## factor(ProdID)3937 11.64286 22.82703 0.5100 0.6100359   
## factor(ProdID)3938 243.64041 22.97227 10.6058 < 2.2e-16 \*\*\*  
## factor(ProdID)3939 91.63421 23.21784 3.9467 8.007e-05 \*\*\*  
## factor(ProdID)3940 36.64154 22.84886 1.6036 0.1088402   
## factor(ProdID)3942 72.46009 22.83556 3.1731 0.0015151 \*\*   
## factor(ProdID)3943 258.46009 22.83556 11.3183 < 2.2e-16 \*\*\*  
## factor(ProdID)3945 95.86894 22.92575 4.1817 2.931e-05 \*\*\*  
## factor(ProdID)3946 73.23027 22.91557 3.1957 0.0014018 \*\*   
## factor(ProdID)3948 220.50945 22.96653 9.6013 < 2.2e-16 \*\*\*  
## factor(ProdID)3950 -10.09535 22.92575 -0.4403 0.6596985   
## factor(ProdID)3951 8.93463 24.74997 0.3610 0.7181144   
## factor(ProdID)3952 -5.55963 22.92575 -0.2425 0.8083957   
## factor(ProdID)3953 167.38866 22.83556 7.3302 2.578e-13 \*\*\*  
## factor(ProdID)3954 36.50210 22.84638 1.5977 0.1101541   
## factor(ProdID)3955 33.38525 22.83918 1.4618 0.1438572   
## factor(ProdID)3956 68.39624 22.95156 2.9800 0.0028929 \*\*   
## factor(ProdID)3959 53.89576 23.26471 2.3166 0.0205547 \*   
## factor(ProdID)3960 57.38866 22.83556 2.5131 0.0119906 \*   
## factor(ProdID)3962 103.88525 22.83918 4.5486 5.500e-06 \*\*\*  
## factor(ProdID)3964 160.56724 22.83556 7.0315 2.253e-12 \*\*\*  
## factor(ProdID)3965 53.84932 22.85729 2.3559 0.0185078 \*   
## factor(ProdID)3966 33.92438 22.83556 1.4856 0.1374350   
## factor(ProdID)3967 133.82003 22.82798 5.8621 4.795e-09 \*\*\*  
## factor(ProdID)3984 100.28152 22.83556 4.3915 1.144e-05 \*\*\*  
## factor(ProdID)3987 163.93851 25.04130 6.5467 6.331e-11 \*\*\*  
## factor(ProdID)3988 110.86388 25.02911 4.4294 9.605e-06 \*\*\*  
## factor(ProdID)3990 67.01470 24.04643 2.7869 0.0053371 \*\*   
## factor(ProdID)3992 75.94037 22.92575 3.3124 0.0009299 \*\*\*  
## factor(ProdID)3993 207.74290 23.08196 9.0002 < 2.2e-16 \*\*\*  
## factor(ProdID)3995 -15.47148 25.82565 -0.5991 0.5491443   
## factor(ProdID)3997 43.18695 22.93124 1.8833 0.0597011 .   
## factor(ProdID)3998 1.03152 22.83556 0.0452 0.9639718   
## factor(ProdID)4002 307.09176 27.41000 11.2036 < 2.2e-16 \*\*\*  
## factor(ProdID)4004 82.84914 23.39472 3.5414 0.0004009 \*\*\*  
## factor(ProdID)4005 96.46009 22.83556 4.2241 2.432e-05 \*\*\*  
## factor(ProdID)4006 111.67438 22.83556 4.8904 1.031e-06 \*\*\*  
## factor(ProdID)4007 88.99581 22.83556 3.8972 9.827e-05 \*\*\*  
## factor(ProdID)4008 21.71429 22.82703 0.9513 0.3415113   
## factor(ProdID)4010 690.32508 22.96137 30.0646 < 2.2e-16 \*\*\*  
## factor(ProdID)4011 22.83742 22.91557 0.9966 0.3190008   
## factor(ProdID)4018 12.95150 23.00456 0.5630 0.5734562   
## factor(ProdID)4020 1.05170 22.91557 0.0459 0.9633956   
## factor(ProdID)4021 41.07271 22.91878 1.7921 0.0731638 .   
## factor(ProdID)4022 47.74581 22.83556 2.0909 0.0365800 \*   
## factor(ProdID)4023 124.42438 22.83556 5.4487 5.260e-08 \*\*\*  
## factor(ProdID)4025 11.72608 22.92575 0.5115 0.6090319   
## factor(ProdID)4026 53.31724 22.83556 2.3348 0.0195824 \*   
## factor(ProdID)4027 41.32143 22.82703 1.8102 0.0703114 .   
## factor(ProdID)4030 89.67438 22.83556 3.9270 8.692e-05 \*\*\*  
## factor(ProdID)4031 116.35295 22.83556 5.0953 3.581e-07 \*\*\*  
## factor(ProdID)4033 -14.41600 22.92106 -0.6289 0.5294096   
## factor(ProdID)4034 -7.24394 25.81935 -0.2806 0.7790548   
## factor(ProdID)4035 -18.24394 25.81935 -0.7066 0.4798406   
## factor(ProdID)4036 110.67857 22.82703 4.8486 1.272e-06 \*\*\*  
## factor(ProdID)4041 -14.22613 24.89574 -0.5714 0.5677291   
## factor(ProdID)4046 30.95586 25.04946 1.2358 0.2165816   
## factor(ProdID)4047 149.19566 24.75466 6.0270 1.762e-09 \*\*\*  
## factor(ProdID)4049 2.16144 25.11561 0.0861 0.9314216   
## factor(ProdID)4050 83.91653 24.17142 3.4717 0.0005205 \*\*\*  
## factor(ProdID)4051 0.42392 24.48026 0.0173 0.9861843   
## factor(ProdID)4052 -0.25170 27.35091 -0.0092 0.9926577   
## factor(ProdID)4053 131.15465 22.92575 5.7208 1.107e-08 \*\*\*  
## factor(ProdID)4055 -10.21429 22.82703 -0.4475 0.6545547   
## factor(ProdID)4056 215.53152 22.83556 9.4384 < 2.2e-16 \*\*\*  
## factor(ProdID)4057 93.04920 22.93250 4.0575 5.018e-05 \*\*\*  
## factor(ProdID)4058 -7.28571 22.82703 -0.3192 0.7496075   
## factor(ProdID)4059 161.67438 22.83556 7.0799 1.594e-12 \*\*\*  
## factor(ProdID)4060 64.54751 22.92575 2.8155 0.0048848 \*\*   
## factor(ProdID)4061 -17.05241 26.00681 -0.6557 0.5120468   
## factor(ProdID)4063 -40.58918 24.74997 -1.6400 0.1010601   
## factor(ProdID)4064 170.85149 24.12219 7.0828 1.562e-12 \*\*\*  
## factor(ProdID)4065 39.54434 23.03881 1.7164 0.0861324 .   
## factor(ProdID)4067 -1.93796 29.50041 -0.0657 0.9476245   
## factor(ProdID)4068 151.63866 22.83556 6.6405 3.380e-11 \*\*\*  
## factor(ProdID)4069 26.64286 22.82703 1.1672 0.2431876   
## factor(ProdID)4071 48.97992 23.51558 2.0829 0.0373020 \*   
## factor(ProdID)4072 44.72172 24.76589 1.8058 0.0709992 .   
## factor(ProdID)4073 96.67972 23.62901 4.0916 4.337e-05 \*\*\*  
## factor(ProdID)4074 42.51388 25.02911 1.6986 0.0894466 .   
## factor(ProdID)4075 10.81012 26.79701 0.4034 0.6866616   
## factor(ProdID)4076 152.69609 23.52047 6.4921 9.093e-11 \*\*\*  
## factor(ProdID)4077 32.22557 23.72688 1.3582 0.1744510   
## factor(ProdID)4078 229.53002 23.77465 9.6544 < 2.2e-16 \*\*\*  
## factor(ProdID)4079 19.06079 23.51108 0.8107 0.4175589   
## factor(ProdID)4080 155.61811 23.29886 6.6792 2.601e-11 \*\*\*  
## factor(ProdID)4082 90.11662 23.76566 3.7919 0.0001509 \*\*\*  
## factor(ProdID)4083 20.15869 23.61676 0.8536 0.3933715   
## factor(ProdID)4084 137.58356 23.27379 5.9115 3.562e-09 \*\*\*  
## factor(ProdID)4085 41.66048 23.27379 1.7900 0.0734978 .   
## factor(ProdID)4087 194.65752 23.63198 8.2370 < 2.2e-16 \*\*\*  
## factor(ProdID)4088 192.78314 23.53231 8.1923 3.060e-16 \*\*\*  
## factor(ProdID)4089 -14.57403 25.51764 -0.5711 0.5679276   
## factor(ProdID)4090 29.42461 23.54925 1.2495 0.2115300   
## factor(ProdID)4092 35.13128 23.88361 1.4709 0.1413566   
## factor(ProdID)4093 20.40188 27.98219 0.7291 0.4659654   
## factor(ProdID)4094 5.83045 27.98219 0.2084 0.8349522   
## factor(ProdID)4095 -45.09028 26.40576 -1.7076 0.0877598 .   
## factor(ProdID)4096 184.40358 24.35301 7.5721 4.183e-14 \*\*\*  
## factor(ProdID)4097 117.53363 23.53474 4.9940 6.067e-07 \*\*\*  
## factor(ProdID)4098 149.67953 23.77854 6.2947 3.280e-10 \*\*\*  
## factor(ProdID)4099 46.46817 23.27379 1.9966 0.0459116 \*   
## factor(ProdID)4100 21.54508 24.05921 0.8955 0.3705518   
## factor(ProdID)4101 -4.68116 23.26471 -0.2012 0.8405384   
## factor(ProdID)4103 66.06682 24.05921 2.7460 0.0060491 \*\*   
## factor(ProdID)4104 -10.85136 24.07816 -0.4507 0.6522408   
## factor(ProdID)4105 45.72826 24.04287 1.9019 0.0572223 .   
## factor(ProdID)4106 74.20041 31.50053 2.3555 0.0185259 \*   
## factor(ProdID)4107 142.90502 23.77465 6.0108 1.946e-09 \*\*\*  
## factor(ProdID)4108 -64.88594 27.12049 -2.3925 0.0167620 \*   
## factor(ProdID)4109 -62.35806 26.58173 -2.3459 0.0190111 \*   
## factor(ProdID)4111 114.28896 24.40210 4.6836 2.877e-06 \*\*\*  
## factor(ProdID)4112 39.25462 23.37362 1.6794 0.0931141 .   
## factor(ProdID)4113 -37.32517 25.93988 -1.4389 0.1502240   
## factor(ProdID)4114 82.13392 24.17142 3.3980 0.0006829 \*\*\*  
## factor(ProdID)4116 25.72176 24.35301 1.0562 0.2909141   
## factor(ProdID)4117 3.10843 23.79412 0.1306 0.8960651   
## factor(ProdID)4118 242.07905 23.55459 10.2774 < 2.2e-16 \*\*\*  
## factor(ProdID)4119 148.68620 23.30331 6.3805 1.887e-10 \*\*\*  
## factor(ProdID)4120 232.67479 24.67727 9.4287 < 2.2e-16 \*\*\*  
## factor(ProdID)4121 42.67551 24.05921 1.7738 0.0761480 .   
## factor(ProdID)4122 2.45449 24.13145 0.1017 0.9189873   
## factor(ProdID)4123 90.16644 24.04941 3.7492 0.0001789 \*\*\*  
## factor(ProdID)4124 20.20814 23.50921 0.8596 0.3900500   
## factor(ProdID)4125 154.69507 23.82741 6.4923 9.077e-11 \*\*\*  
## factor(ProdID)4127 97.10667 24.13145 4.0241 5.785e-05 \*\*\*  
## factor(ProdID)4128 203.15618 23.88688 8.5049 < 2.2e-16 \*\*\*  
## factor(ProdID)4129 24.07658 23.76488 1.0131 0.3110424   
## factor(ProdID)4131 21.80595 24.05921 0.9063 0.3647869   
## factor(ProdID)4133 85.70177 24.76388 3.4608 0.0005421 \*\*\*  
## factor(ProdID)4135 -16.41766 26.93567 -0.6095 0.5422054   
## factor(ProdID)4141 24.28837 24.05307 1.0098 0.3126372   
## factor(ProdID)4145 45.99984 25.17393 1.8273 0.0677034 .   
## factor(ProdID)4152 15.15471 24.66674 0.6144 0.5389869   
## factor(ProdID)4157 33.33992 23.51558 1.4178 0.1563029   
## factor(ProdID)4158 30.23571 25.93275 1.1659 0.2436865   
## factor(ProdID)4179 148.20021 24.37372 6.0803 1.267e-09 \*\*\*  
## factor(ProdID)4180 47.26388 25.02911 1.8884 0.0590226 .   
## factor(ProdID)4181 8.77376 24.66674 0.3557 0.7220829   
## factor(ProdID)4182 -31.65170 27.35091 -1.1572 0.2472148   
## factor(ProdID)4189 186.06748 23.83861 7.8053 6.873e-15 \*\*\*  
## factor(ProdID)4190 107.61342 23.82066 4.5177 6.364e-06 \*\*\*  
## factor(ProdID)4191 9.34705 24.66615 0.3789 0.7047430   
## factor(ProdID)4193 354.13851 25.04130 14.1422 < 2.2e-16 \*\*\*  
## factor(ProdID)4194 15.99959 24.76802 0.6460 0.5183165   
## factor(ProdID)4195 197.21388 25.02911 7.8794 3.831e-15 \*\*\*  
## factor(ProdID)4202 32.11388 25.02911 1.2831 0.1995163   
## factor(ProdID)4203 26.86388 25.02911 1.0733 0.2831738   
## factor(ProdID)4204 11.38867 26.83816 0.4243 0.6713274   
## factor(ProdID)4205 74.88985 27.99507 2.6751 0.0074892 \*\*   
## factor(ProdID)4206 105.70454 25.83134 4.0921 4.327e-05 \*\*\*  
## factor(ProdID)4207 52.88985 27.99507 1.8893 0.0589020 .   
## factor(ProdID)4208 148.33628 26.31790 5.6363 1.810e-08 \*\*\*  
## factor(ProdID)4209 170.82013 25.86182 6.6051 4.287e-11 \*\*\*  
## factor(ProdID)4210 183.03813 26.54872 6.8944 5.918e-12 \*\*\*  
## factor(ProdID)4211 3.82680 27.98162 0.1368 0.8912237   
## factor(ProdID)4212 105.55673 29.51320 3.5766 0.0003506 \*\*\*  
## factor(ProdID)4213 53.80757 28.91973 1.8606 0.0628481 .   
## factor(ProdID)4214 65.12610 25.83779 2.5206 0.0117400 \*   
## factor(ProdID)4215 46.13363 26.80022 1.7214 0.0852277 .   
## factor(ProdID)4216 42.55558 26.30197 1.6180 0.1057194   
## factor(ProdID)4217 18.20827 26.29170 0.6925 0.4886180   
## factor(ProdID)4218 339.98256 25.41225 13.3787 < 2.2e-16 \*\*\*  
## factor(ProdID)4219 56.24572 25.41225 2.2133 0.0269094 \*   
## factor(ProdID)4220 142.77204 25.41225 5.6182 2.009e-08 \*\*\*  
## factor(ProdID)4225 57.35812 25.88239 2.2161 0.0267187 \*   
## factor(ProdID)4226 65.13867 26.83816 2.4271 0.0152474 \*   
## factor(ProdID)4227 125.58648 27.37703 4.5873 4.575e-06 \*\*\*  
## factor(ProdID)4228 118.95366 25.84900 4.6019 4.267e-06 \*\*\*  
## factor(ProdID)4229 13.46599 26.38164 0.5104 0.6097675   
## factor(ProdID)4230 44.12765 26.81171 1.6458 0.0998461 .   
## factor(ProdID)4231 99.79071 26.97642 3.6992 0.0002181 \*\*\*  
## factor(ProdID)4232 71.53270 27.99507 2.5552 0.0106356 \*   
## factor(ProdID)4233 112.50888 25.41225 4.4273 9.696e-06 \*\*\*  
## factor(ProdID)4235 42.44356 26.29170 1.6143 0.1065038   
## factor(ProdID)4236 102.79916 38.47845 2.6716 0.0075678 \*\*   
## factor(ProdID)4237 35.67556 27.99507 1.2744 0.2025844   
## factor(ProdID)4238 35.26457 25.86182 1.3636 0.1727480   
## factor(ProdID)4239 73.03270 27.99507 2.6088 0.0091076 \*\*   
## factor(ProdID)4240 54.22339 29.51320 1.8373 0.0662173 .   
## factor(ProdID)4241 50.89663 27.44549 1.8545 0.0637183 .   
## factor(ProdID)4242 0.82603 26.78591 0.0308 0.9753996   
## factor(ProdID)4243 76.82603 26.78591 2.8682 0.0041421 \*\*   
## factor(ProdID)4244 140.94710 30.43991 4.6303 3.722e-06 \*\*\*  
## factor(ProdID)4245 158.74023 26.79323 5.9246 3.290e-09 \*\*\*  
## factor(ProdID)4246 42.39164 26.27837 1.6132 0.1067547   
## factor(ProdID)4247 17.27169 26.27835 0.6573 0.5110373   
## factor(ProdID)4248 50.47339 29.51320 1.7102 0.0872772 .   
## factor(ProdID)4249 24.50863 26.80022 0.9145 0.3604915   
## factor(ProdID)4250 47.44613 26.80022 1.7704 0.0767135 .   
## factor(ProdID)4251 252.12836 28.34001 8.8966 < 2.2e-16 \*\*\*  
## factor(ProdID)4263 21.17556 27.99507 0.7564 0.4494349   
## factor(Wk)2 -27.10464 9.66481 -2.8045 0.0050550 \*\*   
## factor(Wk)3 38.62834 9.54220 4.0482 5.222e-05 \*\*\*  
## factor(Wk)4 52.52530 9.33100 5.6291 1.887e-08 \*\*\*  
## factor(Wk)5 9.21475 9.18513 1.0032 0.3157898   
## factor(Wk)6 35.54891 9.00929 3.9458 8.037e-05 \*\*\*  
## factor(Wk)7 77.59475 8.96812 8.6523 < 2.2e-16 \*\*\*  
## factor(Wk)8 19.40979 8.91346 2.1776 0.0294730 \*   
## factor(Wk)9 -22.30619 8.82586 -2.5274 0.0115156 \*   
## factor(Wk)10 109.31572 8.79077 12.4353 < 2.2e-16 \*\*\*  
## factor(Wk)11 56.16160 8.79979 6.3822 1.867e-10 \*\*\*  
## factor(Wk)12 -6.09961 8.76096 -0.6962 0.4863123   
## factor(Wk)13 -23.94250 8.72720 -2.7434 0.0060967 \*\*   
## factor(Wk)14 48.86774 8.73459 5.5947 2.300e-08 \*\*\*  
## factor(Wk)15 25.81700 8.70194 2.9668 0.0030200 \*\*   
## factor(Wk)16 -11.98860 8.69957 -1.3781 0.1682298   
## factor(Wk)17 -34.95988 8.68664 -4.0246 5.773e-05 \*\*\*  
## factor(Wk)18 40.15826 8.68107 4.6260 3.801e-06 \*\*\*  
## factor(Wk)19 24.03546 8.75949 2.7439 0.0060874 \*\*   
## factor(Wk)20 9.95941 8.80043 1.1317 0.2578040   
## factor(Wk)21 -36.75266 8.82831 -4.1630 3.181e-05 \*\*\*  
## factor(Wk)22 -47.05234 8.91342 -5.2788 1.342e-07 \*\*\*  
## factor(Wk)23 16.83387 8.91780 1.8877 0.0591146 .   
## factor(Wk)24 -16.11873 8.91728 -1.8076 0.0707177 .   
## factor(Wk)25 -27.01638 8.91631 -3.0300 0.0024552 \*\*   
## factor(Wk)26 -55.48575 9.03470 -6.1414 8.663e-10 \*\*\*  
## factor(Wk)27 -55.36303 9.14260 -6.0555 1.478e-09 \*\*\*  
## factor(Wk)28 -87.28579 9.14450 -9.5452 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 106630000  
## Residual Sum of Squares: 47396000  
## R-Squared: 0.55551  
## Adj. R-Squared: 0.53293  
## F-statistic: 24.6055 on 330 and 6497 DF, p-value: < 2.22e-16

## Testing the interaction between video and various promotions for Coordinating Products ##  
model8 <- plm(CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk + FpHomePgWk + FpCatPgWk + CpPriceDiscWk +  
 CpEmailWk + CpCatalogWk + CpHomePgWk + CpCatPgWk + I(VidWk\*CpPriceDiscWk) + factor(CpordID) + factor(Wk),  
 data = cp\_sales, model = 'pooling', index = c('CpordID', "Wk"))  
summary(model8)

## Pooling Model  
##   
## Call:  
## plm(formula = CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk +   
## FpHomePgWk + FpCatPgWk + CpPriceDiscWk + CpEmailWk + CpCatalogWk +   
## CpHomePgWk + CpCatPgWk + I(VidWk \* CpPriceDiscWk) + factor(CpordID) +   
## factor(Wk), data = cp\_sales, model = "pooling", index = c("CpordID",   
## "Wk"))  
##   
## Unbalanced Panel: n = 196, T = 8-28, N = 4708  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -936.7912 -22.7818 -2.7745 17.8544 1342.6518   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 0.52556 13.91517 0.0378 0.9698734   
## VidWk 22.04963 4.31207 5.1135 3.295e-07 \*\*\*  
## FpPriceDiscWk -4.29340 5.00049 -0.8586 0.3906100   
## FpEmailWk -6.50444 17.23363 -0.3774 0.7058740   
## FpCatalogWk -9.70379 9.12737 -1.0632 0.2877699   
## FpHomePgWk 13.54294 6.19300 2.1868 0.0288078 \*   
## FpCatPgWk 6.50670 5.57554 1.1670 0.2432688   
## CpPriceDiscWk 91.64569 5.40686 16.9499 < 2.2e-16 \*\*\*  
## CpEmailWk 72.43158 20.26274 3.5746 0.0003544 \*\*\*  
## CpCatalogWk 103.76993 16.82656 6.1670 7.572e-10 \*\*\*  
## CpHomePgWk 63.87760 15.55320 4.1070 4.079e-05 \*\*\*  
## CpCatPgWk 51.46444 14.45080 3.5614 0.0003728 \*\*\*  
## I(VidWk \* CpPriceDiscWk) -16.30302 9.91796 -1.6438 0.1002904   
## factor(CpordID)1661 33.02643 18.16786 1.8178 0.0691541 .   
## factor(CpordID)1973 9.13521 18.14908 0.5033 0.6147480   
## factor(CpordID)1974 1.62009 18.21341 0.0890 0.9291251   
## factor(CpordID)2143 202.00124 18.21178 11.0918 < 2.2e-16 \*\*\*  
## factor(CpordID)2357 -5.69900 18.13802 -0.3142 0.7533824   
## factor(CpordID)2518 -1.34250 19.62782 -0.0684 0.9454720   
## factor(CpordID)2532 88.70326 20.53616 4.3194 1.599e-05 \*\*\*  
## factor(CpordID)2592 34.42887 20.53544 1.6766 0.0936987 .   
## factor(CpordID)2679 3.40602 18.17629 0.1874 0.8513650   
## factor(CpordID)2690 3.62030 18.17629 0.1992 0.8421331   
## factor(CpordID)2716 108.81323 18.18308 5.9843 2.343e-09 \*\*\*  
## factor(CpordID)2757 130.92611 18.10629 7.2310 5.613e-13 \*\*\*  
## factor(CpordID)2758 240.11603 18.15610 13.2251 < 2.2e-16 \*\*\*  
## factor(CpordID)2759 84.48969 18.47277 4.5737 4.920e-06 \*\*\*  
## factor(CpordID)2763 151.24731 19.60464 7.7149 1.483e-14 \*\*\*  
## factor(CpordID)2841 6.19459 18.16213 0.3411 0.7330655   
## factor(CpordID)2863 14.12030 18.17629 0.7769 0.4372866   
## factor(CpordID)2881 -8.72979 22.79355 -0.3830 0.7017425   
## factor(CpordID)2885 -2.05541 18.16213 -0.1132 0.9099009   
## factor(CpordID)2909 1.13360 20.51042 0.0553 0.9559263   
## factor(CpordID)3025 8.83459 18.17629 0.4861 0.6269554   
## factor(CpordID)3042 27.45691 24.13525 1.1376 0.2553371   
## factor(CpordID)3123 27.42735 18.08333 1.5167 0.1294081   
## factor(CpordID)3124 1.24412 18.15489 0.0685 0.9453681   
## factor(CpordID)3164 130.18085 18.18125 7.1602 9.375e-13 \*\*\*  
## factor(CpordID)3205 17.63737 21.74101 0.8112 0.4172659   
## factor(CpordID)3207 3.31911 20.20584 0.1643 0.8695299   
## factor(CpordID)3209 5.68753 20.20584 0.2815 0.7783555   
## factor(CpordID)3251 87.53376 19.16182 4.5681 5.053e-06 \*\*\*  
## factor(CpordID)3253 126.76091 18.18911 6.9691 3.657e-12 \*\*\*  
## factor(CpordID)3309 983.51651 18.28980 53.7740 < 2.2e-16 \*\*\*  
## factor(CpordID)3317 44.75656 18.19199 2.4602 0.0139221 \*   
## factor(CpordID)3349 6.06280 19.90459 0.3046 0.7606901   
## factor(CpordID)3423 38.58459 18.17629 2.1228 0.0338255 \*   
## factor(CpordID)3435 67.55703 18.20790 3.7103 0.0002095 \*\*\*  
## factor(CpordID)3441 15.61626 19.67126 0.7939 0.4273182   
## factor(CpordID)3446 11.20628 18.16890 0.6168 0.5374088   
## factor(CpordID)3462 20.40174 18.15818 1.1236 0.2612616   
## factor(CpordID)3466 15.29887 18.17629 0.8417 0.4000042   
## factor(CpordID)3474 -1.84398 18.17629 -0.1014 0.9191979   
## factor(CpordID)3479 74.47886 19.45049 3.8291 0.0001303 \*\*\*  
## factor(CpordID)3483 7.08459 18.17629 0.3898 0.6967245   
## factor(CpordID)3484 51.86328 18.21465 2.8473 0.0044288 \*\*   
## factor(CpordID)3485 -17.05951 23.39124 -0.7293 0.4658490   
## factor(CpordID)3487 -11.61389 23.42897 -0.4957 0.6201260   
## factor(CpordID)3490 -11.40471 18.46206 -0.6177 0.5367798   
## factor(CpordID)3492 19.50475 19.62291 0.9940 0.3202871   
## factor(CpordID)3494 56.67327 20.46043 2.7699 0.0056305 \*\*   
## factor(CpordID)3496 44.72544 18.13330 2.4665 0.0136820 \*   
## factor(CpordID)3500 191.14671 18.26460 10.4654 < 2.2e-16 \*\*\*  
## factor(CpordID)3506 26.42897 18.10027 1.4601 0.1443211   
## factor(CpordID)3508 -1.43656 18.10757 -0.0793 0.9367700   
## factor(CpordID)3509 95.25706 24.21277 3.9342 8.475e-05 \*\*\*  
## factor(CpordID)3570 2.42406 22.79355 0.1063 0.9153108   
## factor(CpordID)3573 20.09486 18.15026 1.1071 0.2682933   
## factor(CpordID)3576 78.64846 18.14975 4.3333 1.501e-05 \*\*\*  
## factor(CpordID)3577 11.72745 18.17629 0.6452 0.5188269   
## factor(CpordID)3578 -4.11014 18.08369 -0.2273 0.8202131   
## factor(CpordID)3580 16.92364 18.17617 0.9311 0.3518576   
## factor(CpordID)3585 2.55278 23.42897 0.1090 0.9132406   
## factor(CpordID)3619 30.88477 21.30625 1.4496 0.1472503   
## factor(CpordID)3622 21.91241 18.11925 1.2093 0.2265944   
## factor(CpordID)3627 45.55972 18.24393 2.4973 0.0125516 \*   
## factor(CpordID)3628 62.66824 18.21048 3.4413 0.0005842 \*\*\*  
## factor(CpordID)3671 224.80703 18.20790 12.3467 < 2.2e-16 \*\*\*  
## factor(CpordID)3674 -17.65135 22.36490 -0.7892 0.4300117   
## factor(CpordID)3675 19.70449 22.80172 0.8642 0.3875426   
## factor(CpordID)3678 17.03587 18.20070 0.9360 0.3493233   
## factor(CpordID)3680 97.97347 19.70612 4.9717 6.884e-07 \*\*\*  
## factor(CpordID)3711 10.52964 20.20584 0.5211 0.6023099   
## factor(CpordID)3720 51.05278 23.42897 2.1790 0.0293804 \*   
## factor(CpordID)3721 4.17823 19.81318 0.2109 0.8329894   
## factor(CpordID)3729 67.52132 18.20790 3.7084 0.0002111 \*\*\*  
## factor(CpordID)3749 31.94748 20.20647 1.5811 0.1139369   
## factor(CpordID)3751 68.25228 18.18125 3.7540 0.0001762 \*\*\*  
## factor(CpordID)3765 32.43085 18.18125 1.7838 0.0745316 .   
## factor(CpordID)3812 -2.05827 18.17629 -0.1132 0.9098460   
## factor(CpordID)3815 15.75384 18.16039 0.8675 0.3857238   
## factor(CpordID)3816 13.19173 18.17629 0.7258 0.4680202   
## factor(CpordID)3817 6.64383 18.15923 0.3659 0.7144830   
## factor(CpordID)3818 -2.95022 18.13772 -0.1627 0.8707959   
## factor(CpordID)3821 13.95012 19.69024 0.7085 0.4786847   
## factor(CpordID)3822 10.83737 21.74101 0.4985 0.6181731   
## factor(CpordID)3824 1.99200 18.16890 0.1096 0.9127016   
## factor(CpordID)3829 17.58459 18.17629 0.9674 0.3333731   
## factor(CpordID)3835 13.40602 18.17629 0.7376 0.4608234   
## factor(CpordID)3839 24.30608 18.16544 1.3380 0.1809514   
## factor(CpordID)3842 9.48442 20.53544 0.4619 0.6442069   
## factor(CpordID)3843 6.50888 18.15818 0.3585 0.7200202   
## factor(CpordID)3848 -4.14284 23.39124 -0.1771 0.8594294   
## factor(CpordID)3852 3.70739 18.13828 0.2044 0.8380534   
## factor(CpordID)3854 23.93745 18.15818 1.3183 0.1874796   
## factor(CpordID)3857 21.95722 18.08299 1.2142 0.2247174   
## factor(CpordID)3861 42.58907 18.29408 2.3280 0.0199552 \*   
## factor(CpordID)3864 119.09275 18.20790 6.5407 6.809e-11 \*\*\*  
## factor(CpordID)3866 14.04460 18.15818 0.7735 0.4392921   
## factor(CpordID)3871 57.32227 21.30625 2.6904 0.0071632 \*\*   
## factor(CpordID)3873 294.42922 18.49811 15.9167 < 2.2e-16 \*\*\*  
## factor(CpordID)3875 63.01219 22.80172 2.7635 0.0057422 \*\*   
## factor(CpordID)3876 109.69775 20.90501 5.2474 1.614e-07 \*\*\*  
## factor(CpordID)3877 61.37580 19.81085 3.0981 0.0019598 \*\*   
## factor(CpordID)3878 34.62090 18.15393 1.9071 0.0565749 .   
## factor(CpordID)3880 161.55703 18.20790 8.8729 < 2.2e-16 \*\*\*  
## factor(CpordID)3881 96.09501 18.50081 5.1941 2.149e-07 \*\*\*  
## factor(CpordID)3885 34.47138 21.75019 1.5849 0.1130649   
## factor(CpordID)3886 63.30929 18.12286 3.4933 0.0004816 \*\*\*  
## factor(CpordID)3891 84.43344 20.90553 4.0388 5.462e-05 \*\*\*  
## factor(CpordID)3895 58.20834 18.16047 3.2052 0.0013591 \*\*   
## factor(CpordID)3904 118.04672 18.17134 6.4963 9.129e-11 \*\*\*  
## factor(CpordID)3905 164.55108 20.90553 7.8712 4.375e-15 \*\*\*  
## factor(CpordID)3915 106.25228 18.18125 5.8441 5.456e-09 \*\*\*  
## factor(CpordID)3916 96.22085 24.31554 3.9572 7.702e-05 \*\*\*  
## factor(CpordID)3919 -1.69222 18.51859 -0.0914 0.9271953   
## factor(CpordID)3925 102.63508 18.19307 5.6414 1.790e-08 \*\*\*  
## factor(CpordID)3926 117.36604 18.16941 6.4595 1.162e-10 \*\*\*  
## factor(CpordID)3929 47.69989 18.20790 2.6197 0.0088295 \*\*   
## factor(CpordID)3937 44.86185 19.64098 2.2841 0.0224127 \*   
## factor(CpordID)3938 277.84642 18.31046 15.1742 < 2.2e-16 \*\*\*  
## factor(CpordID)3942 108.55255 18.19804 5.9651 2.634e-09 \*\*\*  
## factor(CpordID)3944 19.93244 18.10455 1.1010 0.2709721   
## factor(CpordID)3949 99.86751 18.16242 5.4986 4.042e-08 \*\*\*  
## factor(CpordID)3954 72.41844 18.23731 3.9709 7.273e-05 \*\*\*  
## factor(CpordID)3955 67.89968 20.54994 3.3041 0.0009602 \*\*\*  
## factor(CpordID)3959 100.07504 22.25654 4.4964 7.085e-06 \*\*\*  
## factor(CpordID)3960 92.02132 18.20790 5.0539 4.501e-07 \*\*\*  
## factor(CpordID)3961 8.44167 18.26336 0.4622 0.6439470   
## factor(CpordID)3965 86.85520 18.25885 4.7569 2.028e-06 \*\*\*  
## factor(CpordID)3968 27.44989 18.20790 1.5076 0.1317323   
## factor(CpordID)3969 15.46289 18.18266 0.8504 0.3951374   
## factor(CpordID)3970 24.33745 18.16213 1.3400 0.1803100   
## factor(CpordID)3972 37.41535 18.26670 2.0483 0.0405907 \*   
## factor(CpordID)3973 22.00471 19.64098 1.1203 0.2626262   
## factor(CpordID)3974 37.76316 18.17629 2.0776 0.0378026 \*   
## factor(CpordID)3975 5.63698 18.15489 0.3105 0.7561999   
## factor(CpordID)3976 10.56071 18.14683 0.5820 0.5606236   
## factor(CpordID)3978 24.74273 18.09329 1.3675 0.1715346   
## factor(CpordID)3979 55.08188 18.14995 3.0348 0.0024206 \*\*   
## factor(CpordID)3981 1.72098 18.09910 0.0951 0.9242502   
## factor(CpordID)3982 48.89942 18.19199 2.6880 0.0072155 \*\*   
## factor(CpordID)3984 135.68085 18.18125 7.4627 1.013e-13 \*\*\*  
## factor(CpordID)3985 64.85127 18.15489 3.5721 0.0003578 \*\*\*  
## factor(CpordID)3986 45.60127 18.15489 2.5118 0.0120470 \*   
## factor(CpordID)3995 17.62190 20.54994 0.8575 0.3912058   
## factor(CpordID)4001 26.25126 18.15512 1.4459 0.1482632   
## factor(CpordID)4006 145.91180 18.20069 8.0168 1.374e-15 \*\*\*  
## factor(CpordID)4007 124.39514 18.18125 6.8419 8.868e-12 \*\*\*  
## factor(CpordID)4009 104.89020 18.11488 5.7903 7.508e-09 \*\*\*  
## factor(CpordID)4013 5.78960 20.53468 0.2819 0.7780004   
## factor(CpordID)4014 20.92176 18.12737 1.1542 0.2484991   
## factor(CpordID)4015 -6.34078 18.11365 -0.3501 0.7263135   
## factor(CpordID)4016 66.83459 18.17629 3.6770 0.0002387 \*\*\*  
## factor(CpordID)4017 18.08674 18.10108 0.9992 0.3177482   
## factor(CpordID)4019 27.97745 18.17629 1.5392 0.1238194   
## factor(CpordID)4028 19.26848 18.82260 1.0237 0.3060379   
## factor(CpordID)4031 151.75228 18.18125 8.3466 < 2.2e-16 \*\*\*  
## factor(CpordID)4032 34.08459 18.17629 1.8752 0.0608272 .   
## factor(CpordID)4037 39.34418 18.11025 2.1725 0.0298718 \*   
## factor(CpordID)4038 15.15622 18.27691 0.8293 0.4070043   
## factor(CpordID)4040 67.22037 18.15180 3.7032 0.0002154 \*\*\*  
## factor(CpordID)4042 37.24235 18.14908 2.0520 0.0402254 \*   
## factor(CpordID)4043 24.95322 18.18350 1.3723 0.1700389   
## factor(CpordID)4055 23.50453 18.15928 1.2944 0.1956101   
## factor(CpordID)4063 -10.48217 19.68291 -0.5326 0.5943704   
## factor(CpordID)4068 187.03800 18.18125 10.2874 < 2.2e-16 \*\*\*  
## factor(CpordID)4069 59.59500 18.18279 3.2775 0.0010551 \*\*   
## factor(CpordID)4074 79.77900 19.99350 3.9902 6.706e-05 \*\*\*  
## factor(CpordID)4084 175.05253 18.54964 9.4370 < 2.2e-16 \*\*\*  
## factor(CpordID)4088 226.63642 18.80993 12.0488 < 2.2e-16 \*\*\*  
## factor(CpordID)4089 16.52702 20.34967 0.8122 0.4167476   
## factor(CpordID)4118 278.74019 18.79153 14.8333 < 2.2e-16 \*\*\*  
## factor(CpordID)4134 37.92191 19.61099 1.9337 0.0532122 .   
## factor(CpordID)4136 18.81264 21.86686 0.8603 0.3896551   
## factor(CpordID)4137 38.46335 22.96856 1.6746 0.0940809 .   
## factor(CpordID)4140 37.64720 19.92049 1.8899 0.0588395 .   
## factor(CpordID)4142 29.81008 19.64157 1.5177 0.1291599   
## factor(CpordID)4143 36.11689 18.68101 1.9333 0.0532564 .   
## factor(CpordID)4144 59.91018 18.81523 3.1841 0.0014619 \*\*   
## factor(CpordID)4147 -3.46965 19.65506 -0.1765 0.8598880   
## factor(CpordID)4151 75.01757 27.38317 2.7396 0.0061767 \*\*   
## factor(CpordID)4153 46.91533 22.82253 2.0557 0.0398734 \*   
## factor(CpordID)4154 25.17654 19.90015 1.2651 0.2058859   
## factor(CpordID)4155 49.79740 18.64416 2.6709 0.0075914 \*\*   
## factor(CpordID)4156 188.42320 18.75580 10.0461 < 2.2e-16 \*\*\*  
## factor(CpordID)4160 15.92489 22.96856 0.6933 0.4881357   
## factor(CpordID)4162 6.10822 19.88010 0.3073 0.7586651   
## factor(CpordID)4163 23.44856 19.96341 1.1746 0.2402264   
## factor(CpordID)4164 106.52021 19.98578 5.3298 1.032e-07 \*\*\*  
## factor(CpordID)4170 14.29947 19.58766 0.7300 0.4654135   
## factor(CpordID)4178 59.33796 19.94101 2.9757 0.0029391 \*\*   
## factor(CpordID)4190 141.99567 18.99650 7.4748 9.247e-14 \*\*\*  
## factor(CpordID)4191 43.15729 19.64844 2.1965 0.0281092 \*   
## factor(CpordID)4198 39.00021 19.85072 1.9647 0.0495138 \*   
## factor(CpordID)4206 142.29724 20.56607 6.9190 5.192e-12 \*\*\*  
## factor(CpordID)4212 137.53429 23.68187 5.8076 6.777e-09 \*\*\*  
## factor(CpordID)4251 273.39010 22.89719 11.9399 < 2.2e-16 \*\*\*  
## factor(Wk)2 -17.15694 7.56413 -2.2682 0.0233647 \*   
## factor(Wk)3 24.62026 7.51537 3.2760 0.0010610 \*\*   
## factor(Wk)4 36.11200 7.47901 4.8284 1.422e-06 \*\*\*  
## factor(Wk)5 12.76774 7.46388 1.7106 0.0872236 .   
## factor(Wk)6 27.98697 7.47443 3.7444 0.0001831 \*\*\*  
## factor(Wk)7 51.63418 7.43876 6.9412 4.445e-12 \*\*\*  
## factor(Wk)8 11.40681 7.40637 1.5401 0.1235981   
## factor(Wk)9 -11.59672 7.31683 -1.5849 0.1130512   
## factor(Wk)10 56.25646 7.29258 7.7142 1.491e-14 \*\*\*  
## factor(Wk)11 24.11238 7.35506 3.2783 0.0010522 \*\*   
## factor(Wk)12 -8.08323 7.37097 -1.0966 0.2728622   
## factor(Wk)13 -3.05067 8.17677 -0.3731 0.7090994   
## factor(Wk)14 9.25112 7.48143 1.2365 0.2163213   
## factor(Wk)15 -4.35010 7.48600 -0.5811 0.5612035   
## factor(Wk)16 -17.47568 7.49710 -2.3310 0.0197979 \*   
## factor(Wk)17 -27.73759 7.48065 -3.7079 0.0002115 \*\*\*  
## factor(Wk)18 9.47757 7.51554 1.2611 0.2073515   
## factor(Wk)19 -5.86911 7.60802 -0.7714 0.4404888   
## factor(Wk)20 -3.71854 7.65585 -0.4857 0.6271952   
## factor(Wk)21 -58.72264 8.36142 -7.0230 2.498e-12 \*\*\*  
## factor(Wk)22 -27.98513 7.84964 -3.5652 0.0003674 \*\*\*  
## factor(Wk)23 -4.88811 7.85141 -0.6226 0.5335942   
## factor(Wk)24 -19.00501 7.86396 -2.4167 0.0157008 \*   
## factor(Wk)25 -32.92030 7.86924 -4.1834 2.927e-05 \*\*\*  
## factor(Wk)26 -78.18370 8.98566 -8.7009 < 2.2e-16 \*\*\*  
## factor(Wk)27 -65.96634 9.14101 -7.2165 6.234e-13 \*\*\*  
## factor(Wk)28 -85.22842 9.09801 -9.3678 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 65211000  
## Residual Sum of Squares: 20449000  
## R-Squared: 0.68641  
## Adj. R-Squared: 0.67  
## F-statistic: 41.841 on 234 and 4473 DF, p-value: < 2.22e-16

model9 <- plm(CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk + FpHomePgWk + FpCatPgWk + CpPriceDiscWk +  
 CpEmailWk + CpCatalogWk + CpHomePgWk + CpCatPgWk + I(VidWk\*CpEmailWk) + factor(CpordID) + factor(Wk),  
 data = cp\_sales, model = 'pooling', index = c('CpordID', "Wk"))  
summary(model9)

## Pooling Model  
##   
## Call:  
## plm(formula = CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk +   
## FpHomePgWk + FpCatPgWk + CpPriceDiscWk + CpEmailWk + CpCatalogWk +   
## CpHomePgWk + CpCatPgWk + I(VidWk \* CpEmailWk) + factor(CpordID) +   
## factor(Wk), data = cp\_sales, model = "pooling", index = c("CpordID",   
## "Wk"))  
##   
## Unbalanced Panel: n = 196, T = 8-28, N = 4708  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -936.3699 -22.8387 -2.8365 17.9199 1343.2311   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 0.40614 13.91117 0.0292 0.9767099   
## VidWk 21.18555 4.22447 5.0150 5.510e-07 \*\*\*  
## FpPriceDiscWk -4.42155 4.99959 -0.8844 0.3765375   
## FpEmailWk -5.87939 17.22922 -0.3412 0.7329351   
## FpCatalogWk -9.59775 9.12329 -1.0520 0.2928540   
## FpHomePgWk 13.48149 6.19121 2.1775 0.0294937 \*   
## FpCatPgWk 6.76573 5.56811 1.2151 0.2243981   
## CpPriceDiscWk 89.57915 5.19970 17.2277 < 2.2e-16 \*\*\*  
## CpEmailWk 94.64579 22.82229 4.1471 3.430e-05 \*\*\*  
## CpCatalogWk 101.85981 16.84233 6.0478 1.588e-09 \*\*\*  
## CpHomePgWk 61.89060 15.58576 3.9710 7.270e-05 \*\*\*  
## CpCatPgWk 56.42809 14.63557 3.8555 0.0001171 \*\*\*  
## I(VidWk \* CpEmailWk) -108.58503 46.77887 -2.3212 0.0203186 \*   
## factor(CpordID)1661 33.10349 18.16244 1.8226 0.0684254 .   
## factor(CpordID)1973 9.37581 18.14392 0.5167 0.6053588   
## factor(CpordID)1974 0.14366 18.19298 0.0079 0.9936998   
## factor(CpordID)2143 201.81130 18.20425 11.0859 < 2.2e-16 \*\*\*  
## factor(CpordID)2357 -6.19432 18.13091 -0.3416 0.7326346   
## factor(CpordID)2518 -1.23088 19.62205 -0.0627 0.9499846   
## factor(CpordID)2532 88.60441 20.52923 4.3160 1.623e-05 \*\*\*  
## factor(CpordID)2592 34.43771 20.52912 1.6775 0.0935136 .   
## factor(CpordID)2679 3.63079 18.17101 0.1998 0.8416366   
## factor(CpordID)2690 3.84507 18.17101 0.2116 0.8324250   
## factor(CpordID)2716 108.68728 18.17630 5.9796 2.411e-09 \*\*\*  
## factor(CpordID)2757 131.13505 18.10058 7.2448 5.075e-13 \*\*\*  
## factor(CpordID)2758 240.25483 18.15069 13.2367 < 2.2e-16 \*\*\*  
## factor(CpordID)2759 85.07609 18.46018 4.6086 4.166e-06 \*\*\*  
## factor(CpordID)2763 151.66965 19.59723 7.7393 1.227e-14 \*\*\*  
## factor(CpordID)2841 6.41926 18.15691 0.3535 0.7236974   
## factor(CpordID)2863 14.34507 18.17101 0.7894 0.4298918   
## factor(CpordID)2881 -8.60400 22.78683 -0.3776 0.7057558   
## factor(CpordID)2885 -1.83074 18.15691 -0.1008 0.9196911   
## factor(CpordID)2909 -1.60737 20.50985 -0.0784 0.9375366   
## factor(CpordID)3025 9.05936 18.17101 0.4986 0.6181130   
## factor(CpordID)3042 27.50648 24.12798 1.1400 0.2543374   
## factor(CpordID)3123 26.82917 18.07457 1.4844 0.1377839   
## factor(CpordID)3124 1.49178 18.14971 0.0822 0.9344970   
## factor(CpordID)3164 130.05948 18.17447 7.1562 9.650e-13 \*\*\*  
## factor(CpordID)3205 17.69976 21.73450 0.8144 0.4154807   
## factor(CpordID)3207 3.31574 20.19956 0.1641 0.8696211   
## factor(CpordID)3209 5.68416 20.19956 0.2814 0.7784164   
## factor(CpordID)3251 87.52076 19.15577 4.5689 5.035e-06 \*\*\*  
## factor(CpordID)3253 126.76427 18.18341 6.9714 3.596e-12 \*\*\*  
## factor(CpordID)3309 983.68103 18.28434 53.7991 < 2.2e-16 \*\*\*  
## factor(CpordID)3317 44.62146 18.18522 2.4537 0.0141765 \*   
## factor(CpordID)3349 6.04833 19.89835 0.3040 0.7611715   
## factor(CpordID)3423 38.80936 18.17101 2.1358 0.0327511 \*   
## factor(CpordID)3435 67.41278 18.20114 3.7038 0.0002150 \*\*\*  
## factor(CpordID)3441 15.77046 19.66558 0.8019 0.4226350   
## factor(CpordID)3446 11.42619 18.16365 0.6291 0.5293360   
## factor(CpordID)3462 20.64024 18.15296 1.1370 0.2555918   
## factor(CpordID)3466 15.52364 18.17101 0.8543 0.3929798   
## factor(CpordID)3474 -1.61921 18.17101 -0.0891 0.9289987   
## factor(CpordID)3479 74.45871 19.44341 3.8295 0.0001302 \*\*\*  
## factor(CpordID)3483 7.30936 18.17101 0.4023 0.6875164   
## factor(CpordID)3484 50.43666 18.18724 2.7732 0.0055740 \*\*   
## factor(CpordID)3485 -16.57835 23.38185 -0.7090 0.4783451   
## factor(CpordID)3487 -11.63678 23.42151 -0.4968 0.6193253   
## factor(CpordID)3490 -12.85687 18.44471 -0.6970 0.4858082   
## factor(CpordID)3492 19.43761 19.61630 0.9909 0.3217924   
## factor(CpordID)3494 56.14604 20.45229 2.7452 0.0060712 \*\*   
## factor(CpordID)3496 44.51289 18.12803 2.4555 0.0141077 \*   
## factor(CpordID)3500 191.84659 18.25355 10.5101 < 2.2e-16 \*\*\*  
## factor(CpordID)3506 26.63781 18.09464 1.4721 0.1410539   
## factor(CpordID)3508 -0.96511 18.09977 -0.0533 0.9574781   
## factor(CpordID)3509 95.22787 24.20503 3.9342 8.473e-05 \*\*\*  
## factor(CpordID)3570 2.54985 22.78683 0.1119 0.9109077   
## factor(CpordID)3573 20.32850 18.14507 1.1203 0.2626325   
## factor(CpordID)3576 78.89565 18.14462 4.3482 1.403e-05 \*\*\*  
## factor(CpordID)3577 11.95222 18.17101 0.6578 0.5107242   
## factor(CpordID)3578 -4.71537 18.07474 -0.2609 0.7941957   
## factor(CpordID)3580 17.13915 18.17091 0.9432 0.3456195   
## factor(CpordID)3585 2.52989 23.42151 0.1080 0.9139881   
## factor(CpordID)3619 30.79380 21.29921 1.4458 0.1483112   
## factor(CpordID)3622 22.27298 18.11206 1.2297 0.2188620   
## factor(CpordID)3627 46.03640 18.23488 2.5246 0.0116162 \*   
## factor(CpordID)3628 63.16929 18.20110 3.4706 0.0005241 \*\*\*  
## factor(CpordID)3671 224.66278 18.20114 12.3433 < 2.2e-16 \*\*\*  
## factor(CpordID)3674 -17.24591 22.35664 -0.7714 0.4405108   
## factor(CpordID)3675 19.67132 22.79455 0.8630 0.3881929   
## factor(CpordID)3678 16.88675 18.19384 0.9282 0.3533760   
## factor(CpordID)3680 97.72832 19.69922 4.9610 7.272e-07 \*\*\*  
## factor(CpordID)3711 10.52627 20.19956 0.5211 0.6023134   
## factor(CpordID)3720 51.02989 23.42151 2.1788 0.0294014 \*   
## factor(CpordID)3721 4.67940 19.80465 0.2363 0.8132280   
## factor(CpordID)3729 67.37706 18.20114 3.7018 0.0002166 \*\*\*  
## factor(CpordID)3749 31.84209 20.19958 1.5764 0.1150103   
## factor(CpordID)3751 68.13091 18.17447 3.7487 0.0001800 \*\*\*  
## factor(CpordID)3765 32.30948 18.17447 1.7777 0.0755145 .   
## factor(CpordID)3812 -1.83350 18.17101 -0.1009 0.9196324   
## factor(CpordID)3815 15.99125 18.15528 0.8808 0.3784709   
## factor(CpordID)3816 13.41650 18.17101 0.7383 0.4603425   
## factor(CpordID)3817 6.88405 18.15406 0.3792 0.7045560   
## factor(CpordID)3818 -2.99019 18.13170 -0.1649 0.8690181   
## factor(CpordID)3821 14.08689 19.68451 0.7156 0.4742550   
## factor(CpordID)3822 10.89976 21.73450 0.5015 0.6160469   
## factor(CpordID)3824 2.21190 18.16365 0.1218 0.9030816   
## factor(CpordID)3829 17.80936 18.17101 0.9801 0.3270909   
## factor(CpordID)3835 13.63079 18.17101 0.7501 0.4532102   
## factor(CpordID)3839 24.54140 18.16026 1.3514 0.1766424   
## factor(CpordID)3842 9.49327 20.52912 0.4624 0.6437960   
## factor(CpordID)3843 6.74738 18.15296 0.3717 0.7101369   
## factor(CpordID)3848 -3.66168 23.38185 -0.1566 0.8755644   
## factor(CpordID)3852 3.03368 18.12855 0.1673 0.8671081   
## factor(CpordID)3854 24.17595 18.15296 1.3318 0.1829967   
## factor(CpordID)3857 21.36142 18.07418 1.1819 0.2373182   
## factor(CpordID)3861 40.76667 18.26970 2.2314 0.0257052 \*   
## factor(CpordID)3864 118.94849 18.20114 6.5352 7.062e-11 \*\*\*  
## factor(CpordID)3866 14.28310 18.15296 0.7868 0.4314295   
## factor(CpordID)3871 57.23130 21.29921 2.6870 0.0072360 \*\*   
## factor(CpordID)3873 293.53843 18.48858 15.8767 < 2.2e-16 \*\*\*  
## factor(CpordID)3875 62.97901 22.79455 2.7629 0.0057525 \*\*   
## factor(CpordID)3876 109.58185 20.89789 5.2437 1.647e-07 \*\*\*  
## factor(CpordID)3877 61.64880 19.80485 3.1128 0.0018648 \*\*   
## factor(CpordID)3878 34.97971 18.14681 1.9276 0.0539686 .   
## factor(CpordID)3880 161.41278 18.20114 8.8683 < 2.2e-16 \*\*\*  
## factor(CpordID)3881 96.49497 18.48858 5.2192 1.879e-07 \*\*\*  
## factor(CpordID)3885 34.39102 21.74300 1.5817 0.1137876   
## factor(CpordID)3886 63.51289 18.11725 3.5057 0.0004599 \*\*\*  
## factor(CpordID)3891 84.33278 20.89854 4.0353 5.543e-05 \*\*\*  
## factor(CpordID)3895 58.30380 18.15510 3.2114 0.0013301 \*\*   
## factor(CpordID)3904 117.89568 18.16540 6.4901 9.509e-11 \*\*\*  
## factor(CpordID)3905 164.45042 20.89854 7.8690 4.451e-15 \*\*\*  
## factor(CpordID)3915 106.13091 18.17447 5.8396 5.604e-09 \*\*\*  
## factor(CpordID)3916 96.14718 24.30808 3.9554 7.760e-05 \*\*\*  
## factor(CpordID)3919 -1.12423 18.50618 -0.0607 0.9515619   
## factor(CpordID)3925 102.78321 18.18784 5.6512 1.692e-08 \*\*\*  
## factor(CpordID)3926 117.53705 18.16426 6.4708 1.080e-10 \*\*\*  
## factor(CpordID)3929 47.55564 18.20114 2.6128 0.0090109 \*\*   
## factor(CpordID)3937 44.77665 19.63436 2.2805 0.0226234 \*   
## factor(CpordID)3938 275.69524 18.33014 15.0405 < 2.2e-16 \*\*\*  
## factor(CpordID)3942 108.42361 18.19112 5.9602 2.712e-09 \*\*\*  
## factor(CpordID)3944 20.35064 18.09738 1.1245 0.2608580   
## factor(CpordID)3949 100.20622 18.15715 5.5188 3.605e-08 \*\*\*  
## factor(CpordID)3954 72.43142 18.23070 3.9730 7.208e-05 \*\*\*  
## factor(CpordID)3955 67.52508 20.54293 3.2870 0.0010203 \*\*   
## factor(CpordID)3959 99.95579 22.24912 4.4926 7.214e-06 \*\*\*  
## factor(CpordID)3960 91.87706 18.20114 5.0479 4.645e-07 \*\*\*  
## factor(CpordID)3961 8.92378 18.25553 0.4888 0.6249888   
## factor(CpordID)3965 85.88224 18.25418 4.7048 2.618e-06 \*\*\*  
## factor(CpordID)3968 27.30564 18.20114 1.5002 0.1336292   
## factor(CpordID)3969 15.36779 18.17620 0.8455 0.3978828   
## factor(CpordID)3970 24.56212 18.15691 1.3528 0.1761976   
## factor(CpordID)3972 37.71574 18.26173 2.0653 0.0389532 \*   
## factor(CpordID)3973 21.91951 19.63436 1.1164 0.2643171   
## factor(CpordID)3974 37.98793 18.17101 2.0906 0.0366221 \*   
## factor(CpordID)3975 5.88463 18.14971 0.3242 0.7457810   
## factor(CpordID)3976 10.80570 18.14169 0.5956 0.5514539   
## factor(CpordID)3978 24.14852 18.08415 1.3353 0.1818325   
## factor(CpordID)3979 55.33172 18.14478 3.0495 0.0023060 \*\*   
## factor(CpordID)3981 4.62610 18.13290 0.2551 0.7986408   
## factor(CpordID)3982 48.76432 18.18522 2.6815 0.0073554 \*\*   
## factor(CpordID)3984 135.55948 18.17447 7.4588 1.043e-13 \*\*\*  
## factor(CpordID)3985 65.09892 18.14971 3.5868 0.0003384 \*\*\*  
## factor(CpordID)3986 45.84892 18.14971 2.5262 0.0115662 \*   
## factor(CpordID)3995 17.24730 20.54293 0.8396 0.4011925   
## factor(CpordID)4001 26.48509 18.14994 1.4592 0.1445696   
## factor(CpordID)4006 145.74417 18.19328 8.0109 1.441e-15 \*\*\*  
## factor(CpordID)4007 124.27377 18.17447 6.8378 9.125e-12 \*\*\*  
## factor(CpordID)4009 105.10071 18.10927 5.8037 6.935e-09 \*\*\*  
## factor(CpordID)4013 5.78406 20.52828 0.2818 0.7781403   
## factor(CpordID)4014 20.27691 18.11787 1.1192 0.2631292   
## factor(CpordID)4015 -6.23863 18.10830 -0.3445 0.7304729   
## factor(CpordID)4016 67.05936 18.17101 3.6905 0.0002265 \*\*\*  
## factor(CpordID)4017 17.48646 18.09258 0.9665 0.3338468   
## factor(CpordID)4019 28.20222 18.17101 1.5520 0.1207222   
## factor(CpordID)4028 18.57667 18.81315 0.9874 0.3234853   
## factor(CpordID)4031 151.63091 18.17447 8.3431 < 2.2e-16 \*\*\*  
## factor(CpordID)4032 34.30936 18.17101 1.8881 0.0590721 .   
## factor(CpordID)4037 42.22869 18.14370 2.3275 0.0199853 \*   
## factor(CpordID)4038 13.34755 18.25211 0.7313 0.4646417   
## factor(CpordID)4040 67.57281 18.14661 3.7237 0.0001987 \*\*\*  
## factor(CpordID)4042 37.48295 18.14392 2.0659 0.0388984 \*   
## factor(CpordID)4043 25.17481 18.17826 1.3849 0.1661567   
## factor(CpordID)4055 23.60457 18.15392 1.3002 0.1935834   
## factor(CpordID)4063 -9.66950 19.67233 -0.4915 0.6230771   
## factor(CpordID)4068 186.91663 18.17447 10.2846 < 2.2e-16 \*\*\*  
## factor(CpordID)4069 59.67215 18.17738 3.2828 0.0010358 \*\*   
## factor(CpordID)4074 79.55935 19.98558 3.9808 6.976e-05 \*\*\*  
## factor(CpordID)4084 174.90543 18.54247 9.4327 < 2.2e-16 \*\*\*  
## factor(CpordID)4088 226.41470 18.80236 12.0418 < 2.2e-16 \*\*\*  
## factor(CpordID)4089 17.62313 20.33933 0.8665 0.3862868   
## factor(CpordID)4118 278.71273 18.78477 14.8372 < 2.2e-16 \*\*\*  
## factor(CpordID)4134 37.72059 19.60367 1.9242 0.0543979 .   
## factor(CpordID)4136 16.30198 21.86986 0.7454 0.4560639   
## factor(CpordID)4137 38.72147 22.96208 1.6863 0.0918034 .   
## factor(CpordID)4140 37.95479 19.91445 1.9059 0.0567282 .   
## factor(CpordID)4142 30.10322 19.63568 1.5331 0.1253250   
## factor(CpordID)4143 36.36787 18.67583 1.9473 0.0515585 .   
## factor(CpordID)4144 58.57307 18.82065 3.1122 0.0018689 \*\*   
## factor(CpordID)4147 -4.96986 19.62361 -0.2533 0.8000795   
## factor(CpordID)4151 71.65430 27.41812 2.6134 0.0089949 \*\*   
## factor(CpordID)4153 46.88247 22.81541 2.0549 0.0399505 \*   
## factor(CpordID)4154 25.49695 19.89417 1.2816 0.2000393   
## factor(CpordID)4155 49.94908 18.63855 2.6799 0.0073918 \*\*   
## factor(CpordID)4156 188.04743 18.74841 10.0300 < 2.2e-16 \*\*\*  
## factor(CpordID)4160 16.18301 22.96208 0.7048 0.4809893   
## factor(CpordID)4162 9.91814 19.94587 0.4973 0.6190353   
## factor(CpordID)4163 21.25165 19.92439 1.0666 0.2862034   
## factor(CpordID)4164 107.01881 19.98019 5.3562 8.923e-08 \*\*\*  
## factor(CpordID)4170 14.04951 19.58104 0.7175 0.4730997   
## factor(CpordID)4178 59.14173 19.93329 2.9670 0.0030233 \*\*   
## factor(CpordID)4190 141.38316 18.99208 7.4443 1.162e-13 \*\*\*  
## factor(CpordID)4191 43.25362 19.64263 2.2020 0.0277142 \*   
## factor(CpordID)4198 38.15274 19.84068 1.9230 0.0545491 .   
## factor(CpordID)4206 142.11682 20.55807 6.9129 5.417e-12 \*\*\*  
## factor(CpordID)4212 137.15898 23.67130 5.7943 7.331e-09 \*\*\*  
## factor(CpordID)4251 269.79711 22.93791 11.7621 < 2.2e-16 \*\*\*  
## factor(Wk)2 -17.13204 7.56185 -2.2656 0.0235242 \*   
## factor(Wk)3 24.69825 7.51321 3.2873 0.0010193 \*\*   
## factor(Wk)4 36.24515 7.47700 4.8476 1.292e-06 \*\*\*  
## factor(Wk)5 12.73593 7.46163 1.7069 0.0879182 .   
## factor(Wk)6 28.23071 7.47150 3.7785 0.0001599 \*\*\*  
## factor(Wk)7 51.88459 7.43566 6.9778 3.438e-12 \*\*\*  
## factor(Wk)8 11.52206 7.40346 1.5563 0.1197059   
## factor(Wk)9 -11.30503 7.31407 -1.5457 0.1222584   
## factor(Wk)10 56.49617 7.28956 7.7503 1.127e-14 \*\*\*  
## factor(Wk)11 24.39983 7.34885 3.3202 0.0009067 \*\*\*  
## factor(Wk)12 -8.00804 7.36607 -1.0872 0.2770284   
## factor(Wk)13 -2.77464 8.17504 -0.3394 0.7343219   
## factor(Wk)14 9.70900 7.47503 1.2989 0.1940596   
## factor(Wk)15 -3.86965 7.47953 -0.5174 0.6049269   
## factor(Wk)16 -17.03144 7.49057 -2.2737 0.0230302 \*   
## factor(Wk)17 -27.36249 7.47643 -3.6598 0.0002553 \*\*\*  
## factor(Wk)18 9.79311 7.51140 1.3038 0.1923800   
## factor(Wk)19 -5.52644 7.60308 -0.7269 0.4673444   
## factor(Wk)20 -3.37362 7.65087 -0.4409 0.6592737   
## factor(Wk)21 -59.17018 8.35721 -7.0801 1.665e-12 \*\*\*  
## factor(Wk)22 -27.75890 7.84658 -3.5377 0.0004077 \*\*\*  
## factor(Wk)23 -4.78232 7.84823 -0.6094 0.5423230   
## factor(Wk)24 -18.72430 7.86098 -2.3819 0.0172638 \*   
## factor(Wk)25 -32.80477 7.86698 -4.1699 3.105e-05 \*\*\*  
## factor(Wk)26 -77.57989 8.97563 -8.6434 < 2.2e-16 \*\*\*  
## factor(Wk)27 -65.27491 9.12745 -7.1515 9.980e-13 \*\*\*  
## factor(Wk)28 -84.16597 9.06487 -9.2848 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 65211000  
## Residual Sum of Squares: 20437000  
## R-Squared: 0.6866  
## Adj. R-Squared: 0.6702  
## F-statistic: 41.8776 on 234 and 4473 DF, p-value: < 2.22e-16

model10 <- plm(CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk + FpHomePgWk + FpCatPgWk + CpPriceDiscWk +  
 CpEmailWk + CpCatalogWk + CpHomePgWk + CpCatPgWk + I(VidWk\*CpCatalogWk) + factor(CpordID) + factor(Wk),  
 data = cp\_sales, model = 'pooling', index = c('CpordID', "Wk"))  
summary(model10)

## Pooling Model  
##   
## Call:  
## plm(formula = CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk +   
## FpHomePgWk + FpCatPgWk + CpPriceDiscWk + CpEmailWk + CpCatalogWk +   
## CpHomePgWk + CpCatPgWk + I(VidWk \* CpCatalogWk) + factor(CpordID) +   
## factor(Wk), data = cp\_sales, model = "pooling", index = c("CpordID",   
## "Wk"))  
##   
## Unbalanced Panel: n = 196, T = 8-28, N = 4708  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -936.4551 -22.9281 -2.7708 18.0423 1343.2360   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 0.459203 13.904016 0.0330 0.9736548   
## VidWk 21.646511 4.228130 5.1196 3.190e-07 \*\*\*  
## FpPriceDiscWk -4.496320 4.997121 -0.8998 0.3682846   
## FpEmailWk -10.818491 17.279492 -0.6261 0.5312888   
## FpCatalogWk -9.020116 9.119380 -0.9891 0.3226604   
## FpHomePgWk 14.539400 6.196245 2.3465 0.0189948 \*   
## FpCatPgWk 6.594894 5.565982 1.1849 0.2361368   
## CpPriceDiscWk 88.994394 5.195076 17.1305 < 2.2e-16 \*\*\*  
## CpEmailWk 66.604190 20.222100 3.2936 0.0009967 \*\*\*  
## CpCatalogWk 127.975385 18.506444 6.9152 5.333e-12 \*\*\*  
## CpHomePgWk 65.123501 15.536073 4.1918 2.821e-05 \*\*\*  
## CpCatPgWk 50.797831 14.435860 3.5189 0.0004377 \*\*\*  
## I(VidWk \* CpCatalogWk) -111.514604 35.676379 -3.1257 0.0017850 \*\*   
## factor(CpordID)1661 33.310366 18.153826 1.8349 0.0665876 .   
## factor(CpordID)1973 9.594679 18.135353 0.5291 0.5967905   
## factor(CpordID)1974 -0.020275 18.184249 -0.0011 0.9991104   
## factor(CpordID)2143 202.164332 18.196102 11.1103 < 2.2e-16 \*\*\*  
## factor(CpordID)2357 -6.217166 18.122038 -0.3431 0.7315603   
## factor(CpordID)2518 -0.998451 19.612757 -0.0509 0.9594009   
## factor(CpordID)2532 88.804802 20.519416 4.3278 1.539e-05 \*\*\*  
## factor(CpordID)2592 34.666429 20.519364 1.6894 0.0912030 .   
## factor(CpordID)2679 3.867990 18.162451 0.2130 0.8313630   
## factor(CpordID)2690 4.082276 18.162451 0.2248 0.8221727   
## factor(CpordID)2716 108.830749 18.167513 5.9904 2.257e-09 \*\*\*  
## factor(CpordID)2757 131.094751 18.091719 7.2461 5.026e-13 \*\*\*  
## factor(CpordID)2758 240.178200 18.141771 13.2390 < 2.2e-16 \*\*\*  
## factor(CpordID)2759 85.008960 18.451104 4.6073 4.194e-06 \*\*\*  
## factor(CpordID)2763 151.636980 19.587648 7.7415 1.207e-14 \*\*\*  
## factor(CpordID)2841 6.667909 18.148404 0.3674 0.7133304   
## factor(CpordID)2863 14.582276 18.162451 0.8029 0.4220865   
## factor(CpordID)2881 -8.271506 22.776163 -0.3632 0.7164988   
## factor(CpordID)2885 -1.582091 18.148404 -0.0872 0.9305362   
## factor(CpordID)2909 0.346048 20.485779 0.0169 0.9865234   
## factor(CpordID)3025 9.296561 18.162451 0.5119 0.6087770   
## factor(CpordID)3042 27.689275 24.116346 1.1482 0.2509665   
## factor(CpordID)3123 26.858944 18.065732 1.4867 0.1371555   
## factor(CpordID)3124 1.742333 18.141217 0.0960 0.9234909   
## factor(CpordID)3164 130.205617 18.165686 7.1677 8.881e-13 \*\*\*  
## factor(CpordID)3205 17.927284 21.724132 0.8252 0.4092882   
## factor(CpordID)3207 3.541911 20.189964 0.1754 0.8607503   
## factor(CpordID)3209 5.910332 20.189964 0.2927 0.7697374   
## factor(CpordID)3251 87.713801 19.146628 4.5812 4.750e-06 \*\*\*  
## factor(CpordID)3253 126.938818 18.174707 6.9844 3.283e-12 \*\*\*  
## factor(CpordID)3309 983.412334 18.275414 53.8107 < 2.2e-16 \*\*\*  
## factor(CpordID)3317 44.759583 18.176425 2.4625 0.0138344 \*   
## factor(CpordID)3349 6.271873 19.888897 0.3153 0.7525141   
## factor(CpordID)3423 39.046561 18.162451 2.1499 0.0316205 \*   
## factor(CpordID)3435 67.545560 18.192338 3.7129 0.0002074 \*\*\*  
## factor(CpordID)3441 16.043072 19.656400 0.8162 0.4144432   
## factor(CpordID)3446 11.593929 18.154950 0.6386 0.5231095   
## factor(CpordID)3462 20.885453 18.144448 1.1511 0.2497667   
## factor(CpordID)3466 15.760847 18.162451 0.8678 0.3855663   
## factor(CpordID)3474 -1.382010 18.162451 -0.0761 0.9393496   
## factor(CpordID)3479 72.197854 19.441244 3.7136 0.0002068 \*\*\*  
## factor(CpordID)3483 7.546561 18.162451 0.4155 0.6777933   
## factor(CpordID)3484 56.138175 18.271018 3.0725 0.0021353 \*\*   
## factor(CpordID)3485 -16.604517 23.370419 -0.7105 0.4774356   
## factor(CpordID)3487 -11.394052 23.410347 -0.4867 0.6264876   
## factor(CpordID)3490 -12.921362 18.435562 -0.7009 0.4834061   
## factor(CpordID)3492 19.520722 19.606687 0.9956 0.3194908   
## factor(CpordID)3494 56.179374 20.442283 2.7482 0.0060165 \*\*   
## factor(CpordID)3496 44.770061 18.119008 2.4709 0.0135148 \*   
## factor(CpordID)3500 191.328541 18.245501 10.4863 < 2.2e-16 \*\*\*  
## factor(CpordID)3506 26.608956 18.085776 1.4713 0.1412900   
## factor(CpordID)3508 -1.062707 18.090954 -0.0587 0.9531599   
## factor(CpordID)3509 95.159888 24.192975 3.9334 8.503e-05 \*\*\*  
## factor(CpordID)3570 2.882340 22.776163 0.1266 0.8993017   
## factor(CpordID)3573 20.504249 18.136393 1.1306 0.2583017   
## factor(CpordID)3576 79.001172 18.135786 4.3561 1.354e-05 \*\*\*  
## factor(CpordID)3577 12.189418 18.162451 0.6711 0.5021705   
## factor(CpordID)3578 -4.717281 18.065903 -0.2611 0.7940158   
## factor(CpordID)3580 17.382458 18.162369 0.9571 0.3385892   
## factor(CpordID)3585 2.772614 23.410347 0.1184 0.9057280   
## factor(CpordID)3619 30.989874 21.289002 1.4557 0.1455526   
## factor(CpordID)3622 22.043120 18.103415 1.2176 0.2234318   
## factor(CpordID)3627 45.515791 18.227050 2.4972 0.0125551 \*   
## factor(CpordID)3628 62.835239 18.192714 3.4539 0.0005577 \*\*\*  
## factor(CpordID)3671 224.795560 18.192338 12.3566 < 2.2e-16 \*\*\*  
## factor(CpordID)3674 -17.690253 22.346222 -0.7916 0.4286103   
## factor(CpordID)3675 19.958832 22.783794 0.8760 0.3810716   
## factor(CpordID)3678 16.950071 18.184893 0.9321 0.3513371   
## factor(CpordID)3680 99.498106 19.685466 5.0544 4.490e-07 \*\*\*  
## factor(CpordID)3711 10.752438 20.189964 0.5326 0.5943622   
## factor(CpordID)3720 51.272614 23.410347 2.1902 0.0285634 \*   
## factor(CpordID)3721 4.475333 19.795103 0.2261 0.8211473   
## factor(CpordID)3729 67.509846 18.192338 3.7109 0.0002090 \*\*\*  
## factor(CpordID)3749 32.041423 20.189927 1.5870 0.1125832   
## factor(CpordID)3751 68.277046 18.165686 3.7586 0.0001731 \*\*\*  
## factor(CpordID)3765 32.455617 18.165686 1.7866 0.0740627 .   
## factor(CpordID)3812 -1.596296 18.162451 -0.0879 0.9299681   
## factor(CpordID)3815 16.093302 18.146430 0.8869 0.3752032   
## factor(CpordID)3816 13.653704 18.162451 0.7518 0.4522383   
## factor(CpordID)3817 6.946456 18.145155 0.3828 0.7018662   
## factor(CpordID)3818 3.066408 18.234825 0.1682 0.8664633   
## factor(CpordID)3821 14.586567 19.676099 0.7413 0.4585297   
## factor(CpordID)3822 11.127284 21.724132 0.5122 0.6085304   
## factor(CpordID)3824 2.379644 18.154950 0.1311 0.8957226   
## factor(CpordID)3829 18.046561 18.162451 0.9936 0.3204620   
## factor(CpordID)3835 13.867990 18.162451 0.7636 0.4451741   
## factor(CpordID)3839 24.669790 18.151477 1.3591 0.1741814   
## factor(CpordID)3842 9.721984 20.519364 0.4738 0.6356688   
## factor(CpordID)3843 6.992596 18.144448 0.3854 0.6999706   
## factor(CpordID)3848 -3.687850 23.370419 -0.1578 0.8746216   
## factor(CpordID)3852 3.227229 18.119768 0.1781 0.8586482   
## factor(CpordID)3854 24.421167 18.144448 1.3459 0.1783931   
## factor(CpordID)3857 21.431649 18.065352 1.1863 0.2355511   
## factor(CpordID)3861 40.542907 18.261028 2.2202 0.0264560 \*   
## factor(CpordID)3864 119.081275 18.192338 6.5457 6.589e-11 \*\*\*  
## factor(CpordID)3866 14.528310 18.144448 0.8007 0.4233463   
## factor(CpordID)3871 57.427374 21.289002 2.6975 0.0070121 \*\*   
## factor(CpordID)3873 293.248001 18.480029 15.8684 < 2.2e-16 \*\*\*  
## factor(CpordID)3875 63.266524 22.783794 2.7768 0.0055122 \*\*   
## factor(CpordID)3876 109.789692 20.887910 5.2561 1.540e-07 \*\*\*  
## factor(CpordID)3877 61.507613 19.795070 3.1072 0.0019004 \*\*   
## factor(CpordID)3878 34.682232 18.138259 1.9121 0.0559267 .   
## factor(CpordID)3880 161.545560 18.192338 8.8799 < 2.2e-16 \*\*\*  
## factor(CpordID)3881 96.623586 18.478710 5.2289 1.783e-07 \*\*\*  
## factor(CpordID)3885 34.379371 21.732240 1.5820 0.1137311   
## factor(CpordID)3886 63.258101 18.108474 3.4933 0.0004817 \*\*\*  
## factor(CpordID)3891 84.530568 20.888539 4.0467 5.281e-05 \*\*\*  
## factor(CpordID)3895 58.509921 18.146492 3.2243 0.0012718 \*\*   
## factor(CpordID)3904 118.284667 18.157095 6.5145 8.097e-11 \*\*\*  
## factor(CpordID)3905 164.648215 20.888539 7.8822 4.010e-15 \*\*\*  
## factor(CpordID)3915 106.277046 18.165686 5.8504 5.253e-09 \*\*\*  
## factor(CpordID)3916 91.988514 24.331001 3.7807 0.0001584 \*\*\*  
## factor(CpordID)3919 -1.190595 18.497069 -0.0644 0.9486811   
## factor(CpordID)3925 102.863179 18.178882 5.6584 1.623e-08 \*\*\*  
## factor(CpordID)3926 117.630379 18.155303 6.4791 1.022e-10 \*\*\*  
## factor(CpordID)3929 47.688417 18.192338 2.6213 0.0087880 \*\*   
## factor(CpordID)3937 44.953396 19.624939 2.2906 0.0220314 \*   
## factor(CpordID)3938 277.001821 18.298350 15.1381 < 2.2e-16 \*\*\*  
## factor(CpordID)3942 108.528483 18.182222 5.9689 2.573e-09 \*\*\*  
## factor(CpordID)3944 20.329063 18.088528 1.1239 0.2611306   
## factor(CpordID)3949 99.891069 18.148008 5.5042 3.915e-08 \*\*\*  
## factor(CpordID)3954 72.305376 18.220906 3.9683 7.353e-05 \*\*\*  
## factor(CpordID)3955 68.038255 20.533372 3.3135 0.0009285 \*\*\*  
## factor(CpordID)3959 100.178549 22.238489 4.5047 6.815e-06 \*\*\*  
## factor(CpordID)3960 92.009846 18.192338 5.0576 4.415e-07 \*\*\*  
## factor(CpordID)3961 8.875576 18.246610 0.4864 0.6266909   
## factor(CpordID)3965 86.986667 18.243883 4.7680 1.920e-06 \*\*\*  
## factor(CpordID)3968 27.438417 18.192338 1.5082 0.1315637   
## factor(CpordID)3969 15.397050 18.167188 0.8475 0.3967509   
## factor(CpordID)3970 24.810767 18.148404 1.3671 0.1716612   
## factor(CpordID)3972 36.583486 18.254155 2.0041 0.0451176 \*   
## factor(CpordID)3973 22.096253 19.624939 1.1259 0.2602567   
## factor(CpordID)3974 38.225133 18.162451 2.1046 0.0353797 \*   
## factor(CpordID)3975 6.135190 18.141217 0.3382 0.7352354   
## factor(CpordID)3976 10.949008 18.132941 0.6038 0.5459948   
## factor(CpordID)3978 24.182823 18.075314 1.3379 0.1809996   
## factor(CpordID)3979 55.544497 18.136193 3.0626 0.0022070 \*\*   
## factor(CpordID)3981 1.898733 18.084657 0.1050 0.9163874   
## factor(CpordID)3982 48.902440 18.176425 2.6904 0.0071625 \*\*   
## factor(CpordID)3984 135.705617 18.165686 7.4704 9.558e-14 \*\*\*  
## factor(CpordID)3985 65.349476 18.141217 3.6023 0.0003189 \*\*\*  
## factor(CpordID)3986 46.099476 18.141217 2.5411 0.0110825 \*   
## factor(CpordID)3995 17.760478 20.533372 0.8650 0.3871089   
## factor(CpordID)4001 26.739075 18.141452 1.4739 0.1405731   
## factor(CpordID)4006 145.920815 18.184557 8.0244 1.292e-15 \*\*\*  
## factor(CpordID)4007 124.419903 18.165686 6.8492 8.436e-12 \*\*\*  
## factor(CpordID)4009 105.024496 18.100388 5.8023 6.991e-09 \*\*\*  
## factor(CpordID)4013 6.022268 20.518552 0.2935 0.7691509   
## factor(CpordID)4014 20.316170 18.109013 1.1219 0.2619730   
## factor(CpordID)4015 -3.910666 18.116443 -0.2159 0.8291045   
## factor(CpordID)4016 67.296561 18.162451 3.7053 0.0002137 \*\*\*  
## factor(CpordID)4017 17.542575 18.083726 0.9701 0.3320614   
## factor(CpordID)4019 28.439418 18.162451 1.5658 0.1174578   
## factor(CpordID)4028 18.593698 18.803937 0.9888 0.3228050   
## factor(CpordID)4031 151.777046 18.165686 8.3552 < 2.2e-16 \*\*\*  
## factor(CpordID)4032 34.546561 18.162451 1.9021 0.0572240 .   
## factor(CpordID)4037 39.539871 18.095830 2.1850 0.0289386 \*   
## factor(CpordID)4038 13.131799 18.243441 0.7198 0.4716800   
## factor(CpordID)4040 67.265675 18.137401 3.7087 0.0002109 \*\*\*  
## factor(CpordID)4042 37.701822 18.135353 2.0789 0.0376822 \*   
## factor(CpordID)4043 25.295184 18.169461 1.3922 0.1639367   
## factor(CpordID)4055 23.813361 18.145318 1.3124 0.1894628   
## factor(CpordID)4063 -9.235028 19.663413 -0.4697 0.6386241   
## factor(CpordID)4068 187.062760 18.165686 10.2976 < 2.2e-16 \*\*\*  
## factor(CpordID)4069 59.867589 18.168728 3.2951 0.0009916 \*\*\*  
## factor(CpordID)4074 79.640814 19.975789 3.9869 6.802e-05 \*\*\*  
## factor(CpordID)4084 175.017662 18.533413 9.4434 < 2.2e-16 \*\*\*  
## factor(CpordID)4088 226.531762 18.793220 12.0539 < 2.2e-16 \*\*\*  
## factor(CpordID)4089 17.762059 20.329422 0.8737 0.3823220   
## factor(CpordID)4118 276.720930 18.781373 14.7338 < 2.2e-16 \*\*\*  
## factor(CpordID)4134 35.316358 19.606321 1.8013 0.0717270 .   
## factor(CpordID)4136 18.810192 21.846541 0.8610 0.3892761   
## factor(CpordID)4137 39.076906 22.951461 1.7026 0.0887145 .   
## factor(CpordID)4140 38.240204 19.905104 1.9211 0.0547794 .   
## factor(CpordID)4142 30.398175 19.626512 1.5488 0.1214928   
## factor(CpordID)4143 34.313978 18.674673 1.8375 0.0662082 .   
## factor(CpordID)4144 60.123287 18.800068 3.1980 0.0013933 \*\*   
## factor(CpordID)4147 -5.045916 19.613925 -0.2573 0.7969884   
## factor(CpordID)4151 76.100955 27.362645 2.7812 0.0054385 \*\*   
## factor(CpordID)4153 47.191955 22.804679 2.0694 0.0385661 \*   
## factor(CpordID)4154 25.789836 19.884877 1.2970 0.1947128   
## factor(CpordID)4155 49.815642 18.629413 2.6740 0.0075218 \*\*   
## factor(CpordID)4156 188.338490 18.739546 10.0503 < 2.2e-16 \*\*\*  
## factor(CpordID)4160 16.538445 22.951461 0.7206 0.4712034   
## factor(CpordID)4162 6.193471 19.864404 0.3118 0.7552166   
## factor(CpordID)4163 20.900523 19.915316 1.0495 0.2940187   
## factor(CpordID)4164 104.692666 19.979760 5.2399 1.680e-07 \*\*\*  
## factor(CpordID)4170 14.014750 19.571466 0.7161 0.4739789   
## factor(CpordID)4178 59.288435 19.923647 2.9758 0.0029381 \*\*   
## factor(CpordID)4190 140.406724 18.987521 7.3947 1.683e-13 \*\*\*  
## factor(CpordID)4191 43.492879 19.633345 2.2153 0.0267927 \*   
## factor(CpordID)4198 38.184623 19.830889 1.9255 0.0542286 .   
## factor(CpordID)4206 142.243289 20.548050 6.9225 5.068e-12 \*\*\*  
## factor(CpordID)4212 137.690143 23.660908 5.8193 6.322e-09 \*\*\*  
## factor(CpordID)4251 273.842676 22.879764 11.9688 < 2.2e-16 \*\*\*  
## factor(Wk)2 -17.256698 7.558255 -2.2832 0.0224677 \*   
## factor(Wk)3 24.537191 7.509467 3.2675 0.0010932 \*\*   
## factor(Wk)4 35.989786 7.473203 4.8158 1.514e-06 \*\*\*  
## factor(Wk)5 12.564223 7.458199 1.6846 0.0921319 .   
## factor(Wk)6 28.405293 7.468193 3.8035 0.0001446 \*\*\*  
## factor(Wk)7 51.603746 7.432322 6.9432 4.385e-12 \*\*\*  
## factor(Wk)8 10.983202 7.402245 1.4838 0.1379414   
## factor(Wk)9 -12.042797 7.312989 -1.6468 0.0996760 .   
## factor(Wk)10 56.245946 7.286227 7.7195 1.431e-14 \*\*\*  
## factor(Wk)11 23.690345 7.349872 3.2232 0.0012766 \*\*   
## factor(Wk)12 -8.502044 7.365803 -1.1543 0.2484557   
## factor(Wk)13 -3.652646 8.162765 -0.4475 0.6545527   
## factor(Wk)14 10.120737 7.472782 1.3543 0.1756942   
## factor(Wk)15 -3.477985 7.477242 -0.4651 0.6418519   
## factor(Wk)16 -17.393529 7.487665 -2.3230 0.0202261 \*   
## factor(Wk)17 -27.640881 7.472938 -3.6988 0.0002192 \*\*\*  
## factor(Wk)18 9.570351 7.507942 1.2747 0.2024827   
## factor(Wk)19 -5.759805 7.599694 -0.7579 0.4485510   
## factor(Wk)20 -3.600337 7.647436 -0.4708 0.6378136   
## factor(Wk)21 -59.048680 8.352879 -7.0693 1.799e-12 \*\*\*  
## factor(Wk)22 -27.926799 7.842805 -3.5608 0.0003735 \*\*\*  
## factor(Wk)23 -4.732246 7.844302 -0.6033 0.5463585   
## factor(Wk)24 -19.164280 7.857758 -2.4389 0.0147707 \*   
## factor(Wk)25 -33.211959 7.863646 -4.2235 2.453e-05 \*\*\*  
## factor(Wk)26 -77.525194 8.971259 -8.6415 < 2.2e-16 \*\*\*  
## factor(Wk)27 -65.120446 9.123046 -7.1380 1.100e-12 \*\*\*  
## factor(Wk)28 -83.787857 9.060420 -9.2477 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 65211000  
## Residual Sum of Squares: 20417000  
## R-Squared: 0.6869  
## Adj. R-Squared: 0.67052  
## F-statistic: 41.9372 on 234 and 4473 DF, p-value: < 2.22e-16

model11 <- plm(CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk + FpHomePgWk + FpCatPgWk + CpPriceDiscWk +  
 CpEmailWk + CpCatalogWk + CpHomePgWk + CpCatPgWk + I(VidWk\*CpHomePgWk) + factor(CpordID) + factor(Wk),  
 data = cp\_sales, model = 'pooling', index = c('CpordID', "Wk"))  
summary(model11)

## Pooling Model  
##   
## Call:  
## plm(formula = CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk +   
## FpHomePgWk + FpCatPgWk + CpPriceDiscWk + CpEmailWk + CpCatalogWk +   
## CpHomePgWk + CpCatPgWk + I(VidWk \* CpHomePgWk) + factor(CpordID) +   
## factor(Wk), data = cp\_sales, model = "pooling", index = c("CpordID",   
## "Wk"))  
##   
## Unbalanced Panel: n = 196, T = 8-28, N = 4708  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -936.9016 -22.9225 -2.7787 17.9599 1343.0502   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 0.19030 13.90824 0.0137 0.9890840   
## VidWk 21.32160 4.22378 5.0480 4.642e-07 \*\*\*  
## FpPriceDiscWk -4.05607 4.99760 -0.8116 0.4170623   
## FpEmailWk -7.63787 17.23017 -0.4433 0.6575814   
## FpCatalogWk -9.99408 9.12299 -1.0955 0.2733640   
## FpHomePgWk 13.29515 6.19022 2.1478 0.0317859 \*   
## FpCatPgWk 6.86291 5.56624 1.2330 0.2176587   
## CpPriceDiscWk 89.32065 5.19602 17.1902 < 2.2e-16 \*\*\*  
## CpEmailWk 66.13647 20.24562 3.2667 0.0010963 \*\*   
## CpCatalogWk 104.69794 16.82027 6.2245 5.273e-10 \*\*\*  
## CpHomePgWk 88.88346 17.84073 4.9821 6.529e-07 \*\*\*  
## CpCatPgWk 50.59137 14.43967 3.5036 0.0004634 \*\*\*  
## I(VidWk \* CpHomePgWk) -100.22425 36.14653 -2.7727 0.0055820 \*\*   
## factor(CpordID)1661 33.16432 18.15781 1.8264 0.0678491 .   
## factor(CpordID)1973 9.42260 18.13927 0.5195 0.6034666   
## factor(CpordID)1974 0.13812 18.18822 0.0076 0.9939412   
## factor(CpordID)2143 201.85419 18.19954 11.0912 < 2.2e-16 \*\*\*  
## factor(CpordID)2357 -6.19487 18.12624 -0.3418 0.7325459   
## factor(CpordID)2518 -1.15515 19.61707 -0.0589 0.9530465   
## factor(CpordID)2532 88.63571 20.52393 4.3187 1.604e-05 \*\*\*  
## factor(CpordID)2592 34.50367 20.52389 1.6811 0.0928043 .   
## factor(CpordID)2679 3.73966 18.16648 0.2059 0.8369135   
## factor(CpordID)2690 3.95395 18.16648 0.2177 0.8277112   
## factor(CpordID)2716 108.69779 18.17153 5.9818 2.380e-09 \*\*\*  
## factor(CpordID)2757 131.10515 18.09592 7.2450 5.067e-13 \*\*\*  
## factor(CpordID)2758 240.23561 18.14601 13.2390 < 2.2e-16 \*\*\*  
## factor(CpordID)2759 84.99432 18.45551 4.6054 4.232e-06 \*\*\*  
## factor(CpordID)2763 151.49287 19.59228 7.7323 1.296e-14 \*\*\*  
## factor(CpordID)2841 6.49856 18.15233 0.3580 0.7203590   
## factor(CpordID)2863 14.45395 18.16648 0.7956 0.4262845   
## factor(CpordID)2881 -8.55760 22.78100 -0.3756 0.7071976   
## factor(CpordID)2885 -1.75144 18.15233 -0.0965 0.9231392   
## factor(CpordID)2909 0.35001 20.49057 0.0171 0.9863723   
## factor(CpordID)3025 9.16823 18.16648 0.5047 0.6138094   
## factor(CpordID)3042 27.46562 24.12170 1.1386 0.2549197   
## factor(CpordID)3123 26.86168 18.06993 1.4865 0.1372068   
## factor(CpordID)3124 1.53539 18.14505 0.0846 0.9325693   
## factor(CpordID)3164 130.05693 18.16966 7.1579 9.529e-13 \*\*\*  
## factor(CpordID)3205 17.75944 21.72895 0.8173 0.4137910   
## factor(CpordID)3207 3.38178 20.19442 0.1675 0.8670149   
## factor(CpordID)3209 5.75020 20.19442 0.2847 0.7758550   
## factor(CpordID)3251 87.59100 19.15090 4.5737 4.921e-06 \*\*\*  
## factor(CpordID)3253 126.84544 18.17882 6.9777 3.442e-12 \*\*\*  
## factor(CpordID)3309 983.77074 18.27973 53.8176 < 2.2e-16 \*\*\*  
## factor(CpordID)3317 44.65807 18.18052 2.4564 0.0140726 \*   
## factor(CpordID)3349 6.11463 19.89328 0.3074 0.7585750   
## factor(CpordID)3423 38.91823 18.16648 2.1423 0.0322223 \*   
## factor(CpordID)3435 67.47549 18.19650 3.7082 0.0002113 \*\*\*  
## factor(CpordID)3441 15.68493 19.66025 0.7978 0.4250292   
## factor(CpordID)3446 11.54490 18.15915 0.6358 0.5249639   
## factor(CpordID)3462 20.70995 18.14836 1.1411 0.2538696   
## factor(CpordID)3466 15.63252 18.16648 0.8605 0.3895516   
## factor(CpordID)3474 -1.51034 18.16648 -0.0831 0.9337449   
## factor(CpordID)3479 74.23800 19.43756 3.8193 0.0001356 \*\*\*  
## factor(CpordID)3483 7.41823 18.16648 0.4083 0.6830382   
## factor(CpordID)3484 50.27620 18.18261 2.7651 0.0057144 \*\*   
## factor(CpordID)3485 -16.70826 23.37594 -0.7148 0.4747926   
## factor(CpordID)3487 -11.68733 23.41533 -0.4991 0.6177112   
## factor(CpordID)3490 -12.86229 18.43981 -0.6975 0.4855086   
## factor(CpordID)3492 19.47167 19.61122 0.9929 0.3208203   
## factor(CpordID)3494 56.14613 20.44704 2.7459 0.0060581 \*\*   
## factor(CpordID)3496 44.84742 18.12328 2.4746 0.0133763 \*   
## factor(CpordID)3500 197.05666 18.34380 10.7424 < 2.2e-16 \*\*\*  
## factor(CpordID)3506 26.57834 18.08997 1.4692 0.1418406   
## factor(CpordID)3508 -0.90271 18.09513 -0.0499 0.9602148   
## factor(CpordID)3509 95.26645 24.19879 3.9368 8.382e-05 \*\*\*  
## factor(CpordID)3570 2.59625 22.78100 0.1140 0.9092703   
## factor(CpordID)3573 20.40805 18.14049 1.1250 0.2606492   
## factor(CpordID)3576 78.96240 18.14000 4.3529 1.373e-05 \*\*\*  
## factor(CpordID)3577 12.06109 18.16648 0.6639 0.5067757   
## factor(CpordID)3578 -4.67968 18.07010 -0.2590 0.7956674   
## factor(CpordID)3580 17.24456 18.16637 0.9493 0.3425411   
## factor(CpordID)3585 2.47934 23.41533 0.1059 0.9156781   
## factor(CpordID)3619 30.82383 21.29372 1.4476 0.1478116   
## factor(CpordID)3622 22.23528 18.10742 1.2280 0.2195247   
## factor(CpordID)3627 46.03516 18.23017 2.5252 0.0115969 \*   
## factor(CpordID)3628 63.08729 18.19650 3.4670 0.0005313 \*\*\*  
## factor(CpordID)3671 224.72549 18.19650 12.3499 < 2.2e-16 \*\*\*  
## factor(CpordID)3674 -17.24367 22.35090 -0.7715 0.4404528   
## factor(CpordID)3675 19.69783 22.78868 0.8644 0.3874314   
## factor(CpordID)3678 16.95930 18.18922 0.9324 0.3511895   
## factor(CpordID)3680 99.21300 19.68933 5.0389 4.866e-07 \*\*\*  
## factor(CpordID)3711 10.59230 20.19442 0.5245 0.5999454   
## factor(CpordID)3720 50.97934 23.41533 2.1772 0.0295194 \*   
## factor(CpordID)3721 4.44594 19.79979 0.2245 0.8223437   
## factor(CpordID)3729 67.43978 18.19650 3.7062 0.0002129 \*\*\*  
## factor(CpordID)3749 31.87529 20.19437 1.5784 0.1145388   
## factor(CpordID)3751 68.12836 18.16966 3.7496 0.0001794 \*\*\*  
## factor(CpordID)3765 32.30693 18.16966 1.7781 0.0754603 .   
## factor(CpordID)3812 -1.72463 18.16648 -0.0949 0.9243711   
## factor(CpordID)3815 16.07967 18.15071 0.8859 0.3757204   
## factor(CpordID)3816 13.52537 18.16648 0.7445 0.4565987   
## factor(CpordID)3817 6.98357 18.14952 0.3848 0.7004187   
## factor(CpordID)3818 -3.07924 18.12681 -0.1699 0.8651182   
## factor(CpordID)3821 14.08973 19.67935 0.7160 0.4740500   
## factor(CpordID)3822 10.95944 21.72895 0.5044 0.6140261   
## factor(CpordID)3824 2.33062 18.15915 0.1283 0.8978826   
## factor(CpordID)3829 17.91823 18.16648 0.9863 0.3240221   
## factor(CpordID)3835 13.73966 18.16648 0.7563 0.4494975   
## factor(CpordID)3839 24.65273 18.15575 1.3578 0.1745806   
## factor(CpordID)3842 9.55922 20.52389 0.4658 0.6414094   
## factor(CpordID)3843 6.81710 18.14836 0.3756 0.7072086   
## factor(CpordID)3848 -3.79160 23.37594 -0.1622 0.8711550   
## factor(CpordID)3852 3.14439 18.12392 0.1735 0.8622710   
## factor(CpordID)3854 24.24567 18.14836 1.3360 0.1816269   
## factor(CpordID)3857 21.37422 18.06954 1.1829 0.2369170   
## factor(CpordID)3861 40.73949 18.26482 2.2305 0.0257644 \*   
## factor(CpordID)3864 119.01120 18.19650 6.5403 6.827e-11 \*\*\*  
## factor(CpordID)3866 14.35281 18.14836 0.7909 0.4290676   
## factor(CpordID)3871 57.26133 21.29372 2.6891 0.0071907 \*\*   
## factor(CpordID)3873 293.53391 18.48376 15.8806 < 2.2e-16 \*\*\*  
## factor(CpordID)3875 63.00553 22.78868 2.7648 0.0057196 \*\*   
## factor(CpordID)3876 109.62670 20.89253 5.2472 1.616e-07 \*\*\*  
## factor(CpordID)3877 61.48086 19.79967 3.1051 0.0019138 \*\*   
## factor(CpordID)3878 34.93658 18.14217 1.9257 0.0542037 .   
## factor(CpordID)3880 161.47549 18.19650 8.8740 < 2.2e-16 \*\*\*  
## factor(CpordID)3881 96.64777 18.48304 5.2290 1.782e-07 \*\*\*  
## factor(CpordID)3885 34.46425 21.73747 1.5855 0.1129287   
## factor(CpordID)3886 63.51598 18.11260 3.5067 0.0004581 \*\*\*  
## factor(CpordID)3891 84.38334 20.89319 4.0388 5.463e-05 \*\*\*  
## factor(CpordID)3895 58.34200 18.15042 3.2144 0.0013166 \*\*   
## factor(CpordID)3904 118.12005 18.16103 6.5040 8.677e-11 \*\*\*  
## factor(CpordID)3905 164.50099 20.89319 7.8734 4.298e-15 \*\*\*  
## factor(CpordID)3915 106.12836 18.16966 5.8410 5.558e-09 \*\*\*  
## factor(CpordID)3916 96.19298 24.30185 3.9583 7.667e-05 \*\*\*  
## factor(CpordID)3919 -1.18336 18.50144 -0.0640 0.9490047   
## factor(CpordID)3925 101.90958 18.18380 5.6044 2.215e-08 \*\*\*  
## factor(CpordID)3926 116.59817 18.16019 6.4205 1.499e-10 \*\*\*  
## factor(CpordID)3929 47.61835 18.19650 2.6169 0.0089032 \*\*   
## factor(CpordID)3937 44.82777 19.62933 2.2837 0.0224350 \*   
## factor(CpordID)3938 278.60054 18.30182 15.2226 < 2.2e-16 \*\*\*  
## factor(CpordID)3942 108.44937 18.18636 5.9632 2.664e-09 \*\*\*  
## factor(CpordID)3944 20.38980 18.09274 1.1270 0.2598196   
## factor(CpordID)3949 105.44850 18.25944 5.7750 8.216e-09 \*\*\*  
## factor(CpordID)3954 70.52912 18.23174 3.8685 0.0001111 \*\*\*  
## factor(CpordID)3955 67.88063 20.53791 3.3051 0.0009568 \*\*\*  
## factor(CpordID)3959 99.95765 22.24335 4.4938 7.172e-06 \*\*\*  
## factor(CpordID)3960 91.93978 18.19650 5.0526 4.532e-07 \*\*\*  
## factor(CpordID)3961 8.94292 18.25084 0.4900 0.6241577   
## factor(CpordID)3965 85.24353 18.25321 4.6701 3.099e-06 \*\*\*  
## factor(CpordID)3968 27.36835 18.19650 1.5040 0.1326405   
## factor(CpordID)3969 17.18277 18.18676 0.9448 0.3448145   
## factor(CpordID)3970 24.64142 18.15233 1.3575 0.1746972   
## factor(CpordID)3972 37.79945 18.25710 2.0704 0.0384724 \*   
## factor(CpordID)3973 21.97063 19.62933 1.1193 0.2630826   
## factor(CpordID)3974 38.09680 18.16648 2.0971 0.0360413 \*   
## factor(CpordID)3975 5.92824 18.14505 0.3267 0.7438994   
## factor(CpordID)3976 10.86580 18.13706 0.5991 0.5491406   
## factor(CpordID)3978 24.16352 18.07951 1.3365 0.1814493   
## factor(CpordID)3979 55.38199 18.14013 3.0530 0.0022789 \*\*   
## factor(CpordID)3981 2.02399 18.08896 0.1119 0.9109149   
## factor(CpordID)3982 48.80092 18.18052 2.6842 0.0072962 \*\*   
## factor(CpordID)3984 135.55693 18.16966 7.4606 1.029e-13 \*\*\*  
## factor(CpordID)3985 65.14253 18.14505 3.5901 0.0003341 \*\*\*  
## factor(CpordID)3986 45.89253 18.14505 2.5292 0.0114662 \*   
## factor(CpordID)3995 17.60286 20.53791 0.8571 0.3914406   
## factor(CpordID)4001 26.53828 18.14529 1.4625 0.1436626   
## factor(CpordID)4006 145.72427 18.18840 8.0119 1.429e-15 \*\*\*  
## factor(CpordID)4007 124.27122 18.16966 6.8395 9.020e-12 \*\*\*  
## factor(CpordID)4009 105.07302 18.10460 5.8037 6.936e-09 \*\*\*  
## factor(CpordID)4013 5.84462 20.52305 0.2848 0.7758234   
## factor(CpordID)4014 20.34676 18.11323 1.1233 0.2613663   
## factor(CpordID)4015 -6.36356 18.10356 -0.3515 0.7252235   
## factor(CpordID)4016 67.16823 18.16648 3.6974 0.0002205 \*\*\*  
## factor(CpordID)4017 17.54189 18.08793 0.9698 0.3321927   
## factor(CpordID)4019 28.31109 18.16648 1.5584 0.1192033   
## factor(CpordID)4028 18.57496 18.80832 0.9876 0.3234055   
## factor(CpordID)4031 151.62836 18.16966 8.3451 < 2.2e-16 \*\*\*  
## factor(CpordID)4032 34.41823 18.16648 1.8946 0.0582097 .   
## factor(CpordID)4037 39.64256 18.10013 2.1902 0.0285625 \*   
## factor(CpordID)4038 13.28121 18.24739 0.7278 0.4667487   
## factor(CpordID)4040 65.61706 18.15190 3.6149 0.0003038 \*\*\*  
## factor(CpordID)4042 37.52974 18.13927 2.0690 0.0386055 \*   
## factor(CpordID)4043 25.32530 18.17384 1.3935 0.1635370   
## factor(CpordID)4055 23.62972 18.14921 1.3020 0.1929937   
## factor(CpordID)4063 -9.54240 19.66740 -0.4852 0.6275662   
## factor(CpordID)4068 186.91407 18.16966 10.2872 < 2.2e-16 \*\*\*  
## factor(CpordID)4069 59.76256 18.17281 3.2886 0.0010148 \*\*   
## factor(CpordID)4074 79.66700 19.98058 3.9872 6.792e-05 \*\*\*  
## factor(CpordID)4084 174.91570 18.53759 9.4357 < 2.2e-16 \*\*\*  
## factor(CpordID)4088 224.53575 18.80629 11.9394 < 2.2e-16 \*\*\*  
## factor(CpordID)4089 14.89834 20.35128 0.7321 0.4641709   
## factor(CpordID)4118 278.56829 18.77932 14.8338 < 2.2e-16 \*\*\*  
## factor(CpordID)4134 37.53076 19.59841 1.9150 0.0555575 .   
## factor(CpordID)4136 18.38478 21.85068 0.8414 0.4001787   
## factor(CpordID)4137 38.56036 22.95582 1.6798 0.0930730 .   
## factor(CpordID)4140 38.08743 19.90950 1.9130 0.0558082 .   
## factor(CpordID)4142 30.18409 19.63072 1.5376 0.1242184   
## factor(CpordID)4143 36.14732 18.67061 1.9361 0.0529239 .   
## factor(CpordID)4144 60.35962 18.80468 3.2098 0.0013376 \*\*   
## factor(CpordID)4147 -7.41656 19.63594 -0.3777 0.7056688   
## factor(CpordID)4151 76.00160 27.36899 2.7769 0.0055105 \*\*   
## factor(CpordID)4153 46.88061 22.80951 2.0553 0.0399070 \*   
## factor(CpordID)4154 25.59304 19.88917 1.2868 0.1982366   
## factor(CpordID)4155 49.92562 18.63374 2.6793 0.0074044 \*\*   
## factor(CpordID)4156 188.34282 18.74400 10.0482 < 2.2e-16 \*\*\*  
## factor(CpordID)4160 16.02189 22.95582 0.6979 0.4852479   
## factor(CpordID)4162 6.33160 19.86929 0.3187 0.7499973   
## factor(CpordID)4163 21.25554 19.91914 1.0671 0.2859882   
## factor(CpordID)4164 106.86764 19.97461 5.3502 9.226e-08 \*\*\*  
## factor(CpordID)4170 14.15124 19.57607 0.7229 0.4697885   
## factor(CpordID)4178 59.17320 19.92812 2.9693 0.0030003 \*\*   
## factor(CpordID)4190 141.31988 18.98704 7.4430 1.174e-13 \*\*\*  
## factor(CpordID)4191 43.30987 19.63762 2.2055 0.0274729 \*   
## factor(CpordID)4198 38.21055 19.83549 1.9264 0.0541211 .   
## factor(CpordID)4206 142.12739 20.55267 6.9153 5.329e-12 \*\*\*  
## factor(CpordID)4212 137.37132 23.66561 5.8047 6.895e-09 \*\*\*  
## factor(CpordID)4251 274.00917 22.88596 11.9728 < 2.2e-16 \*\*\*  
## factor(Wk)2 -17.15469 7.55991 -2.2692 0.0233057 \*   
## factor(Wk)3 24.88508 7.51185 3.3128 0.0009311 \*\*\*  
## factor(Wk)4 36.26147 7.47505 4.8510 1.270e-06 \*\*\*  
## factor(Wk)5 12.97711 7.46019 1.7395 0.0820131 .   
## factor(Wk)6 28.10709 7.46954 3.7629 0.0001701 \*\*\*  
## factor(Wk)7 51.74730 7.43376 6.9611 3.866e-12 \*\*\*  
## factor(Wk)8 12.69236 7.41245 1.7123 0.0869101 .   
## factor(Wk)9 -10.38699 7.32157 -1.4187 0.1560608   
## factor(Wk)10 56.66717 7.28810 7.7753 9.278e-15 \*\*\*  
## factor(Wk)11 24.66738 7.34697 3.3575 0.0007931 \*\*\*  
## factor(Wk)12 -7.49891 7.36315 -1.0184 0.3085250   
## factor(Wk)13 -3.51008 8.16477 -0.4299 0.6672848   
## factor(Wk)14 9.78949 7.47322 1.3099 0.1902825   
## factor(Wk)15 -3.81042 7.47769 -0.5096 0.6103761   
## factor(Wk)16 -16.65937 7.49003 -2.2242 0.0261842 \*   
## factor(Wk)17 -27.52579 7.47447 -3.6826 0.0002336 \*\*\*  
## factor(Wk)18 9.93976 7.50975 1.3236 0.1857097   
## factor(Wk)19 -5.37802 7.60135 -0.7075 0.4792875   
## factor(Wk)20 -3.22907 7.64911 -0.4222 0.6729355   
## factor(Wk)21 -58.96030 8.35484 -7.0570 1.963e-12 \*\*\*  
## factor(Wk)22 -27.58296 7.84496 -3.5160 0.0004424 \*\*\*  
## factor(Wk)23 -4.42308 7.84670 -0.5637 0.5729959   
## factor(Wk)24 -18.59088 7.85930 -2.3655 0.0180501 \*   
## factor(Wk)25 -32.67686 7.86527 -4.1546 3.320e-05 \*\*\*  
## factor(Wk)26 -77.81925 8.97371 -8.6719 < 2.2e-16 \*\*\*  
## factor(Wk)27 -65.15340 9.12514 -7.1400 1.084e-12 \*\*\*  
## factor(Wk)28 -84.01622 9.06227 -9.2710 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 65211000  
## Residual Sum of Squares: 20427000  
## R-Squared: 0.68676  
## Adj. R-Squared: 0.67037  
## F-statistic: 41.9089 on 234 and 4473 DF, p-value: < 2.22e-16

model12 <- plm(CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk + FpHomePgWk + FpCatPgWk + CpPriceDiscWk +  
 CpEmailWk + CpCatalogWk + CpHomePgWk + CpCatPgWk + I(VidWk\*CpCatPgWk) + factor(CpordID) + factor(Wk),  
 data = cp\_sales, model = 'pooling', index = c('CpordID', "Wk"))  
summary(model12)

## Pooling Model  
##   
## Call:  
## plm(formula = CpSales ~ VidWk + FpPriceDiscWk + FpEmailWk + FpCatalogWk +   
## FpHomePgWk + FpCatPgWk + CpPriceDiscWk + CpEmailWk + CpCatalogWk +   
## CpHomePgWk + CpCatPgWk + I(VidWk \* CpCatPgWk) + factor(CpordID) +   
## factor(Wk), data = cp\_sales, model = "pooling", index = c("CpordID",   
## "Wk"))  
##   
## Unbalanced Panel: n = 196, T = 8-28, N = 4708  
##   
## Residuals:  
## Min. 1st Qu. Median 3rd Qu. Max.   
## -936.1416 -22.7904 -2.7758 17.7988 1343.3204   
##   
## Coefficients:  
## Estimate Std. Error t-value Pr(>|t|)   
## (Intercept) 0.52571 13.91542 0.0378 0.9698659   
## VidWk 21.12061 4.23141 4.9914 6.223e-07 \*\*\*  
## FpPriceDiscWk -4.27133 5.00044 -0.8542 0.3930456   
## FpEmailWk -3.13665 17.34873 -0.1808 0.8565326   
## FpCatalogWk -9.71244 9.12771 -1.0641 0.2873587   
## FpHomePgWk 13.79790 6.19507 2.2272 0.0259810 \*   
## FpCatPgWk 6.65239 5.57228 1.1938 0.2326053   
## CpPriceDiscWk 89.26593 5.19897 17.1699 < 2.2e-16 \*\*\*  
## CpEmailWk 76.20862 20.57799 3.7034 0.0002153 \*\*\*  
## CpCatalogWk 102.77845 16.83901 6.1036 1.125e-09 \*\*\*  
## CpHomePgWk 63.26925 15.56911 4.0638 4.912e-05 \*\*\*  
## CpCatPgWk 62.00376 16.01894 3.8707 0.0001101 \*\*\*  
## I(VidWk \* CpCatPgWk) -57.18887 35.74453 -1.5999 0.1096839   
## factor(CpordID)1661 33.09430 18.16845 1.8215 0.0685937 .   
## factor(CpordID)1973 9.36159 18.14991 0.5158 0.6060245   
## factor(CpordID)1974 0.21624 18.19875 0.0119 0.9905203   
## factor(CpordID)2143 201.67069 18.20982 11.0748 < 2.2e-16 \*\*\*  
## factor(CpordID)2357 -6.12096 18.13660 -0.3375 0.7357616   
## factor(CpordID)2518 -1.21511 19.62854 -0.0619 0.9506409   
## factor(CpordID)2532 88.58466 20.53592 4.3136 1.640e-05 \*\*\*  
## factor(CpordID)2592 34.44370 20.53584 1.6772 0.0935639 .   
## factor(CpordID)2679 3.65065 18.17703 0.2008 0.8408337   
## factor(CpordID)2690 3.86494 18.17703 0.2126 0.8316271   
## factor(CpordID)2716 108.62976 18.18219 5.9745 2.487e-09 \*\*\*  
## factor(CpordID)2757 131.10840 18.10629 7.2410 5.216e-13 \*\*\*  
## factor(CpordID)2758 240.25341 18.15648 13.2324 < 2.2e-16 \*\*\*  
## factor(CpordID)2759 85.04889 18.46660 4.6056 4.228e-06 \*\*\*  
## factor(CpordID)2763 151.62522 19.60343 7.7346 1.273e-14 \*\*\*  
## factor(CpordID)2841 6.43245 18.16296 0.3542 0.7232417   
## factor(CpordID)2863 14.36494 18.17703 0.7903 0.4294063   
## factor(CpordID)2881 -8.57370 22.79431 -0.3761 0.7068355   
## factor(CpordID)2885 -1.81755 18.16296 -0.1001 0.9202940   
## factor(CpordID)2909 -0.83384 20.51159 -0.0407 0.9675750   
## factor(CpordID)3025 9.07923 18.17703 0.4995 0.6174596   
## factor(CpordID)3042 27.49578 24.13575 1.1392 0.2546749   
## factor(CpordID)3123 26.85657 18.08028 1.4854 0.1375066   
## factor(CpordID)3124 1.48482 18.15571 0.0818 0.9348233   
## factor(CpordID)3164 129.99659 18.18035 7.1504 1.006e-12 \*\*\*  
## factor(CpordID)3205 17.72555 21.74165 0.8153 0.4149551   
## factor(CpordID)3207 3.32127 20.20619 0.1644 0.8694483   
## factor(CpordID)3209 5.68969 20.20619 0.2816 0.7782775   
## factor(CpordID)3251 87.51354 19.16206 4.5670 5.080e-06 \*\*\*  
## factor(CpordID)3253 126.75057 18.18938 6.9684 3.674e-12 \*\*\*  
## factor(CpordID)3309 983.67265 18.29017 53.7815 < 2.2e-16 \*\*\*  
## factor(CpordID)3317 44.57466 18.19113 2.4504 0.0143097 \*   
## factor(CpordID)3349 6.05340 19.90489 0.3041 0.7610535   
## factor(CpordID)3423 38.82923 18.17703 2.1362 0.0327197 \*   
## factor(CpordID)3435 67.37671 18.20708 3.7006 0.0002177 \*\*\*  
## factor(CpordID)3441 15.72725 19.67206 0.7995 0.4240596   
## factor(CpordID)3446 11.42750 18.16962 0.6289 0.5294240   
## factor(CpordID)3462 20.64401 18.15897 1.1368 0.2556623   
## factor(CpordID)3466 15.54351 18.17703 0.8551 0.3925315   
## factor(CpordID)3474 -1.59935 18.17703 -0.0880 0.9298908   
## factor(CpordID)3479 74.33475 19.44971 3.8219 0.0001342 \*\*\*  
## factor(CpordID)3483 7.32923 18.17703 0.4032 0.6868104   
## factor(CpordID)3484 50.31809 18.19304 2.7658 0.0057018 \*\*   
## factor(CpordID)3485 -16.58594 23.38927 -0.7091 0.4782831   
## factor(CpordID)3487 -11.68225 23.42907 -0.4986 0.6180702   
## factor(CpordID)3490 -12.85118 18.45113 -0.6965 0.4861530   
## factor(CpordID)3492 19.37911 19.62260 0.9876 0.3234061   
## factor(CpordID)3494 56.18718 20.45874 2.7464 0.0060501 \*\*   
## factor(CpordID)3496 46.26334 18.15999 2.5475 0.0108817 \*   
## factor(CpordID)3500 191.77358 18.25945 10.5027 < 2.2e-16 \*\*\*  
## factor(CpordID)3506 26.60448 18.10034 1.4698 0.1416774   
## factor(CpordID)3508 -0.96397 18.10549 -0.0532 0.9575414   
## factor(CpordID)3509 95.21141 24.21298 3.9322 8.543e-05 \*\*\*  
## factor(CpordID)3570 2.58014 22.79431 0.1132 0.9098831   
## factor(CpordID)3573 20.31372 18.15102 1.1192 0.2631361   
## factor(CpordID)3576 78.84753 18.15046 4.3441 1.429e-05 \*\*\*  
## factor(CpordID)3577 11.97208 18.17703 0.6586 0.5101622   
## factor(CpordID)3578 -4.69523 18.08045 -0.2597 0.7951185   
## factor(CpordID)3580 17.16307 18.17697 0.9442 0.3451079   
## factor(CpordID)3585 2.48441 23.42907 0.1060 0.9155555   
## factor(CpordID)3619 30.77982 21.30613 1.4446 0.1486274   
## factor(CpordID)3622 22.22807 18.11787 1.2269 0.2199402   
## factor(CpordID)3627 45.97634 18.24092 2.5205 0.0117532 \*   
## factor(CpordID)3628 63.15600 18.20698 3.4688 0.0005278 \*\*\*  
## factor(CpordID)3671 224.62671 18.20708 12.3373 < 2.2e-16 \*\*\*  
## factor(CpordID)3674 -17.25732 22.36372 -0.7717 0.4403529   
## factor(CpordID)3675 19.67752 22.80200 0.8630 0.3881984   
## factor(CpordID)3678 16.83213 18.19971 0.9249 0.3550901   
## factor(CpordID)3680 98.71215 19.70012 5.0107 5.631e-07 \*\*\*  
## factor(CpordID)3711 10.53179 20.20619 0.5212 0.6022420   
## factor(CpordID)3720 50.98441 23.42907 2.1761 0.0295986 \*   
## factor(CpordID)3721 4.66460 19.81092 0.2355 0.8138656   
## factor(CpordID)3729 67.34100 18.20708 3.6986 0.0002194 \*\*\*  
## factor(CpordID)3749 31.82323 20.20617 1.5749 0.1153442   
## factor(CpordID)3751 68.06802 18.18035 3.7440 0.0001834 \*\*\*  
## factor(CpordID)3765 32.24659 18.18035 1.7737 0.0761798 .   
## factor(CpordID)3812 -1.81363 18.17703 -0.0998 0.9205266   
## factor(CpordID)3815 15.96263 18.16124 0.8789 0.3794811   
## factor(CpordID)3816 13.43637 18.17703 0.7392 0.4598275   
## factor(CpordID)3817 6.83537 18.15988 0.3764 0.7066377   
## factor(CpordID)3818 -3.05159 18.13751 -0.1682 0.8663960   
## factor(CpordID)3821 13.90768 19.69045 0.7063 0.4800287   
## factor(CpordID)3822 10.92555 21.74165 0.5025 0.6153287   
## factor(CpordID)3824 2.21322 18.16962 0.1218 0.9030560   
## factor(CpordID)3829 17.82923 18.17703 0.9809 0.3267121   
## factor(CpordID)3835 13.65065 18.17703 0.7510 0.4527020   
## factor(CpordID)3839 24.53076 18.16625 1.3503 0.1769726   
## factor(CpordID)3842 9.49925 20.53584 0.4626 0.6436955   
## factor(CpordID)3843 6.75115 18.15897 0.3718 0.7100738   
## factor(CpordID)3848 -3.66928 23.38927 -0.1569 0.8753476   
## factor(CpordID)3852 2.98279 18.13434 0.1645 0.8693585   
## factor(CpordID)3854 24.17972 18.15897 1.3316 0.1830733   
## factor(CpordID)3857 21.39476 18.07989 1.1833 0.2367352   
## factor(CpordID)3861 40.85147 18.27578 2.2353 0.0254482 \*   
## factor(CpordID)3864 118.91243 18.20708 6.5311 7.257e-11 \*\*\*  
## factor(CpordID)3866 14.28687 18.15897 0.7868 0.4314604   
## factor(CpordID)3871 57.21732 21.30613 2.6855 0.0072692 \*\*   
## factor(CpordID)3873 293.46346 18.49517 15.8670 < 2.2e-16 \*\*\*  
## factor(CpordID)3875 62.98521 22.80200 2.7623 0.0057636 \*\*   
## factor(CpordID)3876 109.57686 20.90475 5.2417 1.664e-07 \*\*\*  
## factor(CpordID)3877 61.63486 19.81118 3.1111 0.0018756 \*\*   
## factor(CpordID)3878 34.93072 18.15263 1.9243 0.0543830 .   
## factor(CpordID)3880 161.37671 18.20708 8.8634 < 2.2e-16 \*\*\*  
## factor(CpordID)3881 98.32184 18.51218 5.3112 1.142e-07 \*\*\*  
## factor(CpordID)3885 34.34020 21.74996 1.5789 0.1144382   
## factor(CpordID)3886 63.42654 18.12296 3.4998 0.0004702 \*\*\*  
## factor(CpordID)3891 84.32112 20.90535 4.0335 5.588e-05 \*\*\*  
## factor(CpordID)3895 58.27984 18.16106 3.2091 0.0013411 \*\*   
## factor(CpordID)3904 117.65603 18.17141 6.4748 1.052e-10 \*\*\*  
## factor(CpordID)3905 164.43877 20.90535 7.8659 4.562e-15 \*\*\*  
## factor(CpordID)3915 106.06802 18.18035 5.8342 5.786e-09 \*\*\*  
## factor(CpordID)3916 95.48344 24.31837 3.9264 8.753e-05 \*\*\*  
## factor(CpordID)3919 -1.13664 18.51255 -0.0614 0.9510445   
## factor(CpordID)3925 102.73146 18.19381 5.6465 1.739e-08 \*\*\*  
## factor(CpordID)3926 117.45848 18.17017 6.4644 1.126e-10 \*\*\*  
## factor(CpordID)3929 47.51957 18.20708 2.6100 0.0090857 \*\*   
## factor(CpordID)3937 44.76259 19.64080 2.2791 0.0227103 \*   
## factor(CpordID)3938 277.58389 18.31194 15.1586 < 2.2e-16 \*\*\*  
## factor(CpordID)3942 108.36891 18.19708 5.9553 2.795e-09 \*\*\*  
## factor(CpordID)3944 20.37111 18.10310 1.1253 0.2605296   
## factor(CpordID)3949 100.09465 18.16277 5.5110 3.769e-08 \*\*\*  
## factor(CpordID)3954 72.27825 18.23648 3.9634 7.505e-05 \*\*\*  
## factor(CpordID)3955 67.19556 20.55089 3.2697 0.0010847 \*\*   
## factor(CpordID)3959 99.95594 22.25637 4.4911 7.264e-06 \*\*\*  
## factor(CpordID)3960 91.84100 18.20708 5.0442 4.733e-07 \*\*\*  
## factor(CpordID)3961 8.93417 18.26130 0.4892 0.6246953   
## factor(CpordID)3965 86.20704 18.25892 4.7214 2.414e-06 \*\*\*  
## factor(CpordID)3968 27.26957 18.20708 1.4977 0.1342700   
## factor(CpordID)3969 15.21822 18.18172 0.8370 0.4026336   
## factor(CpordID)3970 24.57531 18.16296 1.3530 0.1761096   
## factor(CpordID)3972 37.36822 18.26700 2.0457 0.0408474 \*   
## factor(CpordID)3973 21.90545 19.64080 1.1153 0.2647804   
## factor(CpordID)3974 38.00780 18.17703 2.0910 0.0365862 \*   
## factor(CpordID)3975 5.87768 18.15571 0.3237 0.7461522   
## factor(CpordID)3976 10.76889 18.14758 0.5934 0.5529393   
## factor(CpordID)3978 24.17931 18.08988 1.3366 0.1814144   
## factor(CpordID)3979 55.31347 18.15073 3.0475 0.0023214 \*\*   
## factor(CpordID)3981 3.25061 18.12029 0.1794 0.8576393   
## factor(CpordID)3982 48.71752 18.19113 2.6781 0.0074314 \*\*   
## factor(CpordID)3984 135.49659 18.18035 7.4529 1.090e-13 \*\*\*  
## factor(CpordID)3985 65.09196 18.15571 3.5852 0.0003404 \*\*\*  
## factor(CpordID)3986 45.84196 18.15571 2.5249 0.0116063 \*   
## factor(CpordID)3995 16.91778 20.55089 0.8232 0.4104301   
## factor(CpordID)4001 26.48754 18.15597 1.4589 0.1446660   
## factor(CpordID)4006 145.70152 18.19936 8.0059 1.500e-15 \*\*\*  
## factor(CpordID)4007 124.21088 18.18035 6.8322 9.489e-12 \*\*\*  
## factor(CpordID)4009 105.07152 18.11498 5.8003 7.078e-09 \*\*\*  
## factor(CpordID)4013 5.79634 20.53506 0.2823 0.7777528   
## factor(CpordID)4014 20.34667 18.12363 1.1227 0.2616421   
## factor(CpordID)4015 -6.37141 18.11393 -0.3517 0.7250490   
## factor(CpordID)4016 67.07923 18.17703 3.6903 0.0002266 \*\*\*  
## factor(CpordID)4017 17.53184 18.09829 0.9687 0.3327464   
## factor(CpordID)4019 28.22208 18.17703 1.5526 0.1205839   
## factor(CpordID)4028 18.60539 18.81909 0.9886 0.3228905   
## factor(CpordID)4031 151.56802 18.18035 8.3369 < 2.2e-16 \*\*\*  
## factor(CpordID)4032 34.32923 18.17703 1.8886 0.0590095 .   
## factor(CpordID)4037 40.87928 18.13187 2.2546 0.0242095 \*   
## factor(CpordID)4038 13.41625 18.25824 0.7348 0.4624964   
## factor(CpordID)4040 67.44515 18.15219 3.7155 0.0002052 \*\*\*  
## factor(CpordID)4042 37.46874 18.14991 2.0644 0.0390370 \*   
## factor(CpordID)4043 25.18026 18.18427 1.3847 0.1662049   
## factor(CpordID)4055 23.57524 18.15987 1.2982 0.1942837   
## factor(CpordID)4063 -9.56363 19.67893 -0.4860 0.6270028   
## factor(CpordID)4068 186.85373 18.18035 10.2778 < 2.2e-16 \*\*\*  
## factor(CpordID)4069 59.66965 18.18337 3.2816 0.0010403 \*\*   
## factor(CpordID)4074 79.52950 19.99214 3.9780 7.058e-05 \*\*\*  
## factor(CpordID)4084 174.85521 18.54856 9.4269 < 2.2e-16 \*\*\*  
## factor(CpordID)4088 226.05351 18.80808 12.0190 < 2.2e-16 \*\*\*  
## factor(CpordID)4089 17.60691 20.34633 0.8654 0.3868871   
## factor(CpordID)4118 278.61602 18.79093 14.8272 < 2.2e-16 \*\*\*  
## factor(CpordID)4134 37.69003 19.60999 1.9220 0.0546715 .   
## factor(CpordID)4136 17.11709 21.87168 0.7826 0.4338951   
## factor(CpordID)4137 38.65705 22.96950 1.6830 0.0924501 .   
## factor(CpordID)4140 37.99177 19.92101 1.9071 0.0565689 .   
## factor(CpordID)4142 30.13736 19.64217 1.5343 0.1250219   
## factor(CpordID)4143 36.28722 18.68179 1.9424 0.0521533 .   
## factor(CpordID)4144 56.69494 18.93467 2.9942 0.0027664 \*\*   
## factor(CpordID)4147 -5.19994 19.62977 -0.2649 0.7910983   
## factor(CpordID)4151 73.27070 27.41086 2.6731 0.0075437 \*\*   
## factor(CpordID)4153 46.90263 22.82287 2.0551 0.0399301 \*   
## factor(CpordID)4154 25.51890 19.90072 1.2823 0.1998002   
## factor(CpordID)4155 49.88860 18.64441 2.6758 0.0074824 \*\*   
## factor(CpordID)4156 187.77122 18.75486 10.0119 < 2.2e-16 \*\*\*  
## factor(CpordID)4160 16.11859 22.96950 0.7017 0.4828785   
## factor(CpordID)4162 8.02762 19.92097 0.4030 0.6869870   
## factor(CpordID)4163 21.24786 19.93116 1.0661 0.2864531   
## factor(CpordID)4164 106.96393 19.98681 5.3517 9.148e-08 \*\*\*  
## factor(CpordID)4170 14.07332 19.58726 0.7185 0.4724906   
## factor(CpordID)4178 59.08539 19.93971 2.9632 0.0030606 \*\*   
## factor(CpordID)4190 142.03175 18.99689 7.4766 9.127e-14 \*\*\*  
## factor(CpordID)4191 43.25792 19.64908 2.2015 0.0277498 \*   
## factor(CpordID)4198 38.22543 19.84691 1.9260 0.0541658 .   
## factor(CpordID)4206 142.02604 20.56461 6.9063 5.672e-12 \*\*\*  
## factor(CpordID)4212 136.91213 23.67841 5.7822 7.877e-09 \*\*\*  
## factor(CpordID)4251 269.04499 23.04644 11.6740 < 2.2e-16 \*\*\*  
## factor(Wk)2 -17.14532 7.56424 -2.2666 0.0234605 \*   
## factor(Wk)3 24.55278 7.51555 3.2669 0.0010954 \*\*   
## factor(Wk)4 36.11143 7.47913 4.8283 1.423e-06 \*\*\*  
## factor(Wk)5 12.64792 7.46422 1.6945 0.0902451 .   
## factor(Wk)6 28.08494 7.47395 3.7577 0.0001737 \*\*\*  
## factor(Wk)7 51.73453 7.43818 6.9553 4.028e-12 \*\*\*  
## factor(Wk)8 11.42521 7.40637 1.5426 0.1229940   
## factor(Wk)9 -11.46496 7.31624 -1.5671 0.1171725   
## factor(Wk)10 56.36060 7.29200 7.7291 1.329e-14 \*\*\*  
## factor(Wk)11 24.33586 7.35189 3.3101 0.0009399 \*\*\*  
## factor(Wk)12 -7.76443 7.36724 -1.0539 0.2919796   
## factor(Wk)13 -3.52051 8.16961 -0.4309 0.6665421   
## factor(Wk)14 9.59145 7.47749 1.2827 0.1996605   
## factor(Wk)15 -3.98424 7.48190 -0.5325 0.5943949   
## factor(Wk)16 -16.85363 7.49403 -2.2489 0.0245647 \*   
## factor(Wk)17 -27.50770 7.47879 -3.6781 0.0002377 \*\*\*  
## factor(Wk)18 9.68090 7.51390 1.2884 0.1976737   
## factor(Wk)19 -5.64321 7.60576 -0.7420 0.4581476   
## factor(Wk)20 -3.48964 7.65356 -0.4559 0.6484484   
## factor(Wk)21 -59.20626 8.36041 -7.0817 1.646e-12 \*\*\*  
## factor(Wk)22 -27.87830 7.84915 -3.5518 0.0003866 \*\*\*  
## factor(Wk)23 -4.77707 7.85080 -0.6085 0.5428986   
## factor(Wk)24 -18.82325 7.86334 -2.3938 0.0167159 \*   
## factor(Wk)25 -32.89485 7.86936 -4.1801 2.969e-05 \*\*\*  
## factor(Wk)26 -77.58941 8.97846 -8.6417 < 2.2e-16 \*\*\*  
## factor(Wk)27 -65.24374 9.13032 -7.1458 1.040e-12 \*\*\*  
## factor(Wk)28 -84.00680 9.06746 -9.2646 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Total Sum of Squares: 65211000  
## Residual Sum of Squares: 20450000  
## R-Squared: 0.6864  
## Adj. R-Squared: 0.66999  
## F-statistic: 41.839 on 234 and 4473 DF, p-value: < 2.22e-16