

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	**

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## 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 .

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## 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

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## 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	

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## 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 .

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## 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	***
## factor(ProdID)4006	111.748840	22.837776	4.8932	1.016e-06	***
## 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	***

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## 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 ***

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## 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 ***

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## 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	.

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## 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

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## 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

```