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# 19

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## *Market Segmentation Based on Time-Series Data Using Latent Class Analysis*

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### **Appendix 19.A Creating Trend3 for UNITS**

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```
libname lcat 'c:\0-LCA-t';
```

```
data UNITS_vars;
```

```
set lcat.UNITS_2001_14;
```

```
keep Comp_ID
```

```
UNITS_2001Q1
```

```
UNITS_2001Q2 UNITS_2001Q3 UNITS_2001Q4 UNITS_2002Q1 UNITS_2002Q2
```

```
UNITS_2002Q3 UNITS_2002Q4
```

```
UNITS_2003Q1 UNITS_2003Q2 UNITS_2003Q3 UNITS_2003Q4 UNITS_2004Q1
```

```
UNITS_2004Q2 UNITS_2004Q3
```

```
UNITS_2004Q4 UNITS_2005Q1 UNITS_2005Q2 UNITS_2005Q3 UNITS_2005Q4
```

```
UNITS_2006Q1 UNITS_2006Q2
```

```
UNITS_2006Q3 UNITS_2006Q4 UNITS_2007Q1 UNITS_2007Q2 UNITS_2007Q3
```

```
UNITS_2007Q4 UNITS_2008Q1
```

```
UNITS_2008Q2 UNITS_2008Q3 UNITS_2008Q4 UNITS_2009Q1 UNITS_2009Q2
```

```
UNITS_2009Q3 UNITS_2009Q4
```

```
UNITS_2010Q1 UNITS_2010Q2 UNITS_2010Q3 UNITS_2010Q4 UNITS_2011Q1
```

```
UNITS_2011Q2 UNITS_2011Q3
```

```
UNITS_2011Q4 UNITS_2012Q1 UNITS_2012Q2 UNITS_2012Q3 UNITS_2012Q4
```

```
UNITS_2013Q1  UNITS_2013Q2
UNITS_2013Q3  UNITS_2013Q4  UNITS_2014Q1  UNITS_2014Q2  UNITS_2014Q3
UNITS_2014Q4;
run;
```

```
PROC TRANSPOSE data=UNITS_vars out =outtrans;
id Comp_ID;
run;
```

```
data trend1;
set outtrans;
TIME+1;
TREND_COEFF_2001=TIME;
TREND_COEFF_2002=TIME;
TREND_COEFF_2003=TIME;
TREND_COEFF_2004=TIME;
TREND_COEFF_2005=TIME;
TREND_COEFF_2006=TIME;
TREND_COEFF_2007=TIME;
TREND_COEFF_2008=TIME;
TREND_COEFF_2009=TIME;
TREND_COEFF_2010=TIME;
TREND_COEFF_2011=TIME;
TREND_COEFF_2012=TIME;
TREND_COEFF_2013=TIME;
TREND_COEFF_2014=TIME;
```

```
if TREND_COEFF_2001 gt 4 then TREND_COEFF_2001=.;
if TREND_COEFF_2002 gt 8 then TREND_COEFF_2002=.;
if TREND_COEFF_2003 gt 12 then TREND_COEFF_2003=.;
if TREND_COEFF_2004 gt 16 then TREND_COEFF_2004=.;
if TREND_COEFF_2005 gt 20 then TREND_COEFF_2005=.;
if TREND_COEFF_2006 gt 24 then TREND_COEFF_2006=.;
if TREND_COEFF_2007 gt 28 then TREND_COEFF_2007=.;
if TREND_COEFF_2008 gt 32 then TREND_COEFF_2008=.;
if TREND_COEFF_2009 gt 36 then TREND_COEFF_2009=.;
if TREND_COEFF_2010 gt 40 then TREND_COEFF_2010=.
```

```
if TREND_COEFF_2011 gt 44 then TREND_COEFF_2011=.;
if TREND_COEFF_2012 gt 48 then TREND_COEFF_2012=.;
if TREND_COEFF_2013 gt 52 then TREND_COEFF_2013=.;
if TREND_COEFF_2014 gt 56 then TREND_COEFF_2014=.;
drop TIME;
run;
```

```
title1 'TREND_COEFFs trend1';
PROC CORR data=trend1 outp=trend2; with _1 - _3402;
var TREND_COEFF_2001 - TREND_COEFF_2014;
run;
```

```
data trend3;
set trend2;
if _TYPE_='MEAN' then delete;
if _TYPE_='STD' then delete;
if _TYPE_='N' then delete;
drop _TYPE_;
rename _NAME_=Comp_ID;
```

```
data lcat.trend3;
set trend3;
Comp_ID=substr(Comp_ID,2);
array num(*) _numeric_;
do j = 1 to dim(num);
if missing(num(j)) then num(j)=0;
end;
drop j;
run;
```

```
PROC CONTENTS;
run;
```

```
PROC PRINT data=lcat.trend3 (obs=5);
var Comp_ID TREND_COEFF_2001 - TREND_COEFF_2007;
run;
```

```

PROC PRINT data=lcat.trend3 (obs=5);
var Comp_ID TREND_COEFF_2008 - TREND_COEFF_2014;
title3 ' trends for UNITS ';
run;

```

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## Appendix 19.B POS-ZER-NEG Creating Trend4

---

```

libname lcat 'c:\0-LCA-t';

data lcat.trend4_data;
set lcat.trend3;
array tr(14) trend_coeff_2001 - trend_coeff_2014;
array pos(14) ptrend_coeff_2001 - ptrend_coeff_2014;
array neg(14) ntrend_coeff_2001 - ntrend_coeff_2014;
array zer(14) ztrend_coeff_2001 - ztrend_coeff_2014;

array ppos(14) pptrend_coeff_2001 - pptrend_coeff_2014;
array nneg(14) nntrend_coeff_2001 - nntrend_coeff_2014;
array nzer(14) nztrend_coeff_2001 - nztrend_coeff_2014;

do i=1 to 14;
if tr(i) gt 0 then pos(i)=tr(i); else pos(i)=.;
AVG_POS_TREND=mean(of ptrend_coeff_2001 - ptrend_coeff_2014);
if AVG_POS_TREND=. then AVG_POS_TREND=0;

if tr(i) lt 0 then neg(i)=tr(i); else neg(i)=.;
AVG_NEG_TREND=mean(of ntrend_coeff_2001 - ntrend_coeff_2014);
if AVG_NEG_TREND=. then AVG_NEG_TREND=0;

if tr(i) eq 0 then zer(i)=tr(i);else zer(i)=.;
AVG_ZER_TREND=mean(of ztrend_coeff_2001 - ztrend_coeff_2014);
if AVG_ZER_TREND=. then AVG_ZER_TREND=0;

```

```
if tr(i) gt 0 then ppos(i)=1; else ppos(i)=0;
N_POS_TRENDS=sum(of pptrend_coeff_2001 - pptrend_coeff_2014);
if tr(i) lt 0 then nneg(i)=1; else nneg(i)=0;
N_NEG_TRENDS=sum(of nntrend_coeff_2001 - nntrend_coeff_2014);
if tr(i) eq 0 then nzer(i)=1; else nzer(i)=0;
N_ZER_TRENDS=sum(of nztrend_coeff_2001 - nztrend_coeff_2014);
end;
drop i;
run;
```

```
PROC PRINT data= lcat.trend4_data (obs=5);
var Comp_ID
N_POS_TRENDS AVG_POS_TREND
N_NEG_TRENDS AVG_NEG_TREND
N_ZER_TRENDS;
run;
```