Danmarks Statistik
MODELGRUPPEN

Arbejdspapir*

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Reestimation af eksportrelationerne april 2000

Resumé:

I papiret præsenteres en reestimation af eksportrelationerne på nye tal med basisåret 1995

TMK14300.wp

Nøgleord: Eksport apr00

1. Indledning

Eksportrelationerne er specificeret på fejlkorrektionsform

$$dlog(fE_j) = \alpha_1 \cdot dlog(fEe_j) + \alpha_2 \cdot dlog(\frac{pe_j}{pee_j}) + my \cdot [\log(\frac{fE_{j,-1}}{fEe_{j,-1}}) - \beta * \log(\frac{pe_{j,-1}}{pee_{j,-1}}) - km] \quad \textbf{(1a)}$$

For industrieksportens vedkommende er relationerne estimeret multivariat sammen med en prisrelation på følgende form

$$dlog(pe_j) = \gamma_1 \cdot dlog(pwe_{jmv}) + \gamma_2 \cdot dlog(pee_j) + \kappa \cdot [\log(\frac{pe_{j,-1}}{pwe_j w_{-1}}) - kp] \quad \textbf{(1b)}$$

Resultaterne af estimationerne gengives i tabel 1 og tabel 2.

Tabel 1 Sitc 0, 2 - mængderrelationer, december 1999

Sitc-gruppe	α_1	α_2	μ	β	s	DW	R^2
Sitc 0	0.1843 (0.2718)	-0.2224 (0.1087)	-0.1466 (0.0691)	-1.5171 (-)	0.0183	2.6721	0.4828
Sitc 2	0.3357 (0.3826)	-0.2341 (0.2315)	-0.15 (-)	-1.5607 (-)	0.0777	1.8125	0.2643

Estimationsperiode: Sitc 0 1973-1990 og Sitc 2 1971-1990

Tabel 2a Sitc 5,6,7q,8 - mængderelationer, december 1999

Sitc-gruppe	α_1	α_2	μ	β	s	DW	R^2
Sitc 5	0.7728 (0.1234)	-0.5804 (0.1401)	-0.15 (-)	-3.0110 (0.6587)	0.0273	2.2363	0.7422
Sitc 6	0.5088 (0.2478)	-0.7520 (0.2705)	-0.15 (-)	-2.7120 (1.0375)	0.0452	2.1678	0.3650
Sitc 7q	0.5257 (0.1128)	-0.5827 (0.1046)	-0.15 (-)	-1.00 (-)	0.0270	1.5699	0.7317
Sitc 8	0.6143 (0.1140)	-0.2047 (0.1700)	-0.15 (-)	-2.9340 (0.3050)	0.0417	0.6765	0.3877

Estimationsperiode 1971-1990

Tabel 2b Sitc 5,6,7q,8 - prisrelationer, december 1999

Sitc-gruppe	γ_1	γ_2	κ	s	DW	R^2
Sitc 5	0.8988 (0.0724)	-0.0466 (0.0800)	-0.4437 (0.0285)	0.0178	1.8548	0.9269
Sitc 6	1.0748 (0.1046)	0.0359 (0.0719)	-0.4437 (0.0285)	0.0151	2.0757	0.9105
Sitc 7q	0.5741 (0.1372)	0.1593 (0.0915)	-0.4437 (0.0285)	0.0214	0.7825	0.6319
Sitc 8	0.4421 (0.0638)	0.1198 (0.0576)	-0.4437 (0.0285)	0.0151	0.8699	0.7955

Estimationsperiode 1971-1990

Bemærk at der i markedsudtrykkene for industrieksporten er foretaget en korrektion for genforeningen af Tyskland. Korrektionen betød at markedet øges med 31% i 1991. Estimationsperioden omfattede ikke genforeningskorrektionen.

Det viser sig desværre at genforeningsdummyen fungerer dårligt, når eksportrelationerne estimeres frem til 1995. I stedet foreslås en genforeningsdummy medtaget i mængderelationen:

$$dlog(fE_j) = \alpha_1 \cdot dlog(fEe_j) + \alpha_2 \cdot dlog(\frac{pe_j}{pee_j}) + \alpha_3 \cdot (d - d_{-1}) + my \cdot [\log(\frac{fE_{j,-1}}{fEe_{j,-1} \cdot (1 + \beta_2 \cdot d_{-1})}) - \beta * \log(\frac{pe_{j,-1}}{pee_{j,-1}}) - km] \quad \textbf{(2a)}$$

Det foreslås samtidig at lade konkurrentprisen indgå med et lag i kortsigtsdelen af prisrelationen:

$$dlog(pe_j) = \gamma_1 \cdot dlog(pwe_{jw}) + \gamma_2 \cdot dlog(pee_{j,-1}) + \kappa \cdot [\log(\frac{pe_{j,-1}}{pwe_j w_{-1}}) - kp] \quad \textbf{(2b)}$$

Resulaterne af reestimationen fremgår af tabel 3 og 4.

Tabel 3 Sitc 0, 2 - mængderrelationer, reestimation

Sitc-gruppe	α_1	α_2	α_3	μ	β_1	β_2	s	DW	R^2
Sitc 0	0.50 (-)	-0.6102 (0.1443)	-0.0388 (0.0346)	-0.1749 (0.0910)	-2.2943 (1.0161)	-0.0646 (0.1011)	0.0283	2.4239	0.4980
Sitc 2	0.3161 (0.3163)	-.2136 (-)	- (-)	-0.15 (-)	1.4237 (0.8865)	- (-)	0.0734	2.0376	0.4383

Estimationsperiode: Sitc 0 1973-1995 og Sitc 2 1972-1995

Tabel 4a Sitc 5,6,7q,8 - mængderelationer, reestimation

Sitc-gruppe	α_1	α_2	α_3	μ	β_1	β_2	s	DW	R^2
Sitc 5	1.00 (-)	-0.7192 (0.0832)	-0.0861 (0.0183)	-0.15 -	-3.7549 (0.7362)	-0.5805 (0.0693)	0.0281	2.0790	0.7440
Sitc 6	0.8919 (0.1676)	-0.7416 (0.2249)	-0.0436 (0.0467)	-0.15 -	-3.3301 (1.8675)	-0.4399 (0.2348)	0.0442	1.9903	0.3820
Sitc 7q	1.00 (-)	-0.5781 (0.1049)	-0.0106 (0.0231)	-0.15 -	-1.00 (-)	-0.2032 (0.0704)	0.0273	2.0480	0.7482
Sitc 8	0.6639 (0.1347)	-0.4598 (0.1357)	-0.1325 (0.0365)	-0.15 -	-2.9548 (0.6636)	-0.4846 (0.1144)	0.0363	0.8090	0.5150

Estimationsperiode 1972-1995

Tabel 4b Sitc 5,6,7q,8 - prisrelationer, reestimation

Sitc-gruppe	γ_1	γ_2	κ	s	DW	R^2
Sitc 5	0.8004 (0.0359)	0.1476 (0.0370)	-0.1671 (0.0542)	0.0184	1.8623	0.9150
Sitc 6	1.00 (-)	0.0922 (0.0612	-0.4490 (0.0561)	0.0200	1.4239	0.8615
Sitc 7q	0.4804 (0.0670)	0.2123 (0.0526)	-0.20 (-)	0.0189	0.8717	0.7707
Sitc 8	0.4929 (0.0391)	0.0891 (0.0463)	-0.2795 (0.0710)	0.0157	1.2276	0.8671

Estimationsperiode: 1972-1995

Reestimationen giver ikke væsentligt forskellige resultater. Det mest iøjnefaldende er at priselasticieten på kort sigt estimere lidt større og mere signifinkant. Derfor er tilpasningsparameteren bundet lidt ned. Hermed fås nogenlunde samme langsigtede priselasticietet som tildligere.

I prisrelationen fås en større og mere signifikant konkurrentpriseffekt. Genforeningsdummy kommer i de fleste tilfælde signifikant ind i mængderelationen.

Den samlede effekt af Tysklands genforening er næppe væsentlig anderledes end tidligere beregnet. Forskellen er snarere at specifikationen tillader en mindre 1. års effekt og at der er forskellig effekt på de forskellige varegrupper.

Bilag 1. Estimationsoutput - Sitc 5,6,7q,8

Estimationsligning:

```
FRML sdlfe5 dlfe5 = g115*log(fee5/fee5(-1))
                  +g125*(dlpe5 -log(pee5/pee5(-1)))
                  +g135*(d-d(-1))
                  +alfaf15*(log(fe5(-1)/(fee5(-1)*(1+d15*d(-1))))
                              -beta15*log(pe5(-1)/pee5(-1))
                              -k15) ;
FRML sdlpe5 dlpe5 = g215*log(pwe5nv/pwe5nv(-1))
                  +g225*log(pee5(-1)/pee5(-2))
                  +alfap25*(log(pe5(-1)/pwe5w(-1))
                              - k25) ;
```

```
                        MULTIVARIATE REGRESSION
                        ======================

EQUATIONS: SDLPE5 SDLFE5 SDLPE6 SDLFE6 SDLPE7 SDLFE7 SDLPE8
    SDLFE8

                                  CONSTANTS:

                 G115       ALFAF15          G216       ALFAF16       ALFAP27
VALUE         1.00000      -0.10000       1.00000      -0.10000      -0.20000
                 BETA17       ALFAF17       ALFAF18
VALUE        -1.00000      -0.15000      -0.15000

                            Residual Covariance Matrix

               SDLPE5        SDLFE5        SDLPE6        SDLFE6        SDLPE7
SDLPE5      0.00039237
SDLFE5      0.00046207    0.00083411
SDLPE6    -1.18040D-06   0.000039066    0.00040345
SDLFE6     0.000043707    0.00046726   -0.00019457     0.0019544
SDLPE7     0.000070744    0.00016071    0.00022210   0.000062076    0.00032650
SDLFE7      0.00037288    0.00039002  -0.000058486    0.00012464  -0.000033630
SDLPE8    -1.98565D-06    0.00010960    0.00026229   0.000078602    0.00020685
SDLFE8      0.00014355   0.000060414   -0.00036395    0.00016724   -0.00032393


               SDLFE7        SDLPE8        SDLFE8
SDLFE7       0.0012953
SDLPE8     0.000080643    0.00027174
SDLFE8      0.00033809   -0.00034049     0.0014357

                                 Weighting Matrix

               SDLPE5        SDLFE5        SDLPE6        SDLFE6        SDLPE7
SDLPE5        50.48403     -69.16001       8.38919      48.73926      -4.84349
SDLFE5                      58.72685      -6.99556     -44.07817      -7.08815
SDLPE6                                    50.13784      18.37247     -43.23412
SDLFE6                                                  28.95078      -4.89811
SDLPE7                                                                75.46518


               SDLFE7        SDLPE8        SDLFE8
SDLPE5       -44.49209      76.70436       3.27523
SDLFE5         9.06019     -36.20072      -4.25688
SDLPE6        -5.44029     -80.33312     -16.60577
SDLFE6        -4.27182      -4.37217      -5.65604
SDLPE7        13.15216     -47.90757       9.28620
SDLFE7        33.57823     -25.64886     -12.62198
SDLPE8                     160.91139      60.41487
SDLFE8                                    35.38225
```

Covariance Matrix of Transformed Residuals

	SDLPE5	SDLFE5	SDLPE6	SDLFE6	SDLPE7
SDLPE5	24.00000				
SDLFE5	6.06390D-15	24.00000			
SDLPE6	-1.33108D-15	-1.49295D-16	24.00000		
SDLFE6	-1.23075D-15	3.16426D-15	-1.10884D-15	24.00000	
SDLPE7	-6.77138D-16	-4.21576D-15	3.15199D-15	2.29550D-15	24.00000
SDLFE7	2.34394D-15	-7.68680D-15	1.13733D-15	4.40305D-15	-1.81631D-15
SDLPE8	-5.36469D-15	7.63932D-15	1.16805D-14	-1.90909D-15	-5.55654D-15
SDLFE8	-1.32376D-15	2.53679D-15	1.08680D-15	-1.69680D-15	2.47241D-15

	SDLFE7	SDLPE8	SDLFE8
SDLFE7	24.00000		
SDLPE8	5.55003D-15	24.00000	
SDLFE8	2.48055D-15	-5.86987D-15	24.00000

Log of Likelihood Function = 489.793
Number of Observations = 24

Parameter	Estimate	Standard Error	t-statistic
G215	.779143	.033610	23.1822
G225	.149129	.034911	4.27171
ALFAP25	-.094458	.049764	-1.89812
K25	.042016	.049297	.852300
G125	-.748479	.077443	-9.66493
G135	-.082969	.017597	-4.71485
D15	-.569593	.066948	-8.50796
BETA15	-3.40488	.686975	-4.95634
K15	10.4048	.103200	100.821
G226	.091790	.060963	1.50567
ALFAP26	-.454456	.056361	-8.06329
K26	-.601210E-02	.010853	-.553982
G116	.907722	.170317	5.32960
G126	-.823490	.226539	-3.63510
G136	-.045627	.047150	-.967704
D16	-.440080	.236917	-1.85753
BETA16	-3.17787	1.87897	-1.69128
K16	10.3770	.273443	37.9495
G217	.526244	.068661	7.66443
G227	.201405	.051752	3.89174
K27	.071761	.026736	2.68409
G117	1.17268	.122163	9.59929
G137	-.021766	.027801	-.782916
D17	-.185954	.084685	-2.19584
K17	11.0588	.103025	107.341
G218	.469279	.039416	11.9059
G228	.082025	.047201	1.73778
ALFAP28	-.300176	.073130	-4.10467
K28	.067538	.025373	2.66185
G118	.711013	.139247	5.10612
G128	-.325786	.134652	-2.41946
G138	-.135765	.037292	-3.64058
D18	-.519231	.107711	-4.82060
BETA18	-3.21708	.664895	-4.83849
K18	10.5973	.125995	84.1095

Standard Errors computed from quadratic form of analytic first derivatives (Gauss)

Equation SDLPE5
==========

Dependent variable: DLPE5

Mean of dependent variable = .051883
Std. error of regression = .019808
Std. dev. of dependent var. = .063584
R-squared = .906507
Sum of squared residuals = .941680E-02
Durbin-Watson statistic = 1.85833
Variance of residuals = .392366E-03

Equation SDLFE5
==========

```
Dependent variable: DLFE5

 Mean of dependent variable = .066483        Std. error of regression = .028881
Std. dev. of dependent var. = .051051                     R-squared = .734218
   Sum of squared residuals = .020019         Durbin-Watson statistic = 2.05527
      Variance of residuals = .834115E-03

                              Equation    SDLPE6
                              ==================

Dependent variable: DLPE6

 Mean of dependent variable = .056769        Std. error of regression = .020086
Std. dev. of dependent var. = .052684                     R-squared = .859389
   Sum of squared residuals = .968284E-02     Durbin-Watson statistic = 1.39938
      Variance of residuals = .403452E-03

                              Equation    SDLFE6
                              ==================

Dependent variable: DLFE6

 Mean of dependent variable = .043162        Std. error of regression = .044209
Std. dev. of dependent var. = .057057                     R-squared = .384602
   Sum of squared residuals = .046906         Durbin-Watson statistic = 2.04094
      Variance of residuals = .195441E-02

                              Equation    SDLPE7
                              ==================

Dependent variable: DLPE7Q

 Mean of dependent variable = .054631        Std. error of regression = .018069
Std. dev. of dependent var. = .039100                     R-squared = .788251
   Sum of squared residuals = .783601E-02     Durbin-Watson statistic = .890748
      Variance of residuals = .326501E-03

                              Equation    SDLFE7
                              ==================

Dependent variable: DLFE7Q

 Mean of dependent variable = .048855        Std. error of regression = .035990
Std. dev. of dependent var. = .054330                     R-squared = .586013
   Sum of squared residuals = .031087         Durbin-Watson statistic = 1.67830
      Variance of residuals = .129531E-02

                              Equation    SDLPE8
                              ==================

Dependent variable: DLPE8

 Mean of dependent variable = .060066        Std. error of regression = .016485
Std. dev. of dependent var. = .038440                     R-squared = .857269
   Sum of squared residuals = .652185E-02     Durbin-Watson statistic = 1.17007
      Variance of residuals = .271744E-03

                              Equation    SDLFE8
                              ==================

Dependent variable: DLFE8

 Mean of dependent variable = .051857        Std. error of regression = .037891
Std. dev. of dependent var. = .051213                     R-squared = .477909
   Sum of squared residuals = .034457         Durbin-Watson statistic = .761518
      Variance of residuals = .143569E-02
```

Bilag 2. Estimationsoutput - Sitc 0

Estimationligning:

```
FRML sdlpe0 dlpe0  =   g210*log(pwe0nv/pwe0nv(-1))
                     + g220*log(pee0(-1)/pee0(-2))
                     + alfap20*(log(pe0(-1)/pwe0w(-1))
                     - k20)  ;
FRML sdlfe0k dlfe0k  =   g110*log(fee0/fee0(-1))
                     + g120*(dlpe0 -log(pee0/pee0(-1)) )
                     + g130*(d-d(-1))
                     + alfaf10*(log(fe0k(-1)/(fee0(-1)*(1+d10*d(-1))))
                               -beta10*log(pe0(-1)/pee0(-1))
                               -k10) ;
```

```
                          NONLINEAR LEAST SQUARES
                          =======================

EQUATIONS: SDLFE0K

                                  CONSTANTS:

                 G110
VALUE          0.50000

                Log of Likelihood Function =     52.8240
                    Number of Observations =     23

                         Standard
Parameter  Estimate        Error       t-statistic
G120       -.610164      .144325       -4.22771
G130       -.038815      .034562       -1.12305
ALFAF10    -.174912      .090982       -1.92249
D10        -.064648      .101055       -.639732
BETA10     -2.29437      1.01605       -2.25814
K10        11.1100       .090392       122.909

Standard Errors computed from   quadratic form of analytic first
derivatives (Gauss)

                             Equation    SDLFE0K
                             ====================

Dependent variable: DLFE0K

 Mean of dependent variable = .042476        Std. error of regression = .028311
Std. dev. of dependent var. = .034959                     R-squared = .497987
   Sum of squared residuals = .013626              Adjusted R-squared = .350336
      Variance of residuals = .801532E-03     Durbin-Watson statistic = 2.42394
```

Bilag 3. Estimationsoutput - Sitc 2

Estimationsligning;

```
FRML sdlpe2 dlpe2 =  g212*log(pwe2nv/pwe2nv(-1))
                    +g222*log(pee24(-1)/pee24(-2))
                    +alfap22*(log(pe2(-1)/pwe2w(-1))
                    -k22)  ;
FRML sdlfe2 dlfe2 =
         g112*log(fee24/fee24(-1))
        -(beta12*alfaf12)*(dlpe2 -log(pee24/pee24(-1)) )
        +g132*(d-d(-1))
        +alfaf12*(log(fe2(-1)*(1-am2e2(-1))/(fee24(-1)*(1+d12*d(-1))))
                    -beta12*log(pe2(-1)/pee24(-1))
                    -k12)
        -log((1-am2e2)/(1-am2e2(-1)));
```

```
                        NONLINEAR LEAST SQUARES
                        =======================

EQUATIONS: SDLFE2

                                  CONSTANTS:

              ALFAF12          G132           D12
VALUE         -0.15000       0.00000       0.00000


                 Log of Likelihood Function =     30.2336
                     Number of Observations =     24

                          Standard
Parameter  Estimate         Error       t-statistic
G112       .316085       .316267       .999422
BETA12     -1.42371      .886522       -1.60595
K12        9.09213       .323475       28.1077

Standard Errors computed from   quadratic form of analytic first
derivatives (Gauss)

                             Equation    SDLFE2
                             ==================

Dependent variable: DLFE2

 Mean of dependent variable = .032547        Std. error of regression = .073395
Std. dev. of dependent var. = .089905                  R-squared = .438277
   Sum of squared residuals = .113122             Adjusted R-squared = .384779
      Variance of residuals = .538676E-02     Durbin-Watson statistic = 2.03757
```