APPENDIX 9

Multicollinerarity Tests for Tobit Regressions

1. Variance Inflation Factors for the first period (2002-2005)

1.1. For the first DEA model

Variance Inflation Factors (CRSTE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.029205	13.14898	9.911435*
d1	0.059524	269.8835	32.62328
d2	0.001065	3.138255	1.344967***
eta	0.008505	2.616085	1.772612***
lk	0.137715	29.69475	23.05977
lk2	0.042381	22.05071	21.66864
totalassets	0.102478	54.59882	43.35566

(*Capital*, *d2* and *eta* are among variables that are passed for the multicollinerarity tests. Hence, to remedy for the multicollinerarity problem, the equation (7.1) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

Variance Inflation Factors (VRSTE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.022299	13.14898	9.911435*
d1	0.045448	269.8835	32.62328
d2	0.000813	3.138255	1.344967***
eta	0.006493	2.616085	1.772612***
lk	0.105149	29.69475	23.05977
lk2	0.032359	22.05071	21.66864
totalassets	0.078245	54.59882	43.35566

(*Capital*, *d2* and *eta* are among variables that are passed for the multicollinerarity tests. Hence, to remedy for the multicollinerarity problem, the equation (7.1) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

Variance Inflation Factors (SCALE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.005516	13.14898	9.911435*
d1	0.011242	269.8835	32.62328
d2	0.000201	3.138255	1.344967***
eta	0.001606	2.616085	1.772612***
lk	0.026010	29.69475	23.05977
lk2	0.008005	22.05071	21.66864
totalassets	0.019355	54.59882	43.35566

(*Capital*, *d2* and *eta* are among variables that are passed for the multicollinerarity tests. Hence, to remedy for the multicollinerarity problem, the equation (7.1) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

1.2. For the Second DEA model

Variance Inflation Factors (CRSTE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.089911	13.17541	9.852214*
d1	0.185022	256.4783	32.80536
d2	0.003540	3.205825	1.379250***
eta	0.026433	2.641333	1.782381***
lk	0.430153	29.91863	23.47712
lk2	0.132235	22.43621	22.03375
totalassets	0.319116	55.40538	43.59734

(*Capital*, *d2* and *eta* are among variables that are passed for the multicollinerarity tests. Hence, to remedy for the multicollinerarity problem, the equation (7.1) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

Variance Inflation Factors (VRSTE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.094122	13.17541	9.852214*
d1	0.193688	256.4783	32.80536
d2	0.003706	3.205825	1.379250***
eta	0.027672	2.641333	1.782381***
lk	0.450302	29.91863	23.47712
lk2	0.138429	22.43621	22.03375
totalassets	0.334063	55.40538	43.59734

(*Capital*, *d2* and *eta* are among variables that are passed for the multicollinerarity tests. Hence, to remedy for the multicollinerarity problem, the equation (7.1) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

Variance Inflation Factors (SCALE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.036428	13.17541	9.852214*
d1	0.074963	256.4783	32.80536
d2	0.001434	3.205825	1.379250***
eta	0.010710	2.641333	1.782381***
lk	0.174281	29.91863	23.47712
lk2	0.053576	22.43621	22.03375
totalassets	0.129293	55.40538	43.59734

(*Capital*, *d2* and *eta* are among variables that are passed for the multicollinerarity tests. Hence, to remedy for the multicollinerarity problem, the equation (7.1) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

2. Variance Inflation Factors for the second period (2006-2012)

2.1. For the first DEA model

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.049651	9.300678	5.937336*
d1	0.007119	2.199587	1.895777***
d2	0.002035	1.735215	1.073724***
eta	0.036714	2.958427	1.255789***
pk	0.489254	11.53102	6.691426*
pk2	2.912166	6.475867	5.752766*
totalassets	0.069676	10.02604	7.320088*

(The entire variables are passed for the multicollinerarity tests. However, due to the censored characteristics of those variables, the equation (7.2) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

Variance Inflation Factors (VRSTE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.046884	9.300678	5.937336*
d1	0.006722	2.199587	1.895777*
d2	0.001921	1.735215	1.073724*
eta	0.034668	2.958427	1.255789*
pk	0.461986	11.53102	6.691426*
pk2	2.749862	6.475867	5.752766*
totalassets	0.065793	10.02604	7.320088*

(The entire variables are passed for the multicollinerarity tests. However, due to the censored characteristics of those variables, the equation (7.2) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

Variance Inflation Factors (SCALE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.025407	9.300678	5.937336*
d1	0.003643	2.199587	1.895777***
d2	0.001041	1.735215	1.073724***
eta	0.018787	2.958427	1.255789***
pk	0.250358	11.53102	6.691426*
pk2	1.490199	6.475867	5.752766*
totalassets	0.035654	10.02604	7.320088*

(The entire variables are passed for the multicollinerarity tests. However, due to the censored characteristics of those variables, the equation (7.2) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

2.2. For the second DEA model

Variance Inflation Factors (CRSTE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.052318	9.226143	5.847633*
d1	0.007661	2.219585	1.914697***
d2	0.002135	1.805760	1.081471***
eta	0.039640	2.980591	1.266486***
pk	0.515593	11.92090	6.918262*
pk2	3.123918	6.792167	6.000383*
totalassets	0.073569	9.955515	7.236179*

(The entire variables are passed for the multicollinerarity tests. However, due to the censored characteristics of those variables, the equation (7.2) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

Variance Inflation Factors (VRSTE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.051887	9.226143	5.847633*
d1	0.007598	2.219585	1.914697***
d2	0.002117	1.805760	1.081471***
eta	0.039313	2.980591	1.266486***
pk	0.511344	11.92090	6.918262*
pk2	3.098175	6.792167	6.000383*
totalassets	0.072962	9.955515	7.236179*

(The entire variables are passed for the multicollinerarity tests. However, due to the censored characteristics of those variables, the equation (7.2) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)

Variance Inflation Factors (SCALE)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Capital	0.029639	9.226143	5.847633*
d1	0.004340	2.219585	1.914697***
d2	0.001209	1.805760	1.081471***
eta	0.022456	2.980591	1.266486***
pk	0.292089	11.92090	6.918262*
pk2	1.769734	6.792167	6.000383*
totalassets	0.041677	9.955515	7.236179*

(The entire variables are passed for the multicollinerarity tests. However, due to the censored characteristics of those variables, the equation (7.2) is run by the ML - Censored Normal (TOBIT) (Quadratic hill climbing) rather than the OLS method)