The data file CY6\_MS\_CMB\_STU\_QQQ is downloadble from <http://vs-web-fs-1.oecd.org/pisa/PUF_SPSS_COMBINED_CMB_STU_QQQ.zip> and comes in SPSS (.sav) format. This can be changed to Stata format (.dta) using stattransfer.

use "C:\Users\ecagj\PISA\CY6\_MS\_CMB\_STU\_QQQ.DTA"

keep cntryid cnt cntschid Region stratum subnatio age outhours ST013Q01TA ST061Q01NA ST059Q01TA ST059Q02TA ST059Q03TA escs hisced homepos wealth PV1MATH PV1SCIE PV1READ

drop if age==.|outhours==.|ST061Q01NA==.|ST059Q01TA==.|ST059Q02TA==.|ST059Q03TA==.|escs==.|hisced==.|homepos==.|wealth==.|PV1MATH==.|PV1SCIE==.|PV1READ==.|Region==.

keep if Region==82611|Region==82613

g books=0

replace books=5 if ST013Q01TA==1

replace books=18 if ST013Q01TA==2

replace books=63 if ST013Q01TA==3

replace books=150 if ST013Q01TA==4

replace books=350 if ST013Q01TA==5

replace books=500 if ST013Q01TA==6

g classmath=ST061Q01NA\*ST059Q02TA

g classsci=ST061Q01NA\*ST059Q03TA

g classread=ST061Q01NA\*ST059Q01TA

replace escs=escs+10

replace wealth=wealth+10

g dmu=\_n

set matsize 11000

save "C:\Users\ecagj\PISA\working.DTA"

keep if Region==82613

dea age books classmath classsci classread outhours escs homepos wealth = PV1MATH PV1READ PV1SCIE, rts(vrs) ort(out)

use "C:\Users\ecagj\PISA\working.DTA" , replace

keep if Region==82611

dea age books classmath classsci classread outhours escs homepos wealth = PV1MATH PV1READ PV1SCIE, rts(vrs) ort(out)

use "C:\Users\ecagj\PISA\working.DTA" , replace

dea age books classmath classsci classread outhours escs homepos wealth = PV1MATH PV1READ PV1SCIE, rts(vrs) ort(out)

It turns out that the stata code is too inefficient to run on a PC – so in practice we use stattransfer to convert the working.DTA file to limdep and then use the following limdep code to calculate the (VRS, output-oriented) efficiencies.

load;file=C:\Users\ecagj\PISA\working.lpj$

skip$

frontier;lhs=PV1MATH,PV1SCIE,PV1READ;rhs=AGE,OUTHOURS,WEALTH,ESCS,HOMEPOS,BOOKS,CLASSMAT,CLASSSCI,CLASSREA;alg=DEA$

create;effsall=DEAEFF\_O$

list;DMU,effsall$

save;file=C:\Users\ecagj\PISA\working1.lpj$

reject;Region=82611$

frontier;lhs=PV1MATH,PV1SCIE,PV1READ;rhs=AGE,OUTHOURS,WEALTH,ESCS,HOMEPOS,BOOKS,CLASSMAT,CLASSSCI,CLASSREA;alg=DEA$

create;effswal=DEAEFF\_O$

list;DMU,effswal$

load;file=C:\Users\ecagj\PISA\working1.lpj$

reject;Region=82613$

frontier;lhs=PV1MATH,PV1SCIE,PV1READ;rhs=AGE,OUTHOURS,WEALTH,ESCS,HOMEPOS,BOOKS,CLASSMAT,CLASSSCI,CLASSREA;alg=DEA$

create;effseng=DEAEFF\_O$

list;DMU,effseng$

stop$

stop$

Copying the efficiencies into an excel file then allows the overall, Wales and England specific efficiencies to be calculated routinely for each pupil, and hence allows averages to be constructed. Using stattransfer to convert these excel files to stata and then running the following code gives the averages reported in the paper:

use "\\LANCS\homes\58\ecagj\My Desktop\all.dta"

merge 1:1 dmu using "\\LANCS\homes\58\ecagj\My Desktop\eng.dta"

drop \_merge

merge 1:1 dmu using "\\LANCS\homes\58\ecagj\My Desktop\wal.dta"

drop \_merge

save "C:\Users\ecagj\PISA\efficiencies.dta"

merge 1:1 dmu using "C:\Users\ecagj\PISA\working.DTA"

save "C:\Users\ecagj\PISA\efficiencies.dta", replace

summarize wealth escs

summarize effsall

summarize effswal

summarize effseng

g cwallc=0

replace cwallc=effsall/effswal if Region==82613

replace cwallc=effsall/effseng if Region==82611

summarize cwallc

summarize cwallc if Region==82613

summarize cwallc if Region==82611

summarize cwallc if Region==82613&wealth>=10.54762

summarize cwallc if Region==82613&wealth<10.54762

summarize cwallc if Region==82611&wealth<10.54762

summarize cwallc if Region==82611&wealth>=10.54762

summarize effswal if wealth>=10.54762

summarize effswal if wealth<10.54762

summarize effseng if wealth<10.54762

summarize effseng if wealth>=10.54762

summarize cwallc if Region==82613&escs>=10.28352

summarize cwallc if Region==82613&escs<10.28352

summarize cwallc if Region==82611&escs<10.28352

summarize cwallc if Region==82611&escs>=10.28352

summarize effswal if escs>=10.28352

summarize effswal if escs<10.28352

summarize effseng if escs<10.28352

summarize effseng if escs>=10.28352

centile wealth, centile(10,25,50,75,90)

summarize cwallc if Region==82613&wealth>=9.43143

summarize cwallc if Region==82613&wealth<9.43143

summarize cwallc if Region==82611&wealth<9.43143

summarize effswal if Region==82611&wealth<9.43143

summarize effswal if Region==82613&wealth<9.43143

summarize effseng if Region==82611&wealth<9.43143

centile escs, centile(10,25,50,75,90)

summarize cwallc if Region==82613&escs<9.11567

summarize cwallc if Region==82611&wealth>=9.43143

summarize effseng if Region==82611&wealth>=9.43143

summarize effswal if Region==82613&wealth>=9.43143