

Estimation

//STATA do file

set more off

```
////////////////////////////////////  
////////////////////////////////////  
//////////////////////////////////// GINI  
REGRESSIONS////////////////////////////////////  
////////////////////////////////////  
////////////////////////////////////
```

//MACROS

```
global contr_disposable trans_totalvimb_corr_pcgdp gg_soc_benef_curr_pc  
pers_tax_pcgdp kakwani_tax unemp h emp_prot_regular union_density urb  
trade wgi_effective  
global contr_before unemp h emp_prot_regular union_density urb trade  
wgi_effective
```

```
////////////////////////////////////  
////////////////////////////////////  
///*****Disposable income Gini as dependent  
variable*****  
////////////////////////////////////  
////////////////////////////////////
```

```
////////////////////////////////////Disposable Gini specification I: Baseline fixed  
effects////////////////////////////////////  
///*****  
*****
```

// Regression diagnostics

```
/**Hausman test for FE vs. RE specification**  
// if Prob>chi2 < 0.05, use fixed effects  
quietly xtreg gini_disp_yearly rev_share $contr_disposable i.year, fe  
estimate store FE11ab  
quietly xtreg gini_disp_yearly rev_share $contr_disposable i.year, re  
estimate store RE11ab  
hausman FE11ab RE11ab, sigmamore
```

```
quietly xtreg gini_disp_yearly tax_share $contr_disposable i.year, fe  
estimate store FE12ab  
quietly xtreg gini_disp_yearly tax_share $contr_disposable i.year, re  
estimate store RE12ab  
hausman FE12ab RE12ab, sigmamore
```

```
quietly xtreg gini_disp_yearly exp_share $contr_disposable i.year, fe  
estimate store FE13ab  
quietly xtreg gini_disp_yearly exp_share $contr_disposable i.year, re  
estimate store RE13ab  
hausman FE13ab RE13ab, sigmamore
```

```
quietly xtreg gini_disp_yearly i_tax_aut $contr_disposable i.year, fe  
estimate store FE14ab  
quietly xtreg gini_disp_yearly i_tax_aut $contr_disposable i.year, re  
estimate store RE14ab  
hausman FE14ab RE14ab, sigmamore
```

```

/**test for heteroskedasticity**
// if Prob>chi2 < 0.05, presence of heteroskedasticity
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
quietly xtreg gini_disp_yearly `v' $contr_disposable i.year, fe
xttest3
}

/**test for serial correlation**
// if Prob>F < 0.05, presence of serial correlation
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
xtserial gini_disp_yearly `v' $contr_disposable
}

/**test for multicollinearity**
// if VIF < 10 for all variables, should be ok
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
collin `v' $contr_disposable
corr `v' $contr_disposable
}

/**test for time-fixed effects**
// if Prob>F > 0.05, no time fixed-effects are needed
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
quietly xtreg gini_disp_yearly `v' $contr_disposable i.year, fe
testparm i.year
}

// FE regressions
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
xi: xtreg gini_disp_yearly `v' $contr_disposable i.year, fe ro
}

//////////Disposable Gini specification II: IV 2SLS with lagged
independent variable//////////
//*****
*****
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
xi: xtivreg2 gini_disp_yearly (`v'=1(1/2).`v') $contr_disposable i.year,
fe ro ffirst endog(`v') liml
}

//////////Disposable Gini specification III: XTSCC
regression to control for cross-sectional dependence
//////////
//*****
*****
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
xtscc gini_disp_yearly `v' $contr_disposable, fe
}

```

```

//////////Disposable Gini specification IV: Interactions with policy
variables //////////
//*****
*****
// interaction with kakwani
xi: xtreg gini_disp_yearly rev_share kakwaniXrevshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly tax_share kakwaniXtaxshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly exp_share kakwaniXexpshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly educ_ratio kakwaniXeduc_ratio
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly soc_prot_ratio kakwaniXsocprotratio
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly i_tax_aut kakwaniXitaxaut $contr_disposable
i.year, fe ro

// interaction with individual benefits
xi: xtreg gini_disp_yearly rev_share indbenXrevshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly tax_share indbenXtaxshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly exp_share indbenXexpshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly educ_ratio indbenXeducratio $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly soc_prot_ratio indbenXsocprotratio
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly i_tax_aut indbenXitaxaut $contr_disposable
i.year, fe ro

// interaction with taxes
xi: xtreg gini_disp_yearly rev_share perstaxXrevshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly tax_share perstaxXtaxshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly exp_share perstaxXexpshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly educ_ratio perstaxXeducratio $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly soc_prot_ratio perstaxXsocprotratio
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly i_tax_aut perstaxXitaxaut $contr_disposable
i.year, fe ro

// interaction with interregional transfers
xi: xtreg gini_disp_yearly rev_share regtransXrevshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly tax_share regtransXtaxshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly exp_share regtransXexpshare $contr_disposable
i.year, fe ro
xi: xtreg gini_disp_yearly educ_ratio regtransXeducratio
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly soc_prot_ratio regtransXsocprotratio
$contr_disposable i.year, fe ro

```

```

xi: xtreg gini_disp_yearly i_tax_aut regtransXitaxaut $contr_disposable
i.year, fe ro

// interaction with gov effectiveness
xi: xtreg gini_disp_yearly rev_share effectiveXrev_share
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly tax_share effectiveXtax_share
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly exp_share effectiveXexp_share
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly educ_ratio effectiveXeduc_ratio
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly soc_prot_ratio effectiveXsoc_prot_ratio
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly i_tax_aut effectiveXtax_aut $contr_disposable
i.year, fe ro

// interaction with gov size
xi: xtreg gini_disp_yearly rev_share gg_total govsizeXrev_share
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly tax_share gg_total govsizeXtax_share
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly exp_share gg_total govsizeXexp_share
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly educ_ratio gg_total govsizeXeducratio
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly soc_prot_ratio gg_total govsizeXsocprotratio
$contr_disposable i.year, fe ro
xi: xtreg gini_disp_yearly i_tax_aut gg_total govsizeXitaxaut
$contr_disposable i.year, fe ro

////Market Gini regressions
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
xi: xtreg gini_before_yearly `v' $contr_before i.year, fe ro
}

// adding population into the baseline
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
xi: xtreg gini_disp_yearly `v' $contr_disposable pop i.year, fe ro
}

////////////////////////////////////
////////////////////////////////////
//////////////////////////////////// Income decile
regressions////////////////////////////////////
////////////////////////////////////
////////////////////////////////////

//rev share
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtreg `v' rev_share $contr_disposable i.year, fe ro
}

```

```

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtivreg2 `v' (rev_share=1(1/2).rev_share) $contr_disposable i.year,
fe ro ffirst liml endog(rev_share)
}

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xtscc `v' rev_share $contr_disposable, fe
}

//tax share
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtreg `v' tax_share $contr_disposable i.year, fe ro
}

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtivreg2 `v' (tax_share=1(1/2).tax_share) $contr_disposable i.year,
fe ro ffirst liml endog(tax_share)
}

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xtscc `v' tax_share $contr_disposable, fe
}

//exp share
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtreg `v' exp_share $contr_disposable i.year, fe ro
}

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtivreg2 `v' (exp_share =1(1/2).exp_share ) $contr_disposable i.year,
fe ro ffirst liml endog(exp_share )
}

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xtscc `v' exp_share $contr_disposable, fe
}

//educ_ratio
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtreg `v' educ_ratio $contr_disposable i.year, fe ro
}

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtivreg2 `v' (educ_ratio =1(1/2).educ_ratio ) $contr_disposable
i.year, fe ro ffirst liml endog(educ_ratio )
}

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xtscc `v' educ_ratio $contr_disposable, fe
}

```

```
}
```

```
//soc_prot_ratio
```

```
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50  
p90p50 p90p10{  
xi: xtreg `v' soc_prot_ratio $contr_disposable i.year, fe ro  
}
```

```
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50  
p90p50 p90p10{  
xi: xtivreg2 `v' (soc_prot_ratio =1(1/2).soc_prot_ratio )  
$contr_disposable i.year, fe ro ffirst liml endog(soc_prot_ratio )  
}
```

```
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50  
p90p50 p90p10{  
xtscc `v' soc_prot_ratio $contr_disposable, fe  
}
```

```
//tax autonomy
```

```
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50  
p90p50 p90p10{  
xi: xtreg `v' i_tax_aut $contr_disposable i.year, fe ro  
}
```

```
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50  
p90p50 p90p10{  
xi: xtivreg2 `v' (i_tax_aut=1(1/2).i_tax_aut) $contr_disposable i.year,  
fe ro ffirst liml endog(i_tax_aut)  
}
```

```
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50  
p90p50 p90p10{  
xtscc `v' i_tax_aut $contr_disposable, fe  
}
```

```
//income tax ratio
```

```
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50  
p90p50 p90p10{  
xi: xtreg `v' inc_tax_ratio $contr_disposable i.year, fe ro  
}
```

```
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50  
p90p50 p90p10{  
xi: xtivreg2 `v' (inc_tax_ratio=1(1/2).inc_tax_ratio) $contr_disposable  
i.year, fe ro ffirst liml endog(inc_tax_ratio)  
}
```

```
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50  
p90p50 p90p10{  
xtscc `v' inc_tax_ratio $contr_disposable, fe  
}
```

```
//property tax ratio
```

```
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50  
p90p50 p90p10{  
xi: xtreg `v' prop_tax_ratio $contr_disposable i.year, fe ro  
}
```

```

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtivreg2 `v' (prop_tax_ratio=l(1/2).prop_tax_ratio) $contr_disposable
i.year, fe ro ffirst liml endog(prop_tax_ratio)
}

```

```

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xtscc `v' prop_tax_ratio $contr_disposable, fe
}

```

```

//economic spending ratio
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtreg `v' eco_ratio $contr_disposable i.year, fe ro
}

```

```

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtivreg2 `v' (eco_ratio=l(1/2).eco_ratio) $contr_disposable i.year,
fe ro ffirst liml endog(eco_ratio)
}

```

```

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xtscc `v' eco_ratio $contr_disposable, fe
}

```

```

//health ratio
foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtreg `v' health_ratio $contr_disposable i.year, fe ro
}

```

```

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xi: xtivreg2 `v' (health_ratio=l(1/2).health_ratio) $contr_disposable
i.year, fe ro ffirst liml endog(health_ratio)
}

```

```

foreach v of varlist p50p10 p50p20 p50p30 p50p40 p60p50 p70p50 p80p50
p90p50 p90p10{
xtscc `v' health_ratio $contr_disposable, fe
}

```

```

/**Hausman test for FE vs. RE specification**
// if Prob>chi2 < 0.05, use fixed effects
quietly xtreg p90p50 rev_share $contr_disposable i.year, fe
estimate store FE1lab
quietly xtreg p90p50 rev_share $contr_disposable i.year, re
estimate store RE1lab
hausman FE1lab RE1lab, sigmamore

```

```

quietly xtreg p90p50 tax_share $contr_disposable i.year, fe
estimate store FE12ab
quietly xtreg p90p50 tax_share $contr_disposable i.year, re

```

```

estimate store RE12ab
hausman FE12ab RE12ab, sigmamore

quietly xtreg p90p50 exp_share $contr_disposable i.year, fe
estimate store FE13ab
quietly xtreg p90p50 exp_share $contr_disposable i.year, re
estimate store RE13ab
hausman FE13ab RE13ab, sigmamore

quietly xtreg p90p50 i_tax_aut $contr_disposable i.year, fe
estimate store FE14ab
quietly xtreg p90p50 i_tax_aut $contr_disposable i.year, re
estimate store RE14ab
hausman FE14ab RE14ab, sigmamore

/**test for heteroskedasticity**
// if Prob>chi2 < 0.05, presence of heteroskedasticity
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
quietly xtreg p90p50 `v' $contr_disposable i.year, fe
xtttest3
}

/**test for serial correlation**
// if Prob>F < 0.05, presence of serial correlation
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
xtserial p90p50 `v' $contr_disposable
}

/**test for multicollinearity**
// if VIF < 10 for all variables, should be ok
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
collin `v' $contr_disposable
corr `v' $contr_disposable
}

/**test for time-fixed effects**
// if Prob>F > 0.05, no time fixed-effects are needed
foreach v of varlist rev_share tax_share exp_share i_tax_aut educ_ratio
soc_prot_ratio health_ratio eco_ratio inc_tax_ratio prop_tax_ratio {
quietly xtreg p90p50 `v' $contr_disposable i.year, fe
testparm i.year
}

```