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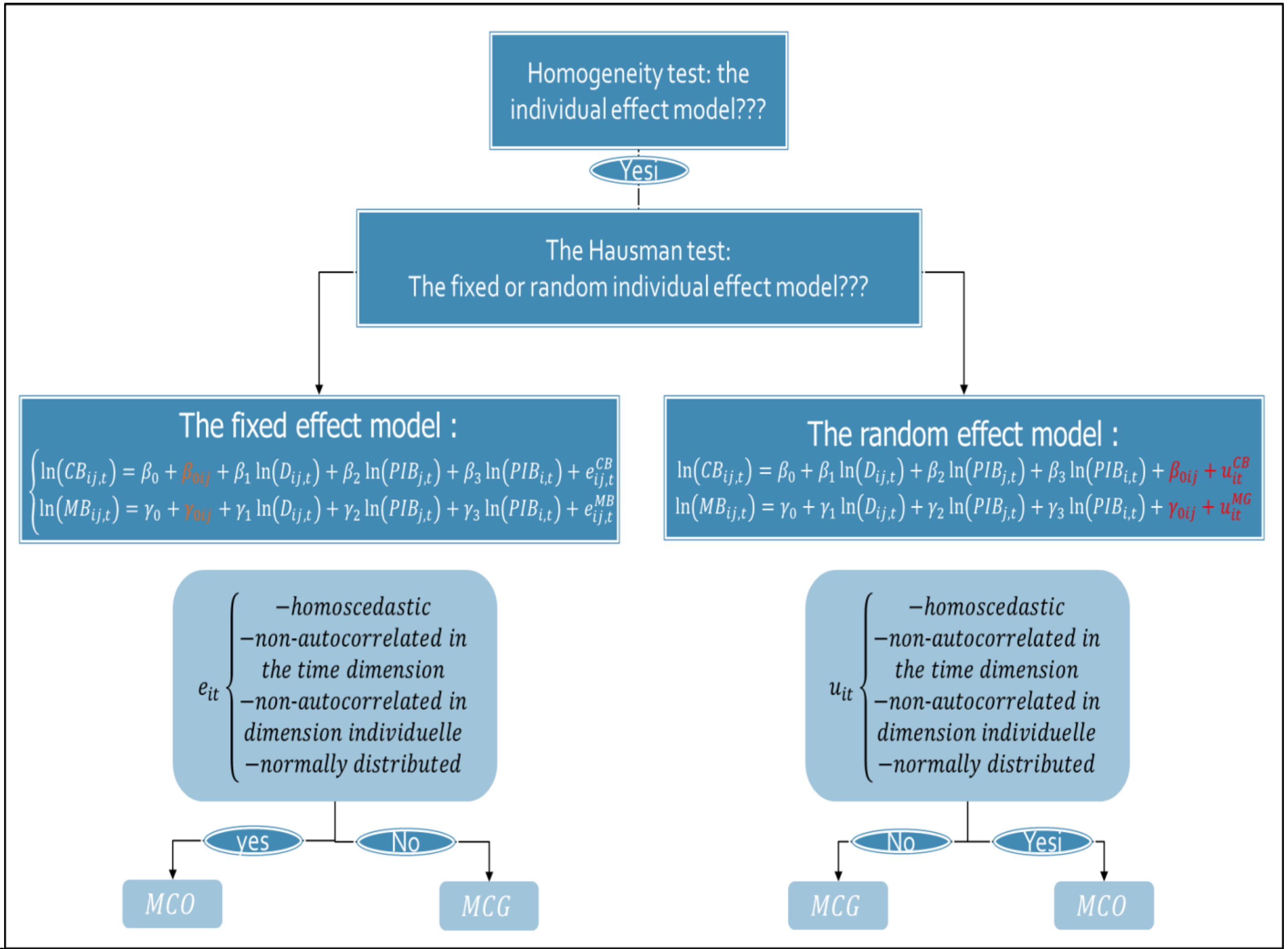
APPENDIX

Appendix 1: Estimation Scheme in the Case of Panel Data



Source: Authors

Appendix 2: Tests and Results of the Gravity Model.

Figure 1: Honda Test for the Presence of Individual-Specific Effects

```
> library("zoo")
> library("lmtest")
> library("collapse")
> library("plm")
> library(readxl)
> stata1 <- read_excel("C:/Users/lenovo/Desktop/MEGC_ PFE/mo.grv/exl/stata1.xlsx")
> View(stata1)
> pdata=pdata.frame(stata1,index=c("i","t"))
> ea=plm(lnX~lngdp_d+lngdp_o+lnpop_o+lnpop_d+lndistcap+comlang_off+contig+comcol+LC+LT+TC+LTC,data=
pdata,model="random")
> plmtest(ea,effect='individual',type="honda")

        Lagrange Multiplier Test - (Honda)

data:  lnX ~ lngdp_d + lngdp_o + lnpop_o + lnpop_d + lndistcap + comlang_off +  ...
normal = 270.23, p-value < 2.2e-16
alternative hypothesis: significant effects

> ef=plm(lnX~lngdp_d+lngdp_o+lnpop_o+lnpop_d+lndistcap+comlang_off+contig+comcol+LC+LT+TC+LTC,data=
pdata,effect="individual",model="within")
> plmtest(ef,effect='individual',type="honda")

        Lagrange Multiplier Test - (Honda)

data:  lnX ~ lngdp_d + lngdp_o + lnpop_o + lnpop_d + lndistcap + comlang_off +  ...
normal = 270.23, p-value < 2.2e-16
alternative hypothesis: significant effects
> ef_M=plm(lnM~lngdp_d+lngdp_o+lnpop_o+lnpop_d+lndistcap+comlang_off+contig+comcol+LC+LT+TC+LTC,data=
pdata,model="within")
> plmtest(ef_M,effect='individual',type="honda")

        Lagrange Multiplier Test - (Honda)

data:  lnM ~ lngdp_d + lngdp_o + lnpop_o + lnpop_d + lndistcap + comlang_off +  ...
normal = 301.29, p-value < 2.2e-16
alternative hypothesis: significant effects

> ea_M=plm(lnM~lngdp_d+lngdp_o+lnpop_o+lnpop_d+lndistcap+comlang_off+contig+comcol+LC+LT+TC+LTC,data=
pdata,model="random")
> plmtest(ea_M,effect='individual',type="honda")

        Lagrange Multiplier Test - (Honda)

data:  lnM ~ lngdp_d + lngdp_o + lnpop_o + lnpop_d + lndistcap + comlang_off +  ...
normal = 301.29, p-value < 2.2e-16
alternative hypothesis: significant effects
```

Source: Created by the author using RStudio

Figure 2: Hausman Specification Test for the Export Model.

```
. hausman eff eaa

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |      eff          eaa         Difference          S.E.
-------------+----------------------------------------------------------------
    lngdp_o  |    .5400377      .662877       -.1228393        .0347618
    lngdp_d  |    .5789934     .3936314         .185362         .031544
    lnpop_d  |   -.4068223     .0445366       -.4513588        .1555883
    lnpop_o  |     .020008     .1508386       -.1308306        .1608753
  lndistcap  |   -3.169698    -1.476537       -1.693161        4.578373
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =      158.30
                Prob>chi2 =      0.0000
. hausman eff eaa

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |      eff          eaa         Difference          S.E.
-------------+----------------------------------------------------------------
    lngdp_o  |     .506448     .6071797       -.1007316        .0303035
    lngdp_d  |    .5851633     .3739381        .2112251        .0299715
    lnpop_o  |   -.3905584     .0117959       -.4023543        .1480649
    lnpop_d  |   -.1000225     .2552789       -.3553014        .1464065
  lndistcap  |    6.722367    -1.369673         8.09204        4.725037
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =      215.10
                Prob>chi2 =      0.0000
```

Source: Created by the author using Stata 14

Figure 3: Results of the Jarque-Bera Normality Test

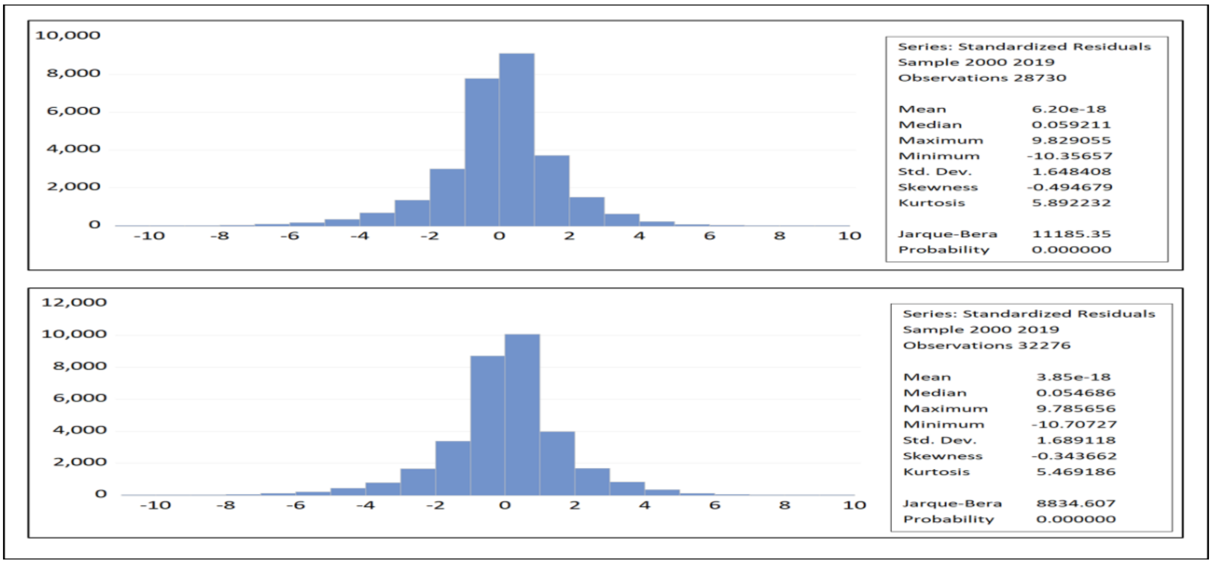


Figure 4: Results of the Homoscedasticity Test.

```
> pdata=pdata.frame(stata1,index=c("i","t"))
> bptest_M=bptest(lnM~lngdp_d+lngdp_o+lnpop_o+lnpop_d+lndistcap,data=pdata,studentize=F)
> bptest_M

        Breusch-Pagan test

data:  lnM ~ lngdp_d + lngdp_o + lnpop_o + lnpop_d + lndistcap
BP = 168.97, df = 5, p-value < 2.2e-16

> bptest_X=bptest(lnX~lngdp_d+lngdp_o+lnpop_o+lnpop_d+lndistcap,data=pdata,studentize=F)
> bptest_X

        Breusch-Pagan test

data:  lnX ~ lngdp_d + lngdp_o + lnpop_o + lnpop_d + lndistcap
BP = 190.43, df = 5, p-value < 2.2e-16
```

Source: Created by the author using RStudio

Figure 5: Results of the Autocorrelation Test (Intra-Individual Correlation)

```
> library("dplyr")
> pdata=pdata.frame(stata1,index=c("i","t"))
> ef_M=plm(lnM~lngdp_d+lngdp_o+lnpop_o+lnpop_d+lndistcap+comlang_off+contig+comcol+LC+LT+TC+LTC,data=
pdata,model="within")
> pbgtest(ef_M,order=1)

        Breusch-Godfrey/Wooldridge test for serial correlation in panel models

data:  lnM ~ lngdp_d + lngdp_o + lnpop_o + lnpop_d + lndistcap + comlang_off +  ...
chisq = 1742.1, df = 1, p-value < 2.2e-16
alternative hypothesis: serial correlation in idiosyncratic errors

> ef_X=plm(lnX~lngdp_d+lngdp_o+lnpop_o+lnpop_d+lndistcap+comlang_off+contig+comcol+LC+LT+TC+LTC,data=
pdata,model="within")
> pbgtest(ef_X,order=1)

        Breusch-Godfrey/Wooldridge test for serial correlation in panel models

data:  lnX ~ lngdp_d + lngdp_o + lnpop_o + lnpop_d + lndistcap + comlang_off +  ...
chisq = 1259.5, df = 1, p-value < 2.2e-16
alternative hypothesis: serial correlation in idiosyncratic errors
```

Source: Created by the author using RStudio

Figure 6: Estimation of the Export Gravity Model Using PPML and GCE Methods.

Estimateurs PPML de modèle d'exportation

```
Number of parameters: 13
Number of observations: 51831
Pseudo log-likelihood: -1.442e+09
R-squared: .2743858
Option strict is: off
```

X	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
lngdp_o	.8326269	.0322059	25.85	0.000	.7695046	.8957493
lngdp_d	.6895954	.0283285	24.34	0.000	.6340726	.7451182
lnpop_o	-.0334994	.0332011	-1.01	0.313	-.0985724	.0315736
lnpop_d	-.0980054	.0264955	-3.70	0.000	-.1499357	-.0460751
lndistcap	-.6287934	.0383567	-16.39	0.000	-.7039711	-.5536156
contig	1.756888	.1138298	15.43	0.000	1.533785	1.97999
comlang_off	.9351965	.0864736	10.81	0.000	.7657114	1.104682
comcol	-.8620772	.2138704	-4.03	0.000	-1.281255	-.4428989
LC	.2034644	.2326599	0.87	0.382	-.2525406	.6594693
LT	-.9799638	.1376319	-7.12	0.000	-1.249717	-.7102101
TC	-.3102018	.295336	-1.05	0.294	-.8890498	.2686461
LTC	.7641886	.3203652	2.39	0.017	.1362843	1.392093
_cons	-10.37456	.4763715	-21.78	0.000	-11.30823	-9.440893

Estimateurs MCG de modèle d'exportation

```
> library("zoo")
> library("lmtest")
> library("collapse")
> library("plm")
> pdata=pdata.frame(stata1,index=c("i","t"))
> ef_fgls=pggls(lnX~lngdp_d+lngdp_o+lnpop_o+lnpop_d+lndistcap+comlang_off+contig+comcol+LC+LT+TC+LTC,data=pda
ta,effect="individual",model="within")
> summary(ef_fgls)
Oneway (individual) effect Within FGLS model

Call:
pggls(formula = lnX ~ lngdp_d + lngdp_o + lnpop_o + lnpop_d +
    lndistcap + comlang_off + contig + comcol + LC + LT + TC +
    LTC, data = pdata, effect = "individual", model = "within")

Unbalanced Panel: n = 2464, T = 1-20, N = 28730

Residuals:
        Min.      1st Qu.       Median      3rd Qu.         Max.
-10.39658278  -0.71840373   0.05498876   0.83139504   9.96160112

Coefficients:
           Estimate Std. Error  z-value  Pr(>|z|)
lngdp_d    1.063381   0.032864  32.3566 < 2.2e-16 ***
lngdp_o    0.460704   0.035394  13.0165 < 2.2e-16 ***
lnpop_o   -0.791232   0.120411  -6.5711 4.995e-11 ***
lnpop_d   -1.231323   0.118155 -10.4213 < 2.2e-16 ***
lndistcap -9.303864   1.165783  -7.9808 1.454e-15 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Total Sum of Squares: 385610
Residual Sum of Squares: 78555
Multiple R-squared: 0.79628
```

Source: Created by the author using RStudio and Stata.

Figure 7: Estimation of the Import Gravity Model Using PPML and GCE Methods.

Estimateurs MCG de modèled'importation

```
> ef_fgls_M=pggls(lnM~lngdp_d+lngdp_o+lnpop_o+lnpop_d+lndistcap+comlang_off+contig+comcol+LC+LT+TC+LTC,data=p
data,effect="individual",model="within")
> summary(ef_fgls_M)
Oneway (individual) effect Within FGLS model

Call:
pggls(formula = lnM ~ lngdp_d + lngdp_o + lnpop_o + lnpop_d +
    lndistcap + comlang_off + contig + comcol + LC + LT + TC +
    LTC, data = pdata, effect = "individual", model = "within")

Unbalanced Panel: n = 2543, T = 1-20, N = 32276

Residuals:
       Min.     1st Qu.      Median     3rd Qu.        Max.
-10.5969704  -0.7428380   0.0580667   0.8242857   9.8864732

Coefficients:
           Estimate Std. Error z-value Pr(>|z|)
lngdp_d    0.570378   0.042094 13.5502  < 2e-16 ***
lngdp_o    0.087716   0.042341  2.0717  0.03830 *
lnpop_o   -0.401067   0.166224 -2.4128  0.01583 *
lnpop_d    1.103940   0.169129  6.5272  6.7e-11 ***
lndistcap  8.044253   3.123366  2.5755  0.01001 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Total Sum of Squares: 445480
Residual Sum of Squares: 92651
Multiple R-squared: 0.79202
```

Estimateurs PPML de modèle d'importation

```
Number of parameters: 13
Number of observations: 51831
Pseudo log-likelihood: -1.275e+09
R-squared: .40102507
Option strict is: off
```

M	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
lngdp_o	1.089554	.0273575	39.83	0.000	1.035935	1.143174
lngdp_d	.4839995	.0268958	18.00	0.000	.4312848	.5367142
lnpop_o	-.2272157	.0286461	-7.93	0.000	-.2833611	-.1710704
lnpop_d	-.0726517	.0243247	-2.99	0.003	-.1203272	-.0249762
lndistcap	-.6443683	.0372988	-17.28	0.000	-.7174727	-.571264
contig	1.502592	.1196268	12.56	0.000	1.268128	1.737056
comlang_off	.9133916	.0841361	10.86	0.000	.7484879	1.078295
comcol	-.3300186	.1535073	-2.15	0.032	-.6308874	-.0291498
LC	-.4352708	.1697803	-2.56	0.010	-.768034	-.1025076
LT	-.66188	.1298387	-5.10	0.000	-.9163593	-.4074007
TC	-.8230813	.2656735	-3.10	0.002	-1.343792	-.3023708
LTC	1.508351	.2838754	5.31	0.000	.951965	2.064736
_cons	-9.650814	.5263869	-18.33	0.000	-10.68251	-8.619115

Source: Created by the author using RStudio and Stata.

Appendix 3: List of ISO-3 Country Codes for African Countries Used in the Analysis.

Table 1: List of ISO-3 Country Codes for African Countries Used in the Analysis

ISO 3166-1 alpha-3	Country	ISO 3166-1 alpha-3	Country
DZA	Algeria	LBR	Liberia
AGO	Angola	LBY	Libya
BEN	Benin	MDG	Madagascar
BWA	Botswana	MWI	Malawi
BFA	Burkina Faso	MLI	Mali
BDI	Burundi	MRT	Mauritania
CPV	Cape Verde	MUS	Mauritius
CMR	Cameroon	MAR	Morocco
CAF	Central African Republic	MOZ	Mozambique
TCD	Chad	NAM	Namibia
COM	Comoros	NER	Niger
COG	Congo	NGA	Nigeria
CIV	Côte d'Ivoire	RWA	Rwanda
COD	Democratic Republic of the Congo	STP	São Tomé and Príncipe
DJI	Djibouti	SEN	Senegal
EGY	Egypt	SYC	Seychelles
GNQ	Equatorial Guinea	SLE	Sierra Leone
ERI	Eritrea	SOM	Somalia
SWZ	Eswatini	ZAF	South Africa
ETH	Ethiopia	SSD	South Sudan
GAB	Gabon	SDN	Sudan
GMB	Gambia	TGO	Togo
GHA	Ghana	TUN	Tunisia
GIN	Guinea	UGA	Uganda
GNB	Guinea-Bissau	TZA	Tanzania
KEN	Kenya	ZMB	Zambia
LSO	Lesotho	ZWE	Zimbabwe

Appendix 4

Equations to Add, modify (*), and Remove (**) from the PEP-1-1- Model

Table 10: Equations to Add, modify (*), and Remove (**) from the PEP-1-1- Model

The model equations		Endogenous variables	
Export EQ	318	v. Endogenous	318
$EX_{j,i} = B_{j,i}^{EX} * \left[\beta_{i,j}^{EX} * \left(EX_{j,i}^{AF}\right)^{\rho_{i,j}^{EX}} + \left(1-\beta_{j,i}^{EX}\right) * \left(EX_{j,i}^{RM}\right)^{\rho_{i,j}^{EX}}\right]^{\frac{1}{\rho_{j,i}^{EX}}}$	21	$EX_{j,i}^{RM}$	21
$EX_{j,i}^{AF} = \left[\frac{1-\beta_{j,i}^{EX}}{\beta E_{j,i}^{X}} * \frac{PE_i^{AF}}{PE_i^{RM}}\right]^{\sigma_{j,i}^{EX}} EX_{j,i}^{RM}$	21	$EX_{j,i}^{AF}$	21
$PE_i = \frac{PE_i^{AF} * EX_{j,i}^{AF} + PE_i^{RM} * EX_{j,i}^{RM}}{EX_{j,i}}$	21*	$EX_{j,i}$	21
$(PE_i^{FOB})^{AF} = (1 + ttix_i^{AF})\left[PE_i^{AF} + \sum_{ij} PC_{ij} * tmrg_{(ij,i)}^{X}\right]$	21	PE_i^{AF}	21
$(PE_i^{FOB})^{RM} = (1 + ttix_i^{RM})\left[PE_i^{RM} + \sum_{ij} PC_{ij} * tmrg_{(ij,i)}^{X}\right]$	21	PE_i^{RM}	21
$PE_i^{FOB} = \frac{(PE_i^{FOB})^{AF} * EXD_i^{AF} + (PE_i^{FOB})^{RM} * EXD_i^{RM}}{EXD_i}$	21*	EXD_i	21
$EXD_i^{AF} = [EXD_i^{AF}]^{O}\left[\frac{\mathrm{e} * PWX_i^{AF}(1 + [tmMM_i^{AF}]^{0})}{(PE_i^{FOB})^{AF}(1 + tmMM_i^{AF})}\right]^{\sigma_i^{EXD\_AF}}$	21	EXD_i^{AF}	21
$EXD_i^{RM} = [EXD_i^{RM}]^{O}\left[\frac{\mathrm{e} * PWX_i^{RM}(1 + [tmMM_i^{RM}]^{0})}{(PE_i^{FOB})^{RM}(1 + tmMM_i^{RM})}\right]^{\sigma_i^{EXD\_RM}}$	21	EXD_i^{RM}	21
$EXD_i^{AF} = \sum_j EX_{j,i}^{AF}$	21	$(PE_i^{FOB})^{AF}$	21
$EXD_i^{RM} = \sum_j EX_{j,i}^{RM}$	21	$(PE_i^{FOB})^{RM}$	21
$EXD_i = \sum_j EX_{j,i}$	21	PE_i^{FOB}	21
$TIX_i^{AF} = ttix_i^{AF}\left\{PE_i^{AF} + \sum_{ij} PC_{ij} * tmrg_{ij,i}^{X}\right\} * EXD_i^{AF}$	21	TIX_i^{AF}	21
$TIX_i^{RM} = ttix_i^{RM}\left\{PE_i^{RM} + \sum_{ij} PC_{ij} * tmrg_{ij,i}^{X}\right\} * EXD_i^{RM}$	21	TIX_i^{RM}	21
$TIXT^{AF} = \sum_i TIX_i^{AF}$	1	$TIXT^{AF}$	1
$TIXT^{RM} = \sum_i TIX_i^{RM}$	1	$TIXT^{RM}$	1
$TIXT = TIXT^{AF} + TIXT^{RM}$	1*	$TIXT$	1
$TMM_i^{AF} = (tmMM_i^{AF}) * (PE_i^{FOB})^{AF} EXD_i^{AF}$	21	TMM_i^{AF}	21
$TMM_i^{RM} = (tmMM_i^{RM}) * (PE_i^{FOB})^{RM} * EXD_i^{RM}$	21	TMM_i^{RM}	21
$TIX_i = ttix_i\left\{PE_i + \sum_{ij} PC_{ij} * tmrg_{ij,i}^{X}\right\} * EXD_i$	21**	TIX_i	21**

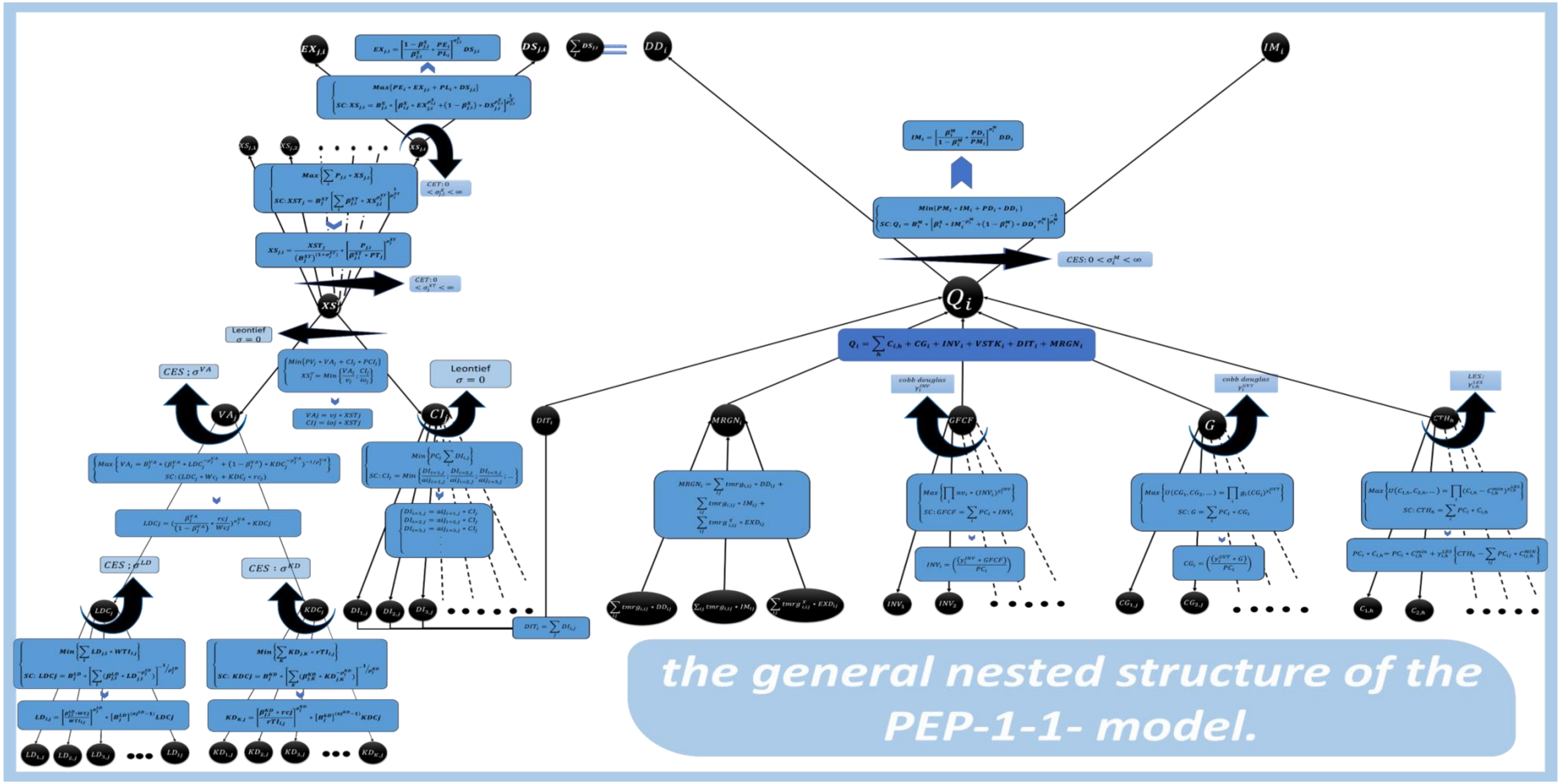
The model equations		Endogenous variables	
EQ of import	318	v. Endogenous	318
$IM_i = B_i^{IM} * \left[\beta_i^{IM} * (IM_i^{AF})^{-\rho_i^{IM}} + (1-\beta_i^{IM}) * (IM_i^{RM})^{-\rho_i^{IM}}\right]^{-\frac{1}{\rho_i^{IM}}}$	21	IM_i^{RM}	21
$IM_i^{AF} = \left[\frac{\beta_i^{M}}{1-\beta_i^{M}} * \frac{PM_i^{RM}}{PM_i^{AF}}\right]^{\sigma_i^{IM}} IM_i^{RM}$	21	IM_i^{AF}	21
$PM_i = \frac{PM_i^{AF} * IM_i^{AF} + PM_i^{RM} * IM_i^{RM}}{IM_i}$	21*	PM_i	21
$PM_i^{AF} = (1+ttic_i)\left[(1+ttim_i^{AF}) * PM\_T_i^{AF} + \sum_{ij} PC_{ij} * tmrg_{(ij,i)}\right]$	21	PM_i^{AF}	21
$PM_i^{RM} = (1+ttic_i)\left[(1+ttim_i^{RM}) * PM\_T_i^{RM} + \sum_{ij} PC_{ij} * tmrg_{(ij,i)}\right]$	21	PM_i^{RM}	21
$PM\_T_i = \frac{PM\_T_i^{AF} * IMO_i^{AF} + PM\_T_i^{RM} * IMO_i^{RM}}{IMOT_i}$	21	$IMOT_i$	21
$IMO_i^{AF} = [IMO_i^{AF}]^O \left[\frac{e * PWM_i^{AF}/[1+teMM_i^{AF}]^O}{PM_{T_i}^{AF}/[1+teMM_i^{AF}]}\right]^{-\sigma_i^{IMO\_AF}}$	21	IMO_i^{AF}	21
$IMO_i^{RM} = [IMO_i^{RM}]^O \left[\frac{e * PWM_i^{RM}/[1+teMM_i^{RM}]^O}{PM_{T_i}^{RM}/[1+teMM_i^{RM}]}\right]^{-\sigma_i^{IMO\_RM}}$	21	IMO_i^{RM}	21
$IM_i^{AF} = IMO_i^{AF}$	21	$PM\_T_i^{AF}$	21
$IM_i^{RM} = IMO_i^{RM}$	21	$PM\_T_i^{RM}$	21
$IM_i = IMOT_i$	21	PM_T_i	21
$TIM_i^{AF} = (ttim_i^{AF}) * PM_{T_i}^{AF} * IM_i^{AF}$	21	TIM_i^{AF}	21
$TIM_i^{RM} = (ttim_i^{RM}) * PM_{T_i}^{RM} * IM_i^{RM}$	21	TIM_i^{RM}	21
$TIMT^{AF} = \sum_i TIM_i^{AF}$	1	$TIMT^{AF}$	1
$TIMT^{RM} = \sum_i TIM_i^{RM}$	1	$TIMT^{RM}$	1
$TIMT = TIMT^{AF} + TIMT^{RM}$	1*	$TIMT$	1
$TEM_i^{AF} = (teMM_i^{AF}) * \frac{PM_{T_i}^{AF}}{(1+teMM_i^{AF})} * IMO_i^{AF}$	21	TEM_i^{AF}	21
$TEM_i^{RM} = (teMM_i^{RM}) * \frac{PM_{T_i}^{RM}}{(1+teMM_i^{RM})} * IMO_i^{RM}$	21	TEM_i^{RM}	21
EQ, government	21	v. Endogenous	21
$.TIC_i = ttic_i[\{PL_i + \sum_{ij} PC_{ij} * tmrg_{ij,i}\}DD_i + [(1 + ttim_i^{AF}) * PM_{T_i}^{AF} \sum_{ij} PC_{ij} * tmrg_{(ij,i)}]IM_i^{AF} + [(1 + ttim_i^{RM}) * PM_{T_i}^{RM} \sum_{ij} PC_{ij} * tmrg_{(ij,i)}]IM_i^{RM}]$	21*	TIC_i	21

The model equations		Endogenous variables	
EQ: The rest of the world	6	v. Endogenous	6
$.YAF = \sum_i PM_{T_i}^{AF} * IM_i^{AF} + \sum_k \lambda_{AF,k}^{RK} * \left(\sum_j R_{k,j} KD_{K,j}\right) + \sum_{AGd} TR_{AF,AGd}$	1	YAF	1
$.YRM = \sum_i PM_{T_i}^{RM} * IM_i^{RM} + \sum_k \lambda_{RM,k}^{RK} * \left(\sum_j R_{k,j} KD_{K,j}\right) + \sum_{AGd} TR_{RM,AGd}$	1	YRM	1
$YROW = YRM + YAF$	1*	$YROW$	1
$SAF = YAF - \sum_i (PE_i^{FOB})^{AF} * EXD_i^{AF} - \sum_{AGd} TR_{AGd,AF}$	1	SAF	1
$.SRM = YRM - \sum_i (PE_i^{FOB})^{RM} * EXD_i^{RM} - \sum_{AGd} TR_{AGd,RM}$	1	SRM	1
$SROW = SAF + SRM$	1*	$SROW$	1
$TR_{AGd,row} = PIXCON^{\eta} * TR_{AGd,row}^{0}$	3**	$TR_{AGd,row}$	3**
EQ: On request	21	v. Endogenous	21
$.MRGN_i = \sum_{ij} tmrg_{i,ij} * DD_{ij} + \sum_{ij} tmrg_{i,ij} * IM_i^{AF} + \sum_{ij} tmrg_{i,ij}^{X} * EXD_i^{AF} + \sum_{ij} tmrg_{i,ij}^{X} * EXD_i^{RM} + \sum_{ij} tmrg_{i,ij} * IM_i^{RM}$	21*	$MRGN_i$	21
EQ: from GDP	1	v. Endogenous	1
$.GDP^{FD} = \sum_i PC_i \left[\sum_h C_{i,h} + CG_i + INV_i + VSTK_i\right] + \left[(PE_i^{FOB})^{RM} * EXD_i^{RM} - \sum_i PM_{T_i}^{RM} * IM_i^{RM}\right] + \left[(PE_i^{FOB})^{AF} * EXD_i^{AF} - \sum_i PM_{T_i}^{AF} * IM_i^{AF}\right]$	1*	GDP^{FD}	1
$TR_{AGd,RM} = \frac{TR_{AGd,RM}}{(PIXCON)^{\eta}}$	3	$TR_{AGd,RM}$	
$TR_{AGd,AF} = \frac{TR_{AGd,AF}}{(PIXCON)^{\eta}}$	3	$TR_{AGd,AF}$	

Source: Authors

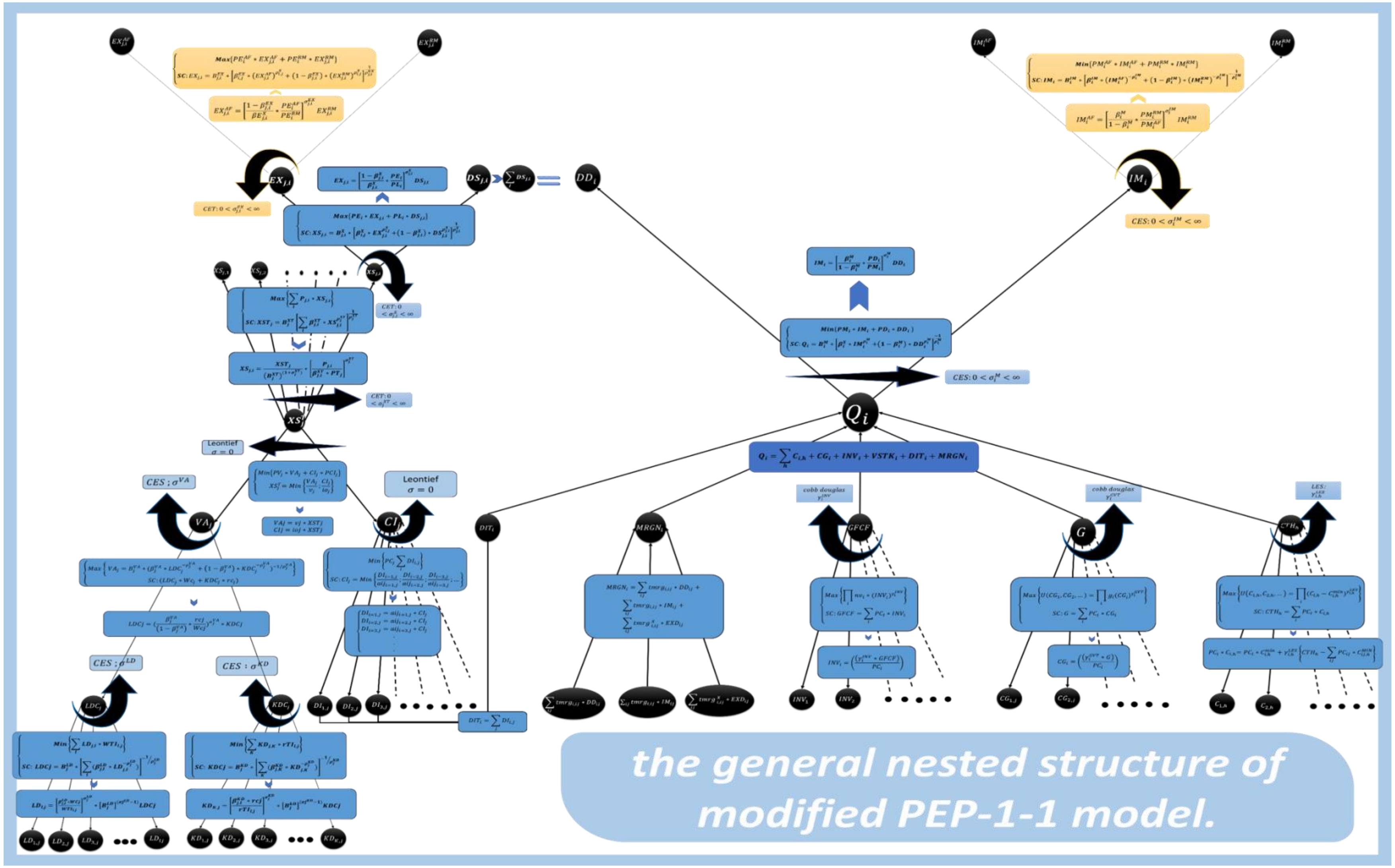
Appendix 5: General Nested Structure of the PEP-1-1 Model.

Figure 1: General Nested Structure of the PEP-1-1 Model.



Source; Authors

Figure 2: Modified General Nested Structure of the PEP-1-1 Model.



Source; Authors