

# Gender Inequalities May Hinder Development: Evidence from Cross-Country Regression

*Macro Workshop*

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# Introduction (1)

## Economic interest:

Average income levels in the world's richest and poorest countries differ by a factor of more than 200:

In 2008, the Democratic Republic of Congo has a per capita GDP of \$297 compared to Luxembourg's \$70 980. <sup>1</sup>

⇒ What accounts for these differences?

⇒ What can we do to reduce them?

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<sup>1</sup>Source: World Development Indicator CD-ROM of the World Bank  

# Introduction (2)

## Growth Literature:

Difference in economic growth can be explained by differences in (physical and human) capital accumulation and technological change.

⇒ Why did some societies manage to accumulate and innovate more rapidly than others?

⇒ What are the determinants of accumulation and innovation considered as the 'deeper' determinants of growth?

# Introduction (3)

## Growth Literature:

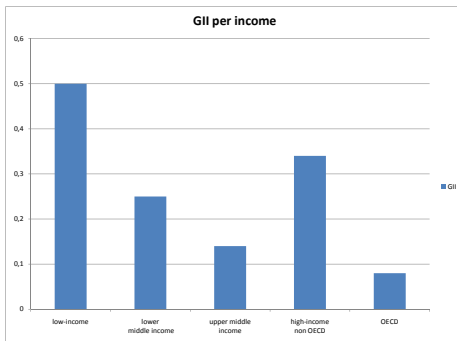
Three schools of thought:

- Geography (Diamond (1997); Gallup et al. (1998), Sachs (2001)),
- Trade integration (Frankel and Romer (1999), Sachs and Warner (1995) and Dollar and Kraay (2004)),
- Institution (North (1990), Hall and Jones (1999), Acemoglu et al. (2001) and Rodrik et al. 2004).

# Introduction (4)

**Gender Literature:** Gender Inequalities may affect growth negatively

Figure: GII per income group



# Introduction (5)

## Which Channels of transmission?

- Reducing Physical Capital Accumulation (Udry 1996),
- Reducing Human Capital Accumulation (Klasen (1999), Dollar and Gatti (1999), Lagerlof (1999), Knowles et al.(2002)),
- Reducing Technological Change (Quisumbig (1996), Von Braun and Webb (1989), Jones (1986)),

⇒ Gender inequalities = a 'deeper' determinants of economic development.

# Introduction (6)

## Contribution:

- An empirical analysis of the relationship between development and gender inequalities using cross-countries regressions and instrumental variables.
- Identify a good instrument for gender inequalities
- This paper constructs a global measure of the multidimensional concept of gender inequalities in developing countries.

1 Gender inequality and development

2 Data

3 The Gender Inequalities Index (GII)

4 Results

5 Conclusion

# Theoretical links between gender inequalities and economic development

- **The direct impact of gender inequalities on development**  
= in reducing the average quality of human capital, the productivity of workers and the factor endowment .
- **The indirect impact of gender inequalities on growth**  
= more corruption occurs and institutional quality is impeded (Swamy, Knack, Lee and Azfar 2001).

# Empirical strategy (1)

Our empirical strategy has four step:

- 1 OLS regressions to estimate the correlation between gender inequalities and the level of development,

$$\lgdp = \alpha_1 + \beta_1 Disteq + \beta_2 Openness + \beta_3 Rule + \beta_4 GII + \epsilon \quad (1)$$

- 2 3SLS regressions to estimate the correlation between gender inequalities and income per worker, capital per worker, human capital per worker and technological change,

$$\logyl = \alpha_2 + \beta_5 \logkl + \beta_6 \loghl + \beta_7 \loga \quad (2)$$

$$\logkl = \alpha_3 + \beta_8 Disteq + \beta_8 Openness + \beta_{10} Rule + \beta_{11} GII + \mu \quad (3)$$

$$\loghl = \alpha_4 + \beta_{12} Disteq + \beta_{13} Openness + \beta_{14} Rule + \beta_{15} GII + \nu \quad (4)$$

$$\loga = \alpha_5 + \beta_{16} Disteq + \beta_{17} Openness + \beta_{18} Rule + \beta_{19} GII + \phi \quad (5)$$

The total effect is:

$$(\beta_5 * \beta_{11}) + (\beta_6 * \beta_{15}) + (\beta_7 * \beta_{19}) \quad (6)$$

## Empirical strategy (2)

- 1 3SLS regressions and GII instrumentation to account for endogeneity,

$$GII = \alpha_6 + \beta_{16} \text{Religion} + v \quad (7)$$

- 2 3SLS to study the inter-relation between gender inequalities and institutional quality,

$$INS = \alpha_7 + \beta_{17} GII + \delta \quad (8)$$

# Data

Table: Data sources

Data name	Definition	Data source
GDP	Initial GDP in 1995	PWT 6.3
yl	Income per worker	Hall and Jones
kl	Physical Capital per worker	Hall and Jones
hl	Human Capital per worker	Hall and Jones
a	Technological Change	Hall and Jones
Openness	Exports plus imports divided by GDP	PWT 6.3
Disteq	Distance from equator (lat/90)	CEPII
Rule	Governance indicators	WGI (World Bank)
Religion	Dummy variable for the major religion (70%)	World Bank

Focus on level of development instead of growth rate because:

- Level capture the difference in long-term economic performance that are most directly relevant to welfare (Hall and Jones 1999),
- Easterly et al. (1993) documented the relative low correlation of growth rate across decades, so differences in growth rate across countries may be mostly transitory.

# Construction of a composite index via MCA

**Why a composite index?** A composite index is built by the aggregation of individual indicators.

It is useful to measure multidimensional concepts which cannot be captured in its varied dimensions by a single indicator.

**Why a Multiple Correspondence Analysis?** MCA studies the relative weights of the different variables.

⇒ Weights are defined endogenously and indicates which form of gender inequality is the heavier for the women situation in the developing world. This aggregation method improves qualitatively the index, because MCA minimizes the statistical bias or imperfection of the data.

NB: Without weight, the variables with the highest variance is considered as the heavier.

# Eight dimensions of gender inequalities (1)

## The Workshop in The Hague (Wieringa 1997):

- Identity (early marriage, the CIRI indicator of womens social right, freedom of dress and freedom of movement);
- Family (the indicator of gender inequality in the family law, parental authority indicator, inheritance rights and the percentage of households headed by women);
- Education (male female ratio in literacy rate, net school enrolment in primary, secondary and tertiary and female share of teachers);
- Physical integrity (the prevalence and acceptance of violence against women, the prevalence of genital mutilation, the indicator of physical security of women, the contraceptive prevalence and the adolescent fertility);

## Eight dimensions of gender inequalities (2)

### The Workshop in The Hague (Wieringa 1997):

- Political representation (the female share of parliament seats, the female legislator share, the female ministry share and the CIRI womens political right);
- Access to economic resources (access to land, credit and property other than land);
- Health (life expectancy ratio, maternal mortality rate and Klasen missing women indicator);
- Employment and earnings (the CIRI womens economic right, the female share in technical and professional, and administrative and management positions, the female male ratio of earned income, of economic activity rate and the female share in active population).

# The GI (1)

Inequality related to gender corresponds to deprivation experienced by the affected women, and that deprivation increases more than proportionally when inequality increases (Branisa, Klasen and Ziegler 2009).

⇒ partial compensation provided by a non-linear indicator is preferred.

$$GII = 0.181Family^2 + 0.156Identity^2 + 0.156Health^2 + 0.146EconomicResources^2 + 0.118Education^2 + 0.116PhysicalIntegrity^2 + 0.068Employment^2 + 0.06Politic^2$$

## The GII (2)

The GII is built for 109 developing countries  
More the gender inequality, more GII is close to 1.

Table: The GII

Country	GII	rank	Country	GII	rank
Afghanistan	0.975	109	Jamaica	0.048	10
Yemen	0.886	108	Mongolia	0.043	9
Chad	0.869	107	Venezuela, RB	0.042	8
Sudan	0.844	106	Philippines	0.034	7
Pakistan	0.772	105	Kazakhstan	0.034	6
Nigeria	0.769	104	Uruguay	0.031	5
Bangladesh	0.769	103	Argentina	0.027	4
Niger	0.767	102	Croatia	0.025	3
India	0.751	101	Moldova	0.021	2
Sierra Leone	0.691	100	Belarus	0.016	1

Source: Own computation

# Results by OLS

Table: OLS Estimation

	lgdp	lgdp	lgdp	lgdp
<i>gii</i>	-3.024*	-1.312*	-2.969*	-2.760**
	(9.08)	(4.33)	(2.87)	(2.04)
<i>disteq</i>		1.723*	1.450**	0.238
		(3.11)	(2.53)	(0.36)
<i>rule</i>		0.442*	0.428*	0.429*
		(4.09)	(3.99)	(3.75)
<i>openc</i>		0.004**	0.004*	0.004*
		(2.53)	(2.69)	(2.67)
<i>gii</i> <sup>2</sup>			2.131***	2.169
			(1.68)	(1.56)
Constant	9.163*	7.942*	8.147*	8.784*
	(67.82)	(30.03)	(28.18)	(20.13)
Inclusion of Regional Dummies	No	No	No	Yes
Observations	106	106	106	106
R-squared	0.44	0.71	0.72	0.78

Absolute value of z statistics in parentheses. \*\*\* denotes significance at 10%; \*\* significance at 5%; \* significance at 1%. Ramsey test was used to test for omitted variables. White test was used to control for heteroscedasticity.

# Results by 3SLS

Table: 3SLS Estimation

	(2)	(3)	(4)	(5)
	logyl	logkl	loghl	loga
logkl	0.333* (1.59)			
loghl	0.667* (7.65)			
loga	0.667* (2.26)			
<b>gii</b>		<b>-4.971*</b> (3.27)	<b>-0.745*</b> (3.50)	<b>-2.108**</b> (2.50)
<i>gii</i> <sup>2</sup>		3.444*** (1.88)	0.288 (1.12)	2.298** (2.24)
disteq		2.815* (3.29)	0.355* (2.96)	1.474* (3.09)
rule		0.148 (0.91)	0.055** (2.41)	0.055 (0.60)
openc		0.006** (2.48)	0.000 (0.36)	0.002 (1.56)
Constant	0.000 (0.32)	8.918* (21.14)	0.633* (10.74)	7.660* (32.42)
Observations	96	96	96	96

Absolute value of z statistics in parentheses. \*\*\* denotes significance at 10%; \*\* significance at 5%; \* significance at 1%. Ramsey test was used to test for omitted variables. White test was used to control for heteroscedasticity.

Control variables are regional dummies. Omitted region is East Asia and Pacific.

# Results by 3SLS

## Interpretation

Gender inequalities have a negative impact on development level by:

- Reducing the physical capital accumulation by 4.97%,
- Reducing the human capital accumulation by 0.75%,
- Reducing the technological change by 2.1%.

The total effect is equal to **-3.55%**, i.e. for the most unequal region, South Asia, which has a GII of 0.63, gender inequalities may reduce economic growth by **2.23%**.

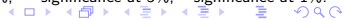
The gender discrimination reduces GDP per worker by **1.7%** and **1.6%** for SSA and MENA respectively.

# Results by IV

Table: 3SLS Estimation and GII Instrumentation

	logyl	gii	logkl	loghl	loga
logkl	0.333*				
	(165670.84)				
loghl	0.667*				
	(94121.08)				
loga	0.667*				
	(253045.93)				
musulman		0.440*			
		(4.03)			
chrtien		0.067***			
		(0.65)			
hindu		0.316***			
		(1.81)			
<b>gii</b>			<b>-1.584**</b>	<b>-0.937**</b>	<b>2.650</b>
			(0.31)	(1.31)	(0.69)
<i>gii</i> <sup>2</sup>			0.077	0.471	-2.869
			(0.01)	(0.55)	(0.64)
rule			0.217***	0.050***	0.169***
			(1.11)	(1.80)	(1.16)
Constant	0.000	0.111	8.483*	0.657*	7.098*
	(0.94)	(1.10)	(10.80)	(5.98)	(11.97)
Observations	93	93	93	93	93

Absolute value of z statistics in parentheses. \*\*\* denotes significance at 10%; \*\* significance at 5%; \* significance at 1%.  
Control variables are disteq, openness and regional dummies.



# Results by 3SLS and GII Instrumentation

## Interpretation

Gender inequalities have a negative impact on development level by:

- Reducing the physical capital accumulation by 1.6%,
- Reducing the human capital accumulation by 0.9%.

The total effect is equal to **-1.15%**, i.e. for the most unequal region, South Asia, which has a GII of 0.63, gender inequalities may reduce economic growth by **0.73%**.

The gender discrimination reduces GDP per worker by **0.55%** and **0.53%** for SSA and MENA respectively.

# Inter-relation between GII and Rule

**Table:** 3SLS Estimation and Inter-relation between GII and Rule

	rule
gii	-1.315** (2.58)
Constant	0.281 (1.58)
Observations	106

Absolute value of z statistics in parentheses. \*\*\* denotes significance at 10%; \*\* significance at 5%; \* significance at 1%. Control variables are disteq, openness and regional dummies.

# Quantitative impact of GII on Development

Gender inequalities have a negative impact on development level by:

- Reducing the physical capital accumulation by 1.6%,
- Reducing the human capital accumulation by 0.9%.
- **Reducing the institutional quality by 1.315%**

The total effect is equal to **-1.44%**, i.e. for the most unequal region, South Asia, which has a GII of 0.63, gender inequalities may reduce economic growth by **0.9%**.

The gender discrimination reduces GDP per worker by **0.7%** and **0.67%** for SSA and MENA respectively.

# Conclusion

Further research:

- Develop a panel data analysis
- Find another instrument for gender inequalities
- Compare the impact of the different 'deeper' determinant of economic performance
- ... Construct a theoretical framework

THANK YOU FOR YOUR ATTENTION