

New Employment Definition, “New” Stylized Facts: The Role of Subsistence Farmers

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Outline

- 1 Introduction
- 2 Definition and measurement
- 3 Characteristics of foodstuff producers
- 4 Cross-country aggregate statistics
 - Labor market status
 - Sectoral employment
 - Productivity
- 5 Conclusion
- 6 Appendix

Motivation

- Cross-country stylized facts:

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 - Employment rate \downarrow in GDP

[Bick, Fuchs-Schündeln, Lagakos & Tsujiyama \(2022\)](#)

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 - ILO's International Conference of Labour Statisticians (ICLS)
- New definition of employment: ICLS 19 versus ICLS 13
- What are the consequences for cross-country stylized facts?

Example: labor force participation rate in Rwanda



- 1 Definition of main change
 - Own-account subsistence farming no longer considered employment

This paper

① Definition of main change

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② Data

- Harmonized cross-country micro data with relevant information
- Characteristics of individuals following new employment definition

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 - Characteristics of individuals following new employment definition
- ③ Main results
 - Employment and sectoral productivity patterns

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Employment according to 13th ICLS (1982)

Employed are all persons who, during a specified reference period, were in paid employment, self-employed as employers or own-account workers, unpaid family workers.

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- Subsistence farmers are employed
- Coincides with the production boundary of System of National Accounts

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*Only work performed for pay or profit is considered as employment and **production of goods for own use (subsistence farming) are no longer employed.***

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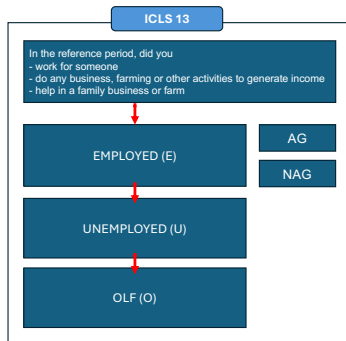
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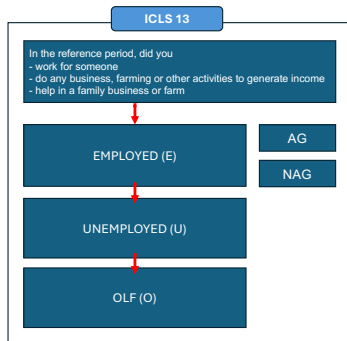
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- Foodstuff producers can be unemployed, out of labor force, or employed based on their secondary activity
- Caveat: not consistent with SNA production boundary

ICLS 13 versus ICLS 19

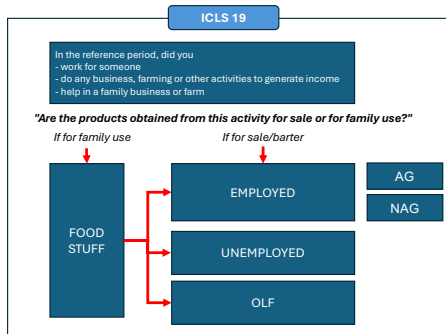


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 - 30 nationally representative household and labor force surveys from 16 countries
 - Surveys allow us to classify individuals according to ICLS 13 and ICLS 19 definitions
 - Employment rate and sector of foodstuff producers via secondary job
 - Sometimes: unemployment (participation) of foodstuff producers
- Comparison with ILO data when available

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Who are the foodstuff producers?

	(1)	(2)
Constant	0.184*** (0.001)	0.087*** (0.002)
Women	0.007*** (0.001)	0.008*** (0.001)
Married	0.058*** (0.001)	0.035*** (0.001)
Age 25-34	-0.030*** (0.001)	-0.008*** (0.001)
Age 35-44	-0.035*** (0.001)	0.004*** (0.001)
Age 45-54	-0.029*** (0.001)	0.025*** (0.001)
Age 55-65	-0.011*** (0.001)	0.053*** (0.001)
Primary	-0.063*** (0.001)	-0.050*** (0.001)
Secondary	-0.168*** (0.001)	-0.094*** (0.001)
Tertiary	-0.229*** (0.001)	-0.148*** (0.001)
Rural	0.153*** (0.001)	0.161*** (0.001)
Country Fixed Effects	N	Y
R ²	0.104	0.175
N observations	1,823,896	1,823,896
N countries	19	19

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Note: The reference group are men, single, aged 15 to 25, no schooling and urban.

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Who are the foodstuff producers by second. empl. status?

	Employed	Unemployed	Out of labor force
Constant	0.033*** (0.008)	0.237*** (0.009)	0.731*** (0.011)
Women	-0.025*** (0.003)	-0.079*** (0.003)	0.104*** (0.004)
Married	0.005 (0.003)	-0.022*** (0.004)	0.017*** (0.004)
Age 25-34	0.034*** (0.004)	0.035*** (0.005)	-0.069*** (0.006)
Age 35-44	0.044*** (0.004)	0.040*** (0.005)	-0.084*** (0.006)
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Age 55-65	0.014** (0.004)	-0.028*** (0.005)	0.014* (0.006)
Primary	0.014*** (0.004)	0.013** (0.004)	-0.027*** (0.005)
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Tertiary	0.147*** (0.010)	0.098*** (0.012)	-0.246*** (0.014)
Rural	0.012** (0.004)	-0.054*** (0.004)	0.042*** (0.005)
Country Fixed Effects	Y	Y	Y
R ²	0.038	0.086	0.080
N observations	41,402	41,402	41,402
N countries	9	9	9

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Out of labor force:

⇒ women

⇒ young & old

⇒ low-educated

⇒ rural

Who are the foodstuff producers second.-empl. sector?

	Agriculture	Industry	Services
Constant	0.660*** (0.022)	0.167*** (0.017)	0.172*** (0.020)
Women	0.001 (0.007)	-0.051*** (0.005)	0.051*** (0.006)
Married	0.009 (0.008)	-0.044*** (0.006)	0.035*** (0.008)
Age 25-34	-0.098*** (0.012)	0.067*** (0.009)	0.031** (0.010)
Age 35-44	-0.086*** (0.012)	0.035*** (0.009)	0.051*** (0.011)
Age 45-54	-0.073*** (0.012)	0.024* (0.009)	0.049*** (0.011)
Age 55-65	-0.090*** (0.013)	0.031** (0.010)	0.060*** (0.012)
Primary	-0.058*** (0.009)	0.013 (0.007)	0.045*** (0.008)
Secondary	-0.103*** (0.011)	-0.011 (0.008)	0.114*** (0.010)
Tertiary	-0.451*** (0.020)	-0.011 (0.015)	0.462*** (0.018)
Rural	0.225*** (0.011)	-0.053*** (0.008)	-0.173*** (0.010)
Country Fixed Effects	Y	Y	Y
R ²	0.270	0.181	0.269
N observations	17,158	17,158	17,158
N countries	15	15	15

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Note: Individuals are foodstuff producers and employed in secondary activity. The reference group are men, single, aged 15 to 25, no schooling and urban.

Who are the foodstuff producers second.-empl. sector?

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⇒ very young

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⇒ unmarried

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- ⇒ men
- ⇒ unmarried
- ⇒ young
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- ⇒ women
- ⇒ married
- ⇒ educated
- ⇒ older
- ⇒ urban

Outline

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- 2 Definition and measurement
- 3 Characteristics of foodstuff producers
- 4 Cross-country aggregate statistics
 - Labor market status
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From ICLS 13 to ICLS 19: labor market status

- Employment rate ↓

$$e^{\text{ICLS19}} = e^{\text{ICLS13}} - \underbrace{f \times (1 - p_e)}$$

Non-employed foodstuff producers

From ICLS 13 to ICLS 19: labor market status

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- Labor force participation rate ↓

$$\ell^{\text{ICLS19}} = \ell^{\text{ICLS13}} - \underbrace{f \times (1 - p_e - p_u)}_{\text{Non-participating foodstuff producers}}$$

From ICLS 13 to ICLS 19: labor market status

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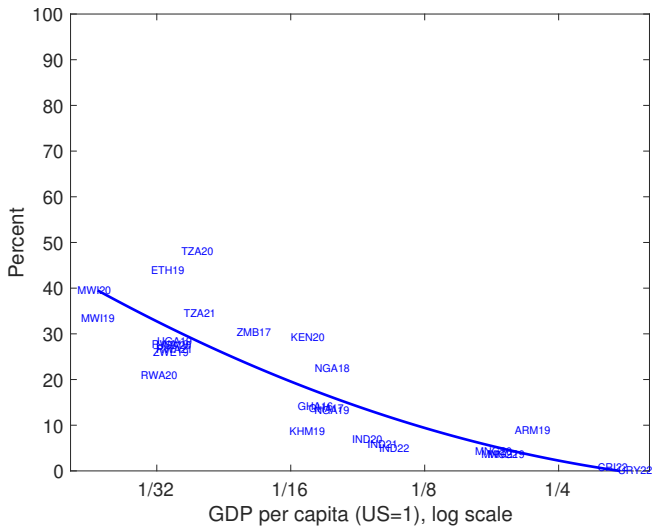
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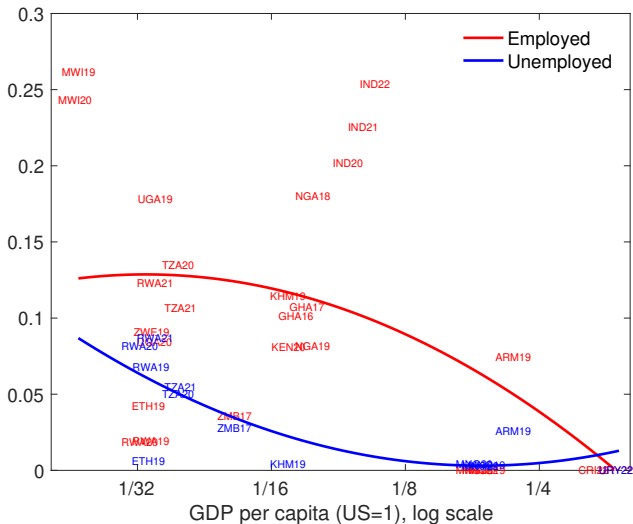
- Unemployment rate ↑

$$u^{\text{ICLS19}} = u^{\text{ICLS13}} + \underbrace{\frac{f}{\ell^{\text{ICLS19}}} \times \left[(1 - p_e) u^{\text{ICLS13}} + p_u (1 - u^{\text{ICLS13}}) \right]}_{\text{Fewer employed and more unemployed workers}}$$

Rate of foodstuff producers



Empl. and unempl. share of foodstuff producers, p_e & p_u



Source of variation

Comparison of **lowest-income** and **middle-income** countries

$$\bullet e^{\text{ICLS19}} = e^{\text{ICLS13}} - \underbrace{f}_{0.32/0.02} \times \underbrace{(1 - p_e)}_{0.87/0.96}$$

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Source of variation

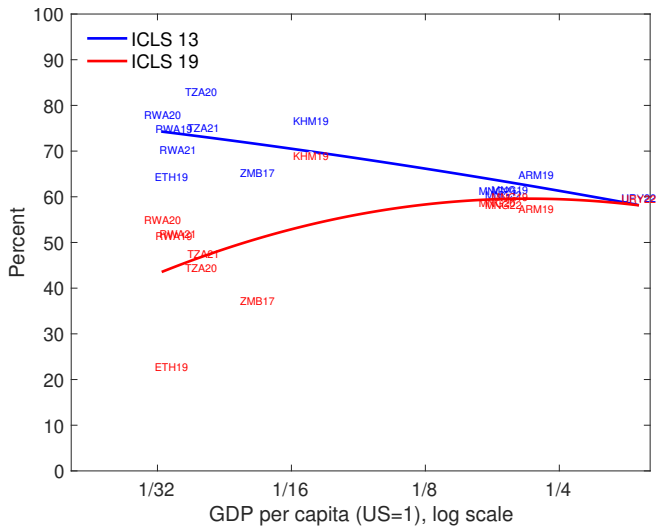
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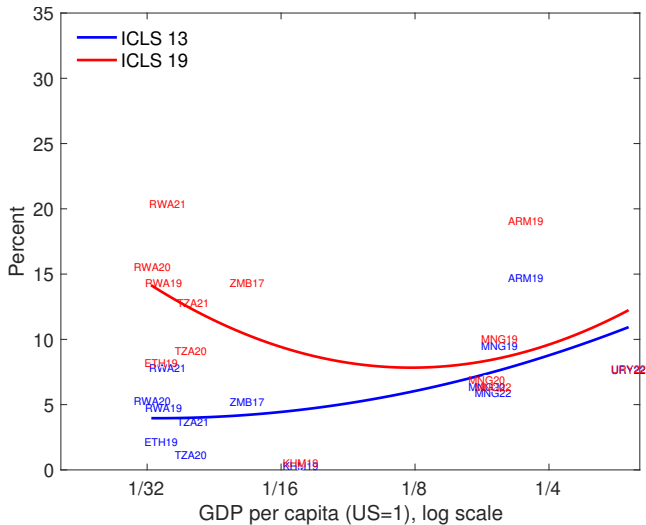
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$$\bullet u^{\text{ICLS19}} = u^{\text{ICLS13}} + \underbrace{\frac{f}{\ell^{\text{ICLS19}}}}_{0.78/0.03} \times \underbrace{\left[(1 - p_e) u^{\text{ICLS13}} + p_u (1 - u^{\text{ICLS13}}) \right]}_{0.09/0.10}$$

Labor force participation rate



Unemployment rate



Summary: employment and unemployment rates

Employment rate

GDP p.c. (US=1)	1/32	1/16	1/8	1/4
ICLS 13	70.3	62.8	57.2	53.5
ICLS 19	42.0	45.1	48.2	51.4
Difference	-28.3	-17.7	-9.0	-2.1

Unemployment rate

GDP p.c. (US=1)	1/32	1/16	1/8	1/4
ICLS 13	4.0	4.4	6.0	8.8
ICLS 19	14.3	9.4	7.8	9.6
Difference	10.4	5.0	1.8	0.8

Outline

- 1 Introduction
- 2 Definition and measurement
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- 4 Cross-country aggregate statistics**
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- 6 Appendix

From ICLS 13 to ICLS 19: sectoral employment

- Share of employment in agriculture ↓

$$\lambda_a^{\text{ICLS19}} = \lambda_a^{\text{ICLS13}} - \underbrace{\frac{f}{e^{\text{ICLS19}}} \left[(1 - p_e) (1 - \lambda_a^{\text{ICLS13}}) + p_e (1 - p_a) \right]}_{\text{Fewer agricultural workers}}$$

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- Share of employment in sector j ↑

$$\lambda_j^{\text{ICLS19}} = \lambda_j^{\text{ICLS13}} + \underbrace{\frac{f}{e^{\text{ICLS19}}} \left[(1 - p_e) \lambda_j^{\text{ICLS13}} + p_e p_j \right]}_{\text{More non-agricultural workers}}$$

Source of variation

Comparison of **lowest-income** and **middle-income** countries

$$\bullet \lambda_a^{\text{ICLS19}} = \lambda_a^{\text{ICLS13}} - \underbrace{\frac{f}{e^{\text{ICLS19}}}}_{0.76/0.04} \times \underbrace{\left[(1 - p_e) \left(1 - \lambda_a^{\text{ICLS13}} \right) + p_e (1 - p_a) \right]}_{0.30/0.76}$$

Source of variation

Comparison of **lowest-income** and **middle-income** countries

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Source of variation

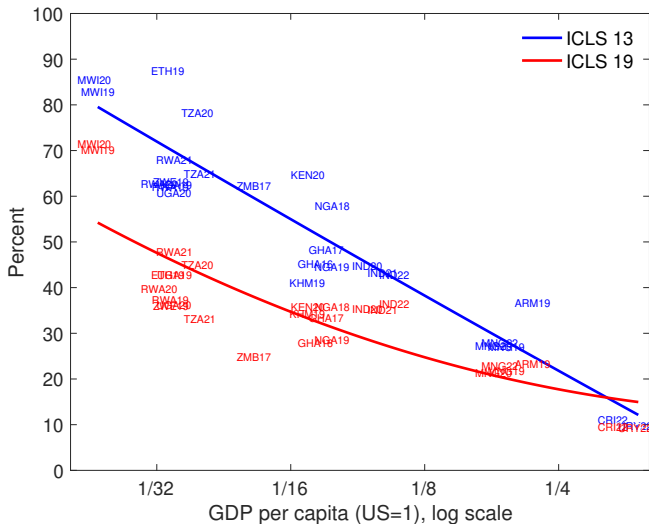
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$$\bullet \lambda_s^{\text{ICLS19}} = \lambda_s^{\text{ICLS13}} + \underbrace{\frac{f}{e^{\text{ICLS19}}}}_{0.76/0.04} \times \underbrace{\left[(1 - p_e) \lambda_s^{\text{ICLS13}} + p_e p_s \right]}_{0.22/0.57}$$

Employment share agriculture



Summary: sectoral employment shares

Agriculture

GDP p.c. (US=1)	1/32	1/16	1/8	1/4
ICLS 13	72.0	55.0	38.3	21.8
ICLS 19	47.6	34.7	24.8	17.7
Difference	-24.4	-20.3	-13.5	-4.1

Industry

GDP p.c. (US=1)	1/32	1/16	1/8	1/4
ICLS 13	7.0	15.0	19.3	19.9
ICLS 19	13.2	20.6	23.3	21.2
Difference	6.2	5.6	4.0	1.3

Services

GDP p.c. (US=1)	1/32	1/16	1/8	1/4
ICLS 13	21.0	30.0	42.4	58.3
ICLS 19	39.2	44.6	51.9	61.0
Difference	18.2	14.6	9.5	2.8

Outline

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Summary: productivity

Labor productivity

GDP p.c. (US=1)	1/32	1/16	1/8	1/4
ICLS 13	0.040	0.084	0.166	0.303
ICLS 19	0.068	0.119	0.198	0.316
Difference	0.028	0.034	0.032	0.012

Agricultural productivity gap

GDP p.c. (US=1)	1/32	1/16	1/8	1/4
ICLS 13	0.14	0.23	0.34	0.47
ICLS 19	0.43	0.52	0.58	0.58
Difference	0.29	0.29	0.23	0.11

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Conclusion

- Cross-country patterns
 - Employment:
 - Employment rate \uparrow instead of \downarrow in GDP

Conclusion

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 - Productivity:

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 - GDP per worker \uparrow 30% in poorest countries

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 - GDP per worker \uparrow 30% in poorest countries
 - Agricultural productivity gap \downarrow 3-fold in poorest countries

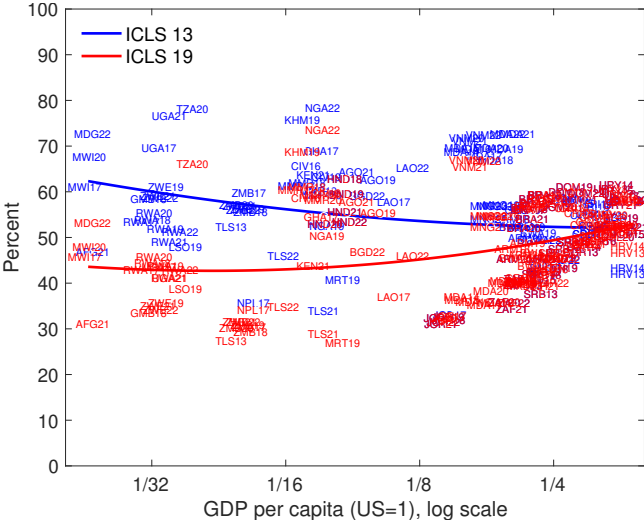
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- Caveat: productivity measures are inconsistent

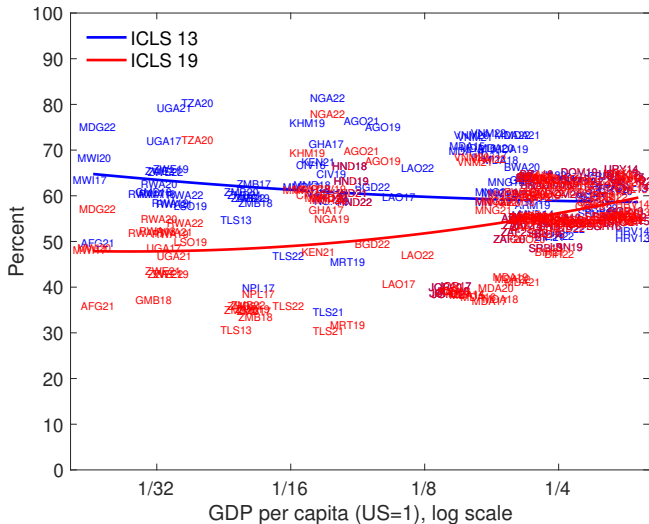
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Employment rate: ILO



Labor force participation rate: ILO



Summary: employment and unemployment rates, ILO

Employment rate

GDP p.c. (US=1)	1/32	1/16	1/8	1/4
ICLS 13	60.0	56.2	53.6	52.3
ICLS 19	42.9	43.0	45.2	49.4
Difference	-17.1	-13.2	-8.4	-2.9

Unemployment rate

GDP p.c. (US=1)	1/32	1/16	1/8	1/4
ICLS 13	5.4	9.1	11.2	11.6
ICLS 19	10.8	12.4	12.8	12.2
Difference	5.4	3.3	1.7	0.6

Summary: productivity

Labor productivity

GDP p.c. (US=1)	1/32	1/16	1/8	1/4
ICLS 13	0.047	0.090	0.167	0.298
ICLS 19	0.067	0.119	0.199	0.315
Difference	0.020	0.028	0.032	0.017

Rate of foodstuff producers: ILO

