

Decomposing the Change in GDP per capita

Using Rwanda as an Example

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PREM Learning Week

**New Tools for more Employment
Focused Development Strategies**



Basic Trends, 2000-2006

Source: MINECOFIN (GDP), eicv1 & eicv2 (Employment and Population)

	2000 2001 RWF (US\$)*	2006 2001 RWF (US\$)*	Δ	% Δ	Annual Growth Rate
GDP per capita	80,987 (\$857)	97,847 (\$1,036)	16,859 (\$179)	20.8%	3.2%
Employment (1000s)	3,495	4,002	507	14.5%	2.3%
Poverty Headcount	.604	.569	-.035	-5.9%	-1.0%

* 94 2001 RWF = \$1 US (PPP)

Decomposing change in GDP per capita

$$Y/N = (Y/E)(E/A)(A/N)$$

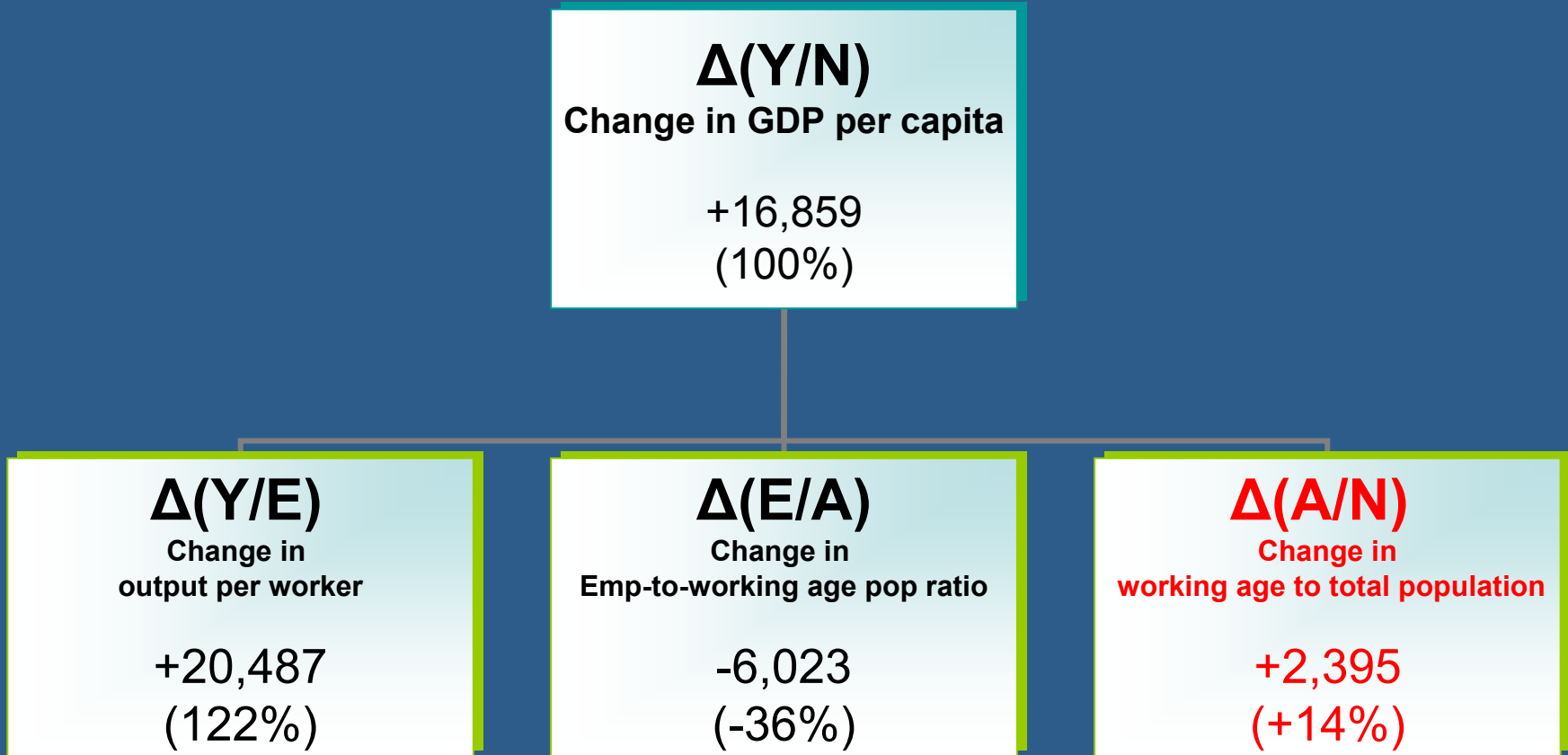
GDP (value added) per capita can be decomposed into 3 parts:

- Output per worker
- Employment to (Working Aged) Population Ratio
- Working Aged Population to Total Population

Decomposition of the *change in* GDP uses Shapley approach to divide each component

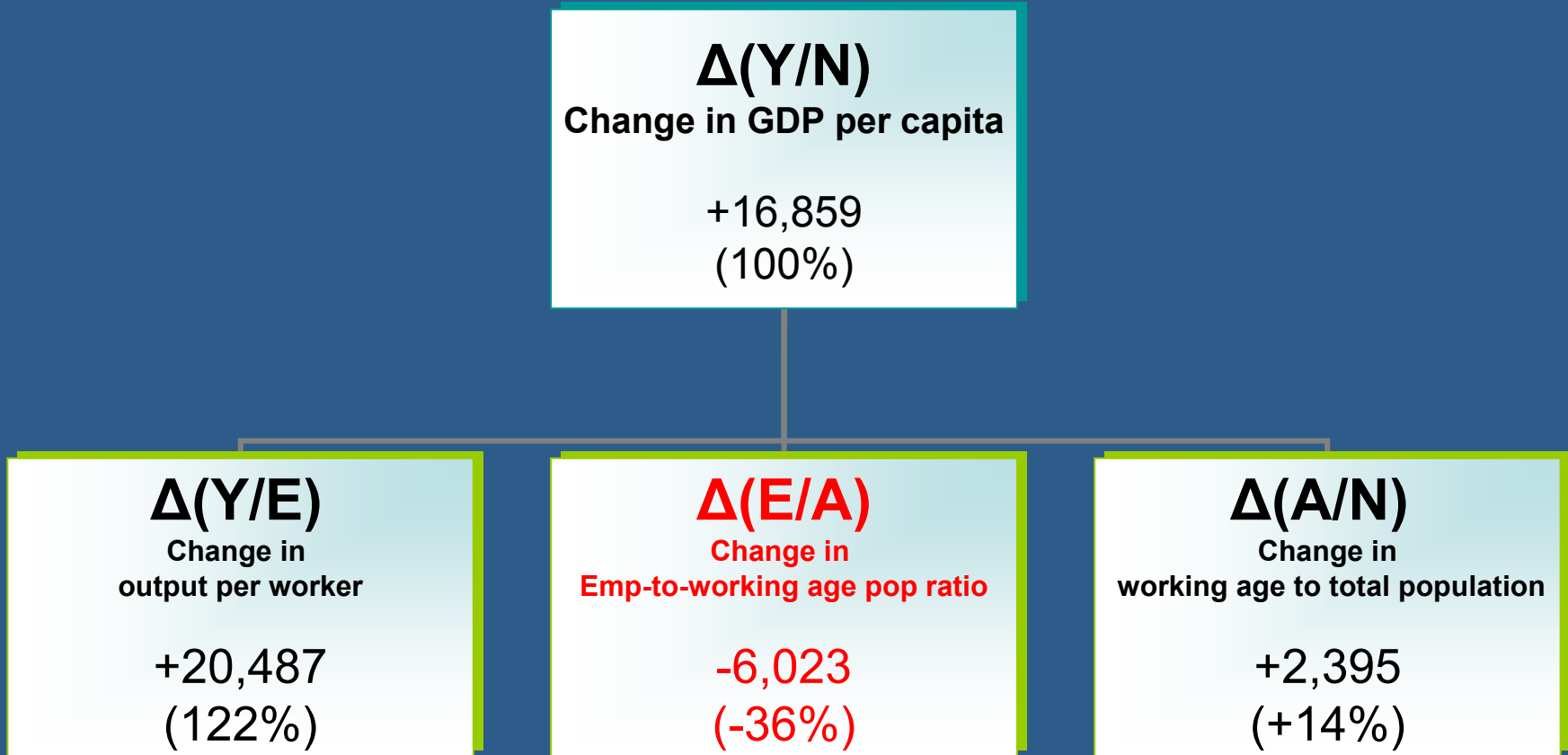
As with all such decompositions, this does not provide a direct causal interpretation.

Decomposing change in GDP per capita



- Increased share of the population was working aged (15-64)

Decomposing change in GDP per capita



- Lower participation is associated with a sizable decline in GDP per capita of 6,023 RWF
 - 7.4% of GDP per cap in 2000; 36% of the Δ in GDP per capita
 - This was driven by 15 to 24 year-olds (which had sizeable gains in enrollment rates)

Decomposing change in GDP per capita due to employment changes

$\Delta(E/A)$

-6,023
(-36%)

Primary

-15,693
(-93%)

Secondary

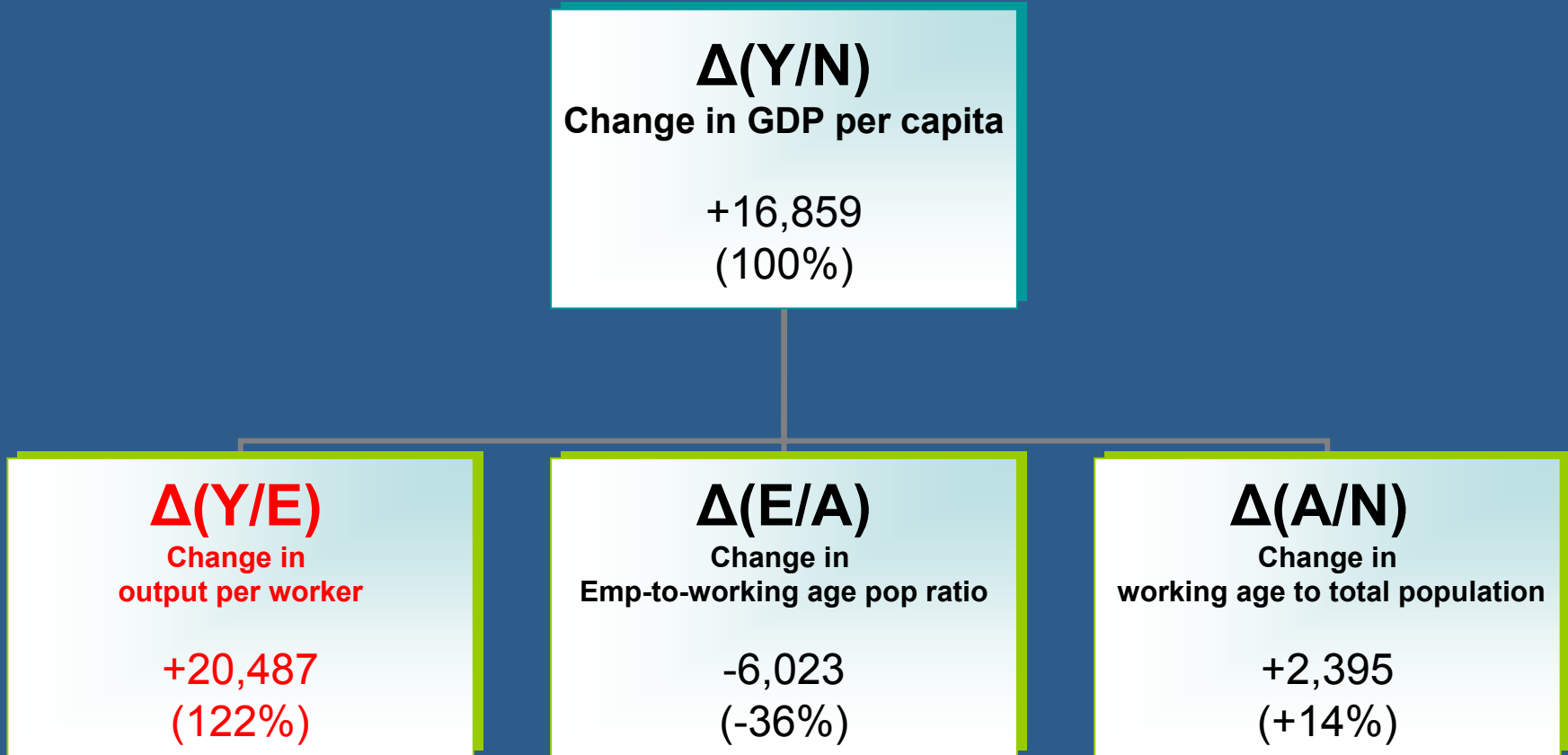
+2,711
(+16%)

Tertiary

+6,959
(+41%)

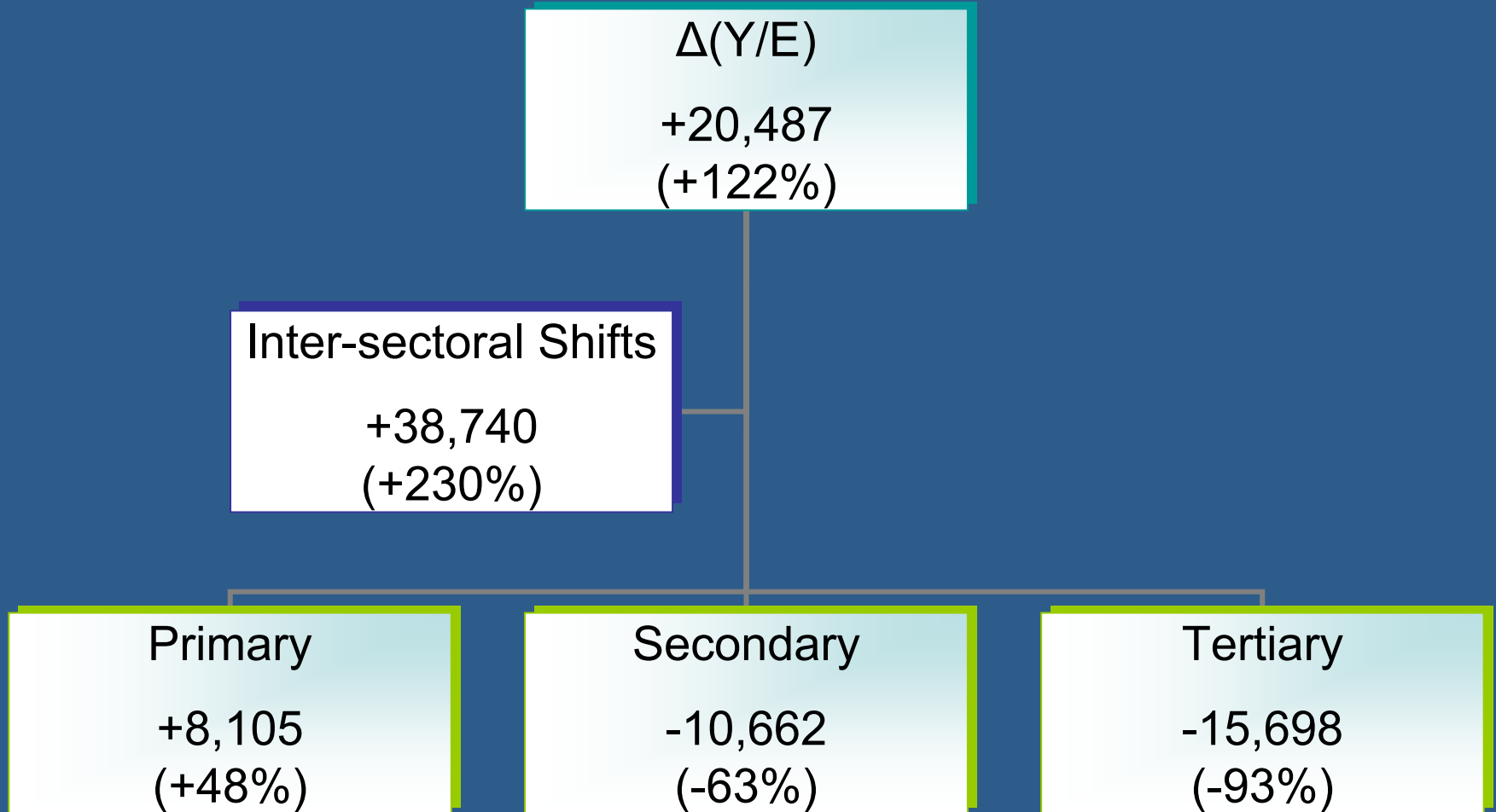
Note: Values represent the contribution to the change in GDP per capita
Percentage values are in percent of total change in GDP per capita

Decomposing change in GDP per capita



- Notice the increase in output per worker. This drives growth in GDP per capita.
 - 25% of GDP per cap in 2000; 122% of the Δ in GDP per capita

Decomposing change in GDP per capita due to changes in output per worker



Note: Values represent the contribution to the change in GDP per capita
Percentage values are in percent of total change in GDP per capita

Changes in Value Added and Employment across sectors

GDP in billions of RWF (2001)			
Sector	2000	2006	% change
Primary	254.5	322.0	26.5%
Secondary	93.1	147.8	58.8%
Tertiary	297.3	459.0	54.4%
TOTAL	644.8	928.7	44.0%

Employment			
Sector	2000	2006	% change
Primary	3,097,241	3,068,009	-0.9%
Secondary	65,012	204,734	214.9%
Tertiary	333,237	729,283	118.8%
TOTAL	3,495,491	4,002,026	14.5%

Further analysis- details in guide

- Examine inter-sectoral changes accounted for by sector
- Decompose into changes in output per worker (within sectors) into TFP and capital-labor ratio components
 - Need information on:
 - share of national income going towards capital
 - Capital STOCK

Can it be done in practice???

This decomposition sounds complicated!

Will it be time-consuming to compute???

LET'S SEE

Will see today

- Demonstration (now)
- Output in exercises
- At two working stations where you can do it yourselves using data from Rwanda, Nicaragua, and Bangladesh