

Assessing the Economic Contribution of Labour Migration in South Africa by a Dynamic Multisectoral Macroeconomic Model – A Discussion Paper on the Methodology to Shock the INFORUM model

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The structure of the presentation is as follows:

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Introduction and background

- The ECM project – understanding of the economic impact of immigration in 10 low middle-income countries.
- South Africa's involvement – high unemployment rate, which raises questions about the need for additional labour through immigration.

Objective and Scope of Project

Migrant workers impact

- Aggregate supply (capital stock and labour supply).
- Effects on productivity and technological changes.
- Aggregate demand (investment, consumption and government expenditure).

USA study (Werling, 2015)

Uniqueness of South Africa - structural unemployment $\pm 25\%$.

Labour migration in South Africa

- Historically, migrant workers have become an established part of the South African labour scene.
- Sectors involved:
 - Agriculture
 - Sheep shearers – From Lesotho
 - Vegetables – Northern Province, from Zimbabwe
 - Subtropical fruits – Mpumalanga Province, from Mozambique
 - Vineyards – Western Province
 - Gold Mines – Gauteng, North West and Free State Provinces, from Mozambique
 - Manufacturing (high skilled personnel) – From RSA International Trading Partners
 - Construction (Electricians, Plumbers, etc.) – Gauteng Province

Labour migration in South Africa (cont.)

- Hospitality (hotels and restaurants) - Gauteng
- Government - Medical Doctors and Civil Engineers
- Education
 - Universities (lectures and students) – City Universities
 - School teachers (Mathematics and Physical Science) – Limpopo, from Zimbabwe
- Service sector (specific occupations)
 - Hair dressers – from North Africa
 - Eastern carpets – from Turkey
 - Small Supermarkets – Townships (from Pakistan)
 - Cafés – from Greeks
 - Green grocers – Portuguese
 - Restaurants - Asian



Shocking the INFORUM model - Scenario 1: Full employment

- Production function: Economic growth is dependent on labour and capital.

Problem! Production function is determined from the demand side and not from the production factor side.

$$\text{SAFRIM: } \text{outc} = ! (I-\text{AMC}) * \text{fdc}$$

Where:

outc = total output (production)

! (I-AMC) = inverse matrix

fdc = total final demand (total demand minus imports)

Shocking the INFORUM model - Scenario 1: Full employment (cont.)

Solution!

- The direct contribution of labour migration will have to be calculated outside the model.
- Production will be adjusted to take into account labour migrations' impact on a sectoral basis.

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outc = !(I-AMC) * fdc;
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outc_adj = outc + migrants_direct_contribution
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- Option 1 is to calculate the impact of migrant labourers is to make use of production functions on a sectoral basis.
- Option 2 is to use the remuneration of labour migrants as the contribution of them to production (an additional amount for profit should be added as well making provision for the intermediated products).

Shocking the INFORUM model - Scenario 2: Structural unemployment

- In the case of structural unemployment, labour migrants do not directly contribute to production via the production function.
- Production increases also due to labour productivity.
- Unit cost of a product is impacted by labour productivity.

SAFRIM: $uc = va/outc$

Where:

uc = unit cost per sector

va = value added per sector

$outc$ = output per sector in constant prices

Shocking the INFORUM model - Scenario 2: Structural unemployment (cont.)

- Contribution of unit cost to economic growth

Step 1: Direct Impact on Domestic Prices

$$\text{adj_uc} = \text{impr} + \text{uc}$$

Where:

adj_uc = change in domestic prices plus the change in import prices

impr = import prices

uc = unit cost

Shocking the INFORUM model - Scenario 2: Structural unemployment (cont.)

Step 2: Total Impact on Domestic Prices

$$ppi = (\sim adj_uc) * DPINV$$

Where:

ppi = producer price index

adj_uc = adjusted unit cost

DPINV = domestic inverse matrix

Step 3: Impact on world relative prices

Shocking the INFORUM model - Scenario 2: Structural unemployment (cont.)

Step 3: Impact on world relative prices

$$wrp = (wpi/EXRN)/ppi$$

Where:

wrp = world relative prices

wpi = world price index

EXRN = nominal effective exchange rate

ppi = producer price index

Shocking the INFORUM model - Scenario 2: Structural unemployment (cont.)

Step 4: Impact of world relative prices on exports

Regression: $exc1 = ! wrp1, WLDDEM, TIMET$

Exports: Agriculture, Forestry and Fishing		
Variable name	Reg-Coeff	t-value
RSQ	0.8853	
RBSQ	0.8797	
wrp1 (world relative prices)	1157.484	1.436
WLDDEM (world demand)	16921.51	14.693
TIMET	-3.61787	-4.102

Shocking the INFORUM model - Scenario 2: Structural unemployment (cont.)

Step 5: Impact of world relative prices on imports

Regression: $imc14 = wrp14, gdec14$

Imports: Printing, Publishing and Recorded Media		
Variable name	Reg-Coeff	t-value
RSQ	1212.38	
RBSQ	1047.44	
intercept	10243.44	9.15
wrp14 (world relative prices)	-8556.59	-8.435
gdec14 (gross domestic expenditure)	0.09288	1.583

Shocking the INFORUM model - Scenario 2: Structural unemployment (cont.)

Step 6: Impact on total final demand (constant prices)

SAFRIM: $fd = pce + gov + inv + \mathbf{ex} - \mathbf{im}$

Step 7: Impact on output (constant prices)

SAFRIM: $out = !(I-AM) * fd$

Conclusion

- Both shocking methods, Scenario 1 (full employment situation) as well as Scenario 2 (structural employment situation) will be employed .
- Scenario 1 is used for the skilled labour migrants and those labour migrants that native labourers are not keen to do.
- Scenario 2 is used for semi and unskilled labourers, where it can be proved that migrant labourers substitute South African labours.

Thank You

