58_Ethiopia

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1 How has the distribution of social protection and labor program beneficiaries across income quintiles evolved in Ethiopia between 2004 and 2018?

1.1 Abstract

Using World Bank World Development Indicators (WDI) data, this study examines how the distribution of social protection and labor (SPL) program beneficiaries evolved across income quintiles in Ethiopia between 2004 and 2018. These indicators capture how inclusively social protection programs reach different income groups — particularly the poorest households — and how effectively they target those most in need. Over the period, the data reveal meaningful shifts in the relative shares of beneficiary incidence among Ethiopia's poorest and richest quintiles. In 2004, SPL benefits were most concentrated among the second and third quintiles, while by 2018 the first quintile (the poorest) had become the most represented beneficiary group. The first quintile's share rose from about 23% to roughly 27%, while the second and third quintiles saw declines from about 27% and 26% to 23% and 20%, respectively. Meanwhile, the fourth quintile increased modestly from around 10% to 16%, and the fifth (richest) quintile remained largely unchanged at approximately 15%. These patterns suggest a gradual but meaningful improvement in targeting toward poorer households, alongside persistent inclusion of higher-income groups within social protection coverage.

1.2 1. Question

How has the distribution of social protection and labor program beneficiaries across income quintiles evolved in Ethiopia between 2004 and 2018?

- **1st Quintile (Poorest) proxy**: Beneficiary incidence in 1st quintile (poorest) (%) — All Social Protection and Labor
- **2nd Quintile proxy**: Beneficiary incidence in 2nd quintile (%) — All Social Protection and Labor
- **3rd Quintile proxy**: Beneficiary incidence in 3rd quintile (%) — All Social Protection and Labor
- **4th Quintile proxy**: Beneficiary incidence in 4th quintile (%) — All Social Protection and Labor
- **5th Quintile (Richest) proxy**: Beneficiary incidence in 5th quintile (richest) (%) — All Social Protection and Labor

1.3 2. Data

- **Source**: World Bank World Development Indicators (WDI)
- **Indicators**:
  - Beneficiary incidence in 1st quintile (poorest) (%) — All Social Protection and Labor
  - Beneficiary incidence in 2nd quintile (%) — All Social Protection and Labor
  - Beneficiary incidence in 3rd quintile (%) — All Social Protection and Labor
  - Beneficiary incidence in 4th quintile (%) — All Social Protection and Labor
  - Beneficiary incidence in 5th quintile (richest) (%) — All Social Protection and Labor
- **Coverage**: Ethiopia, 2004–2018
- **Notes**: National-level data only

1.4 3. Method

1. Filtered the dataset for Ethiopia and selected all five quintile-level SPL beneficiary incidence indicators.
2. **Extracted relevant columns**: Year, Indicator Name, and Value.
3. Pivoted the dataset to create a comparative time series of the five income quintiles.
4. Produced a multi-line chart visualizing how each quintile's share of beneficiaries evolved over time and how relative targeting shifted between 2004 and 2018.

(Analysis is descriptive; no causal inference applied.)

1.5 4. Results

- **1st quintile (poorest)**: Increased from about 23% in 2004 to around 27% in 2018 — becoming the highest beneficiary share by the end of the period.
- **2nd quintile**: Declined from roughly 27% to 23%, shifting from the most to the second-most represented group.
- **3rd quintile**: Fell from about 26% to 20%, dropping from second-highest to middle rank.
- **4th quintile**: Rose moderately from around 10% to 16%, suggesting growing inclusion of near-middle-income households.
- **5th quintile (richest)**: Remained relatively constant at about 15% across the period, reflecting limited but persistent benefit incidence among higher-income groups.

(Figure 1. Ethiopia: Beneficiary Incidence of Social Protection and Labor Programs by Income Quintile (%), 2004–2018)

(Table 1. Pivoted dataset summary)

1.6 5. Interpretation

- The rise in the 1st quintile's share indicates modest improvement in targeting toward poorer households — a positive sign of greater pro-poor reach within Ethiopia's SPL system.
- Declines in the 2nd and 3rd quintiles suggest redistribution of program focus, potentially due to policy shifts prioritizing extreme poverty alleviation.
- The increasing 4th quintile share and stable 5th quintile share imply that while progress was made in reaching the poorest, social protection coverage continued to include a non-negligible portion of higher-income households.
- Together, these dynamics reflect a gradual move toward improved targeting efficiency but also highlight persistent inclusion errors that dilute the equity of social protection distribution.

1.7 6. Limitations

- Beneficiary incidence data are based on survey estimates, which may be affected by reporting bias or sample variability.
- The analysis does not distinguish between different program types (cash transfers, labor programs, pensions), which may have differing targeting effectiveness.
- Limited temporal data points (2004–2018) restrict insights into annual fluctuations or policy-specific effects.

1.8 7. Next Steps / Extensions

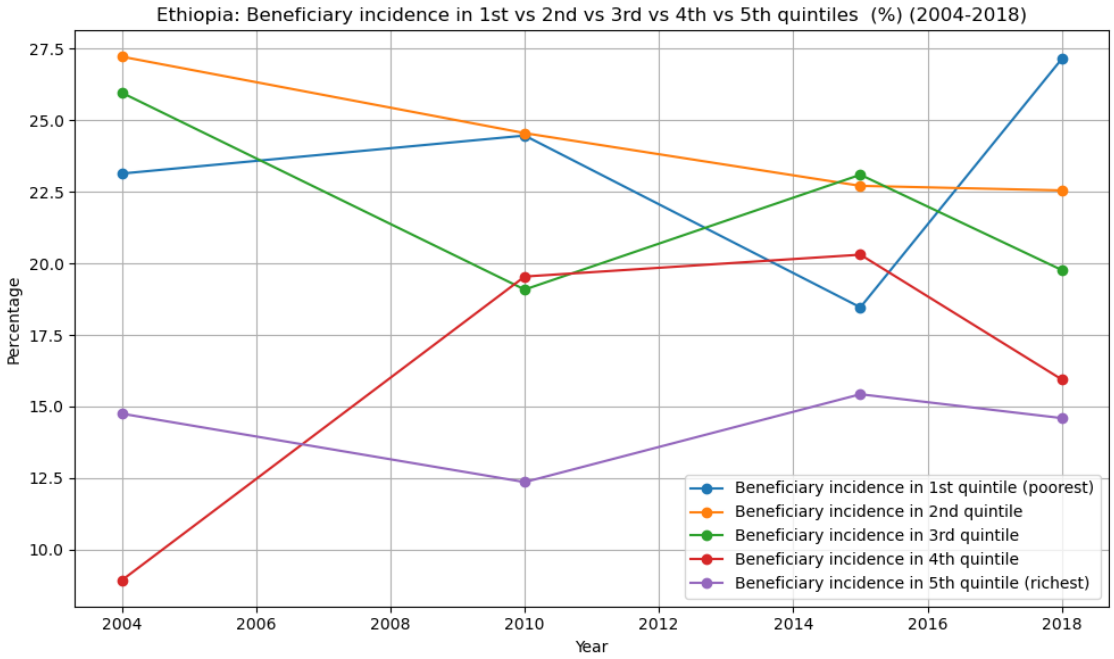
- Disaggregate analysis by program type to distinguish between social assistance, social insurance, and labor market interventions.
- Examine how targeting reforms (such as the Productive Safety Net Programme) contributed to the observed redistribution among quintiles.
- Compare Ethiopia's targeting efficiency with that of other Sub-Saharan African countries to assess regional progress toward pro-poor inclusion.
- Explore the relationship between social protection beneficiary incidence and poverty headcount ratios to evaluate direct welfare impacts.

[1]:
```
# How has the distribution of social protection and labor program beneficiaries␣
↪across income quintiles evolved in Ethiopia between 2004 and 2018?

import pandas as pd
import matplotlib.pyplot as plt
import os

# Folders
data_raw_folder = "data_raw/"
data_clean_folder = "data_clean/"
figures_folder = "figures/"

# Load CSV
filename = "social-protection-and-labor_eth_filtered.csv"  # Filtered dataset␣
↪with only relevant rows
df = pd.read_csv(os.path.join(data_raw_folder, filename))

# Keep only needed columns
df = df[["Year", "Indicator Name", "Value"]]

# Convert Year and Value to numeric, drop invalid rows
df["Year"] = pd.to_numeric(df["Year"], errors="coerce")
df["Value"] = pd.to_numeric(df["Value"], errors="coerce")
df = df.dropna(subset=["Year", "Value"])

# Pivot indicators into separate columns
df_pivot = df.pivot(index="Year", columns="Indicator Name", values="Value").
↪reset_index()
```

```
df_pivot = df_pivot.sort_values("Year")

print("Pivoted Ethiopia dataset:")
display(df_pivot)

# Interpolate missing values for smooth plotting (optional)
df_plot = df_pivot.interpolate(method='linear')

# Plot the indicators
plt.figure(figsize=(10,6))
plt.plot(df_plot["Year"], df_plot["Beneficiary incidence in 1st quintile␣
 ↪(poorest) (%) -All Social Protection and Labor"],
         marker='o', linestyle='-', label="Beneficiary incidence in 1st␣
 ↪quintile (poorest)")
plt.plot(df_plot["Year"], df_plot["Beneficiary incidence in 2nd quintile (%)␣
 ↪-All Social Protection and Labor"],
         marker='o', linestyle='-', label="Beneficiary incidence in 2nd␣
 ↪quintile")
plt.plot(df_plot["Year"], df_plot["Beneficiary incidence in 3rd quintile (%)␣
 ↪-All Social Protection and Labor"],
         marker='o', linestyle='-', label="Beneficiary incidence in 3rd␣
 ↪quintile")
plt.plot(df_plot["Year"], df_plot["Beneficiary incidence in 4th quintile (%)␣
 ↪-All Social Protection and Labor"],
         marker='o', linestyle='-', label="Beneficiary incidence in 4th␣
 ↪quintile")
plt.plot(df_plot["Year"], df_plot["Beneficiary incidence in 5th quintile␣
 ↪(richest) (%) -All Social Protection and Labor"],
         marker='o', linestyle='-', label="Beneficiary incidence in 5th␣
 ↪quintile (richest)")

plt.title("Ethiopia: Beneficiary incidence in 1st vs 2nd vs 3rd vs 4th vs 5th␣
 ↪quintiles  (%) (2004-2018)")
plt.xlabel("Year")
plt.ylabel("Percentage")
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.savefig(os.path.join(figures_folder,␣
 ↪"ethiopia_beneficiary_incidence_in_1st_vs_2nd_vs_3rd_vs_4th_vs_5th_quintiles.
 ↪png"))
plt.show()

# Save cleaned CSV
```

```
df_pivot.to_csv(os.path.join(data_clean_folder,␣
 ↪"ethiopia_beneficiary_incidence_in_1st_vs_2nd_vs_3rd_vs_4th_vs_5th_quintiles"),␣
 ↪index=False)
```

```
Pivoted Ethiopia dataset:

Indicator Name  Year  \
0               2004
1               2010
2               2015
3               2018

Indicator Name  Beneficiary incidence in 1st quintile (poorest) (%) -All Social␣
 ↪Protection and Labor  \
0                                                      23.136999
1                                                      24.463990
2                                                      18.463897
3                                                      27.140633

Indicator Name  Beneficiary incidence in 2nd quintile (%) -All Social Protection␣
 ↪and Labor  \
0                                                      27.219161
1                                                      24.549080
2                                                      22.707625
3                                                      22.548257

Indicator Name  Beneficiary incidence in 3rd quintile (%) -All Social Protection␣
 ↪and Labor  \
0                                                      25.959206
1                                                      19.085449
2                                                      23.095900
3                                                      19.768343

Indicator Name  Beneficiary incidence in 4th quintile (%) -All Social Protection␣
 ↪and Labor  \
0                                                       8.933579
1                                                      19.540321
2                                                      20.303491
3                                                      15.946250

Indicator Name  Beneficiary incidence in 5th quintile (richest) (%) -All Social␣
 ↪Protection and Labor
0                                                      14.751055
1                                                      12.361159
2                                                      15.429087
3                                                      14.596517
```


Ethiopia: Beneficiary incidence in 1st vs 2nd vs 3rd vs 4th vs 5th quintiles (%) (2004-2018)
Percentage
Year
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
2004
2006
2008
2010
2012
2014
2016
2018
Beneficiary incidence in 1st quintile (poorest)
Beneficiary incidence in 2nd quintile
Beneficiary incidence in 3rd quintile
Beneficiary incidence in 4th quintile
Beneficiary incidence in 5th quintile (richest)

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