writeup

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# Research Design

Research Question How is financial inclusion (e.g., account ownership, saving, borrowing, and digital payments) related to poverty levels across countries with complete data for 2014, 2017, and 2021? Research Objectives To examine the correlation between financial inclusion variables and poverty levels. To control for economic factors like GDP and assess their moderating effect on poverty. To evaluate temporal changes in the relationship between financial inclusion and poverty over the three years. Key Variables Dependent Variable: Poverty Level: poverty\_headcount\_ratio Independent Variables (Financial Inclusion): per\_account\_ownership\_poor: Percentage of poor individuals with a financial account. per\_saving\_poor: Percentage of poor individuals saving in financial institutions. per\_borrowing\_poor: Percentage of poor individuals borrowing from financial institutions. per\_digital\_payment\_poor: Percentage of poor individuals making digital payments. Control Variables: Economic Growth: gdp (log-transformed for better interpretation). Empirical Strategy Model Specification: Use a fixed-effects (FE) panel regression model to control for unobserved, time-invariant country-specific characteristics (e.g., geography, culture). Where:

i: Country. t: Year. 𝛼𝑖: Country fixed effects. 𝛾𝑡: Year fixed effects. 𝜖𝑖𝑡: Error term

1. Balanced Panel Data Analysis Focus your analysis on the 47 countries with data for all three years. This design enables you to apply fixed-effects or random-effects models for a balanced panel, which provides robust insights into the temporal relationships between financial inclusion variables and poverty across years. Advantages: Robust temporal and cross-sectional comparisons. Controls for country-level unobserved heterogeneity. Disadvantages: Reduces the sample size, potentially limiting the generalizability of results. Implementation:

필터링하는 경우 (3개 연도 데이터로 제한): 장점: 균형 패널 데이터를 사용해 분석이 간결하고 해석이 명확합니다. 모든 국가가 동일한 연도 데이터를 가지므로 결과의 비교가 더 직관적입니다. 단점: 일부 국가의 데이터를 제외하면 샘플 크기가 줄어들어 통계적 검정력이 약해질 수 있습니다.

1. Overall Model Insights Dependent Variable: Poverty Headcount Ratio (poverty rate).

Independent Variables:

Financial inclusion indicators: account ownership, savings, borrowing, digital payments. Economic growth variable: Real GDP Growth. Observations: A total of 141 data points.

R² (Explained Variance):

The model explains 17.2% of the variance in poverty rates. Adjusted R² is negative (-0.302), indicating the model struggles to explain the data when accounting for the number of predictors. Conclusion: The model has low explanatory power, suggesting limitations in variable selection or data structure. F-Statistic: 3.703\*\*\* (p < 0.01):

The overall model is statistically significant, indicating that at least one independent variable is related to the dependent variable. 2. Interpretation of Individual Variables (a) Account Ownership (Income, poorest 40%) Coefficient: 0.505 Standard Error: (3.344) p-value: Not significant. Interpretation: Account ownership for the poorest 40% shows a positive relationship with poverty rates (poverty increases as account ownership rises), but the result is not statistically significant. No robust conclusion can be drawn about the effect of account ownership on poverty. (b) Savings (Income, poorest 40%) Coefficient: 0.757 Standard Error: (1.200) p-value: Not significant. Interpretation: Savings behavior shows a small positive relationship with poverty rates, but this result is not statistically significant. Savings activity does not have a clear impact on reducing poverty in this dataset. (c) Borrowing (Income, poorest 40%) Coefficient: 3.524 *Standard Error: (1.807) p-value:* p < 0.1 (significant). Interpretation: Borrowing is positively and significantly associated with poverty rates, suggesting that an increase in borrowing correlates with an increase in poverty. This could indicate that borrowing is not being used effectively or that it leads to higher debt burdens among the poorest populations. (d) Digital Payments (Income, poorest 40%) Coefficient: -3.146 Standard Error: (2.595) p-value: Not significant. Interpretation: Digital payment use shows a weak negative relationship with poverty rates (poverty decreases as digital payments rise), but the result is not statistically significant. The impact of digital payments on poverty reduction is unclear. (e) Real GDP Growth Coefficient: -0.004 Standard Error: (0.034) p-value: Not significant. Interpretation: Economic growth shows virtually no relationship with poverty rates and is statistically insignificant. This suggests that economic growth alone is insufficient to address poverty in the studied context. 3. Key Conclusions Significant Variable:

Borrowing behavior (Borrowing (Income, poorest 40%)) is significantly associated with poverty increases, indicating potential issues with debt management among the poorest groups. Non-significant Variables:

Other financial inclusion variables (account ownership, savings, digital payments) and GDP growth do not show significant relationships with poverty. This might reflect data limitations or that these factors have limited direct effects on poverty rates in the studied context. Model’s Explanatory Power:

The low R² value suggests that the model does not sufficiently capture the drivers of poverty. Including additional variables such as education, infrastructure, or social policies could improve explanatory power. Policy Implications:

Effective borrowing management and financial education programs could help alleviate poverty among the poorest groups. Other financial inclusion activities might need complementary policies to be impactful.