How Do Cross-Country Regulatory Systems Affect Poverty?

Reviewing a World Bank *Policy Research Working Paper*

Introduction

The relationship between regulation and economic outcomes is a longstanding question in economic analysis. Considering the underlying foundations of good regulatory systems—such as their effectiveness at enforcing contracts or permitting business creation—is critical for spurring improvements in economic opportunity. In a March 2019 *Policy Research Working Paper* for the World Bank Group, Simeon Djankov, Dorina Georgieva, and Rita Ramalho (Djankov et al.) examine how "business-friendly" regulations and their enforcement affect poverty at the country level.[1] In the context of the paper, the measures of business-friendly regulations indicate the ease of starting a business, financing its activities, and conducting its operations in relation to regulatory best practices.

The paper conveys two main findings. First, more business-friendly regulatory environments are associated with lower poverty rates. Second, the authors conclude that the findings suggest business creation, spurred by a more favorable regulatory environment, is a key avenue for reducing poverty. Overall, the paper seeks to extend "the evidence on country-level determinants of poverty" by looking into the institutional environment across countries.

While the paper contributes to the literature on how country-level regulatory characteristics affect poverty, it makes strong claims that are not fully supported by the results or methodology. Modifying the analysis could enhance the findings and expand the paper's contribution to the literature on country-level determinants of poverty. Rather than offering a clear path forward to addressing poverty, the paper is better seen as a starting point for further research. This review analyzes the paper's main claims, examines its methodology, and recommends ways to make improvements.

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[1]   The paper was previously published in *Economics Letters* Vo. 165, April 2018, pp. 82-87, https://doi.org/10.1016/j.econlet.2018.02.002.

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Data and Methodology

With a panel data set including 189 countries from 2005 to 2013, Djankov et al. exploit variation in cross-country regulatory measures to "disentangle the link between business regulations and their enforcement and the poverty headcount."[2]

For the main dependent variable, the authors use "the poverty headcount ratio at $1.90 a day (at 2011 purchasing power parity) as a percent of the population,"[3] which is the metric that the World Bank has traditionally used to assess changes in global poverty. The poverty headcount ratio measures the proportion of a population below a certain poverty threshold, such as $1.90 a day. As a robustness check, the poverty headcount ratio at $3.10 a day is also used.

The authors also evaluate how new business formation relates to the indicators of regulation and poverty. Business formation, which serves as both a dependent and independent variable in different specifications, measures entrepreneurial activity by "the number of newly registered corporations per 1000 working-age people."[4]

The main explanatory variables are derived from the World Bank's *Doing Business* project, which has an index called the "Ease of Doing Business Score" to measure regulatory performance over time across countries and regions. The overall score and four indicator scores are included as specific measures of business regulation as a "proxy for the regulatory attitude of governments."[5] Specifically, five different measures from the project are used:

1. Aggregate Doing Business score (a composite measure of 10 distinct indicators);
2. Starting a business;
3. Acquiring licenses (i.e., "Dealing with Construction Permits");
4. Getting credit;
5. Enforcing contracts.

These independent variables focus on "indicators of property rights,"[6] while the other independent variables control for the following cross-country and regional differences: income per capita, changes in political power, government expenditures, mortality rates, population growth, and inflation. The authors conduct a series of multivariate regressions with year and regional fixed effects.

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[2] Djankov, Simeon, Dorina Georgieva, & Rita Ramalho (2019). "Business Regulations and Poverty." *World Bank Policy Research Working Paper* no. 8763 (March). p. 2. http://documents.worldbank.org/curated/en/355791551471887623/Business-Regulations-and-Poverty.

[3] Ibid. p. 2.

[4] Ibid. p. 4.

[5] Ibid. p. 3.

[6] Ibid. p. 2.

Results and Authors' Conclusions

The core results from the paper are contained in Tables 3, 4a, and 4b. Table 3 reports the results when poverty is regressed on the five measures of business regulation and the other control variables. Of the explanatory variables, only *getting credit* and *enforcing contracts* have coefficients that are statistically significant (at the 10% and 1% levels, respectively). Below is a condensed version of Table 3 that highlights the explanatory variables.

Table 3: Poverty and business regulation

Dependent variable: Poverty headcount ratio

Variables	[1]	[2]	[3]	[4]	[5]
Doing Business index	−0.048				
	{0.07}				
Starting a Business		−0.010			
		{0.024}			
Acquiring Licenses			−0.021		
			{0.024}		
Getting Credit				−0.032*	
				{0.017}	
Enforcing Contracts					−0.192***
					{0.059}

Standard errors in braces below each coefficient; each specification includes controls, year fixed effects, and regional fixed effects.

$*** p < 0.01, ** p < 0.05, * p < 0.1$

Snapshot of results. See Djankov et al. (2019) p. 7 for full results.

Tables 4a and 4b together evaluate the hypothesis that "the relationship [between lower poverty and business-friendly regulations] goes through increased rates of new business formation in countries with improved regulation."[7] Table 4a tests the relationship between new business formation and the business regulation scores, with business formation as the dependent variable. The scores for the overall index, *starting a business*, and *acquiring licenses* have statistically significant associations with new business formation at the 1% level. Table 4b includes the poverty headcount ratio as the dependent variable and business formation as an explanatory variable along with controls. While the association between the two variables is negative in each specification, none of the coefficients are statistically significant at the 10% level or better. Below are condensed versions of Tables 4a and 4b.

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7 Ibid. p. 8.

Table 4a: Poverty and business regulation

Variables	[1]	[2]	[3]	[4]	[5]
Dependent variable: New Business Formation					
Doing Business index	0.0839***				
	{0.0234}				
Starting a Business		0.0237***			
		{0.00729}			
Acquiring Licenses			0.0329***		
			{0.00833}		
Getting Credit				0.0049	
				{0.00568}	
Enforcing Contracts					0.00522
					{0.0165}

Standard errors in braces below each coefficient; each specification includes controls, year fixed effects, and regional fixed effects.

∗∗∗ p < 0.01, ∗∗ p < 0.05, ∗ p < 0.1

Snapshot of results. See Djankov et al. (2019) p. 9 for full results.

Table 4b: Poverty and new business formation

Variables	[1]	[2]	[3]	[4]	[5]	[6]
Dependent variable: Poverty headcount ratio						
Business Formation	−0.0319	−0.0751	−0.0806	−0.0912	−0.0756	−0.0704
	{0.109}	{0.110}	{0.110}	{0.110}	{0.109}	{0.108}
Income per capita		−4.048***	−3.800***	−3.585***	−3.547***	−3.591***
		{0.875}	{0.896}	{0.902}	{0.892}	{0.884}
Govt Expenditures			−0.0561	−0.0719	−0.0451	−0.0829
			{0.0556}	{0.0561}	{0.0559}	{0.0573}
Mortality				0.0287**	0.0311***	0.0321***
				{0.0113}	{0.0112}	{0.0111}
Population growth					2.116***	2.111***
					{0.628}	{0.623}
Inflation						−0.0647***
						{0.0248}

Standard errors in braces below each coefficient; each specification includes controls, year fixed effects, and regional fixed effects.

∗∗∗ p < 0.01, ∗∗ p < 0.05, ∗ p < 0.1

Snapshot of results. See Djankov et al. (2019) p. 10 for full results.

The paper concludes that it finds "empirical support for the association between the poverty headcount and business-friendly regulation," corroborating earlier studies that evaluated aggregate

poverty measures with institutional factors.[8] Furthermore, the authors suggest that business formation is the "likely conduit" for the relationship between poverty and regulation, since new businesses generate jobs and expand economic opportunities.[9]

Strengths: Addressing a Critical Research Question

While short and succinct, the paper's core strengths are the importance of its research question and its utilization of multiple explanatory measures of regulation.

First, the paper focuses on a critical research question that benefits from additional investigation. Understanding the underlying factors that affect poverty and how it can be effectively mitigated is a key priority of economic development. Exploring the question empirically not only contributes to the academic literature but also could offer practical ways to address a problem that exists across the world.

Second, the decision to utilize the specific measures as explanatory variables along with the composite measure is beneficial, especially because of the limitations of constructing and interpreting composite indexes. Since the different indicators making up the composite score often demonstrate significant heterogeneity, the overall index's results may not be as informative as the more specific measures. Additionally, the choice to incrementally substitute the five measures of regulation across the different regression specifications assists with evaluating how the measures intersect with the baseline correlations established in Table 2.[10]

Methodological and Interpretative Limitations

Nevertheless, several limitations weaken the paper's results, including its methodological approach and its interpretation of the statistical significance of coefficients and the magnitude of effects.

First, the conclusion claims that the findings provide empirical support for the regulation-poverty association with business creation as its likely conduit; however, the regression results do not support such strong claims. In short, the paper's methodology is not designed to test the mediate effect of business creation. Approaches exist for modeling how a mediating variable underlies the relationship between an independent and a dependent variable. Mediation analysis often follows a specific series of steps, but the paper runs separate regressions without providing a model to test whether business creation is a mediating variable between regulation and poverty reduction.

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[8]   Ibid. p. 11.
[9]   Ibid. p. 11.
[10]   Table 2 focuses on the correlates of the level of poverty by regressing the poverty headcount ratio on a set of control variables. *See*, Djankov et al. p. 6.

Second, the paper's interpretation of the results could be improved. In Table 3, the majority of the associations between poverty and the index variables—the composite score, *starting a business*, and *acquiring licenses*—are not statistically significant at the levels conventionally used in economic research. Statistical significance speaks to the likelihood of whether the association between the dependent and independent variable is truly different from zero.[11] Only *getting credit* and *enforcing contracts* exhibited a statistically significant association, indicating that those results provide stronger evidence of a true relationship.

But as recent articles have pointed out, using statistical significance as a yes or no determination of whether an observed effect matters has substantial problems. Thus, looking to the magnitude of the observed effect is also a useful practice to consider when interpreting results.

In Table 4a, the regulatory variables that were not statistically significantly in Table 3 are now statistically significant (and vice versa). In other words, the measures that are more closely associated with business formation appear to be different from the measures associated with poverty. But the magnitude of the effects are relatively small—across all five measures, a 10 unit improvement in the index[12] is associated with less than one newly registered corporation per 1000 working-age people.

Table 4b indicates that business formation is negatively associated with poverty in every specification, although none of those relationships are statistically significant. Furthermore, even if this represents a true association, it is unclear how to interpret the magnitude: one newly created business (per 1000 people) is associated with less than a 0.1 percentage point reduction in the poverty headcount ratio.[13] For context, the world total poverty headcount ratio in 2013 was 11.17, with substantial variation across regions.

Overall, while the results may be consistent with the existing literature, they are not strong enough to corroborate the regulation-poverty association. In particular, labeling new business creation as the "likely conduit" between business regulation and poverty is tenuous because those coefficients might not be statistically different from zero, the indicators associated with business formation were different from those associated with poverty, and the effect sizes are either relatively small

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[11] The p-value conveys the probability of observing at least as extreme results given that the null hypothesis (e.g., no association) is in fact true. Generally, a coefficient is deemed statistically significant if the p-value is below a certain threshold. The most commonly used thresholds is below 0.05 (i.e., 5% significance level). Many papers also report whether a p-value is below 0.01 (1% significance level) and 0.1 (10% significance level).

[12] Because the *Doing Business* score is reflected on a scale from 0 to 100, a 10 unit increase in the score can also be thought of in terms of a 10 percentage point increase. *See*, the World Bank's explanation of the Ease of Doing Business Score data for an example.

[13] Since the poverty headcount ratio is the proportion of the population below the $1.90 threshold, the theoretical range of values is 0 (the entire population above the threshold) to 100 (the entire population is below the threshold), when expressed as a percentage. Thus, the regression coefficients can be reasonably interpreted in terms of percentage point differences. For an example of interpreting the ratio in percentage points, see the press release, "Decline of Global Extreme Poverty Continues but Has Slowed: World Bank."

or not clearly interpreted. Put simply, the evidence of a strong association is weak, and additional steps should be taken to more rigorously test the relationship.

Recommendations

Rather than being characterized as providing empirical support for the authors' hypotheses, the paper would be better framed as a starting point for further exploration on these issues. What follows are suggestions to enhance the paper's contribution.

First, describing the magnitude of effects in more detail—and contextualizing their uncertainty— would be beneficial in laying the groundwork for future research. For instance, what do the results seem to indicate about small increases in the index scores? What about large increases? What do the trends look like for certain countries or regions over time?

To create an approximate benchmark for exploring the magnitude of these effects, I used the *Doing Business* index to compare the composite scores of countries that were approximately 10 units apart—arguably a substantial difference. A 10 unit change in the overall *Doing Business 2019* score is roughly the difference between New Zealand (the top-rated country with a score of 86.59) and Poland (ranked 33rd at 76.95), Portugal (ranked 34th at 76.55), or the Czech Republic (ranked 35th at 76.10).[14] Comparing those differences with the regression estimates in Table 3, a 10 unit improvement in the score was associated with less than a 0.5 percentage point decline in the poverty headcount ratio for four of the five measures. The exception, *enforcing contracts*, was associated with a 2 percentage point reduction in the poverty headcount ratio.[15] In other words, a 10 unit increase in a country's *Doing Business* score appears to be substantial, but the regression estimates indicate that a 10 unit increase is only associated with a relatively minor decrease in the poverty headcount ratio for most of the specifications.

Second, the paper should expand the discussion of results to better analyze important trends and relationships. One intriguing observation that is left unexplored is that the explanatory variables with statistically significant results do not overlap across Tables 3 and 4a. In other words, *getting credit* and *enforcing contracts* are statistically significant in Table 3 (with the poverty headcount ratio as the dependent variable), while the composite index, *starting a business*, and *acquiring licenses* are statistically significant in Table 4a (with new business formation as the dependent variable). The paper should include a detailed discussion to aid in interpreting why the indicators most closely associated with poverty are different from those closely associated with business formation.

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[14] Using the 2019 version of the *Doing Business* score calculator, I selected the country (Portugal) with the score closest to a 10 unit difference from New Zealand, along with the countries ranked immediately above and below Portugal. *See*, the *Doing Business 2019* ease of doing business score calculator.

[15] Djankov et al. p. 8.

Third, the paper should discuss alternate variables to evaluate and other explanations consistent with the results. For that purpose, reporting the goodness of fit (i.e., the R-squared) in each table would be helpful to show how much of the variation in the dependent variable is explained by each specification. Similarly, reporting the regional dummies would show cross-sectional differences by region, which could provide additional useful information. Reporting such information could assist with determining other meaningful variables affecting the outcomes and spur future research questions.

Notably, the working paper was initially published in a short-form journal, *Economics Letters*, which constrained the range and length of discussion topics. However, exploring these areas for further analysis remains important. In sum, implementing some of these recommendations could enhance the paper's contribution to the literature on how country-level factors—specifically regulatory quality and business formation—affect poverty.