INADEQUATE TOOLS AND POLICY CONSEQUENCES: AN ANALYSIS OF POVERTY IN THE DEVELOPING WORLD

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***ABSTRACT*:** *This paper examines the global trends in poverty reduction in the developing world between 2000 and 2010. It adopts several measures of poverty and investigates their relationship to multiple economic, social and political factors. Using data from the World Bank, the analysis of this paper provides evidence that none of the factors reviewed can be confidently ascribed credit for reductions in global poverty. It also argues that the conceptual issues with poverty measurements casts doubt over their applicability in analysis. Noting this, it concludes with a discussion on the policy consequences that these measures can have and calls for more comprehensive methods of measuring poverty.*

Keywords: *Poverty, developing-world, World Bank*

INTRODUCTION

In the year 2000, the United Nations met at its Millennium Summit, where it agreed upon the Millennium Declaration. It was signed by all 191 member-countries at the time, and 22 international organizations. The Declaration set forward the Millennium Development goals, with the aim to complete them by 2015. The premier ambition of the Millennium goals was to fight poverty. The first of the 8 goals was to "eradicate extreme poverty and hunger", aiming to "halve, between 1990 and 2015, the proportion of people living on less than a $1.25 a day" (United Nations Millennium Declaration 2001). That target was met, but the question of what caused this global reduction in extreme poverty remained open to debate (World Vision International 2015). While it is unlikely that a single economic, social, or political force is responsible, a combination of such factors may lend an insight into what may, and may not, be contributing to such a development. With such knowledge global solutions to poverty might be revealed. However, in order to truly alleviate poverty, there must be a clear way to define and measure it, and as this paper will show, that definition can be difficult to establish.

METHODS

This paper investigates changes in poverty in the developing world over the course of ten years from 2000-2010. It adopts a few selected measures of poverty and its change and seeks to establish what, if any, aspects of society contribute to poverty mediation. This analysis is based on 31 selected countries, shown in Figure 1 and Table 1. These countries were chosen from an original random stratified sample of 35, which was reduced to 31 according to the availability of data, to ensure as even a representation as possible across the developing world – countries with a population under one million were excluded from the set. Thirty-one was kept as an acceptable number as the sample size was chosen with the expectation that some countries would have to be excluded due to insufficient data, and a belief that adding sample countries after the initial sampling might increase selection bias. Additionally, 31 was deemed a more manageable sample size compared to the entirety of the developing world for this size of analysis.

The distinction of what classifies as a developing country was based on the United Nations country-classifications in the World Economic Situation and Prospects 2012 report (see references). Countries grouped as "developing" and "in transition" were classified as developing for this analysis. Using data from the World Bank, data on poverty were compared to other economic and political factors. By comparing socio-economic factors, this paper seeks to identify the interactions among key variables. Such factors included GDP, exports, Foreign Direct Investment, the shares of wealth for the top and bottom population quintiles, and data on the Human Development Index and Freedom House ratings. This was done by analyzing available data using linear regression analysis. All results are shown in Table 2.

The main focus of this research project was the quantitative analysis of poverty, and in order to analyze poverty quantitatively it must first be measurable. Therefore, this paper explores a few different measurements of poverty. The World Bank provides a measure at $1.90 per day in 2011 purchasing power parity, addressing the Millennium goal of halving "extreme poverty". Due to its relationship with extreme poverty, this paper will adopt this

Table 1: Sample Countries

Country	Change in Poverty at $1.90 Per Day 2000-2010
Belarus	-100
Kazakhstan	-98.86
Thailand	-94.50
Russia	-93.33
Iran	-89.84
Jordan	-87.38
Vietnam	-87.01
Ecuador	-74.96
Peru	-74.62
Pakistan	-71.10
Mexico	-65.45
China	-65.01
Argentina	-64.04
Brazil	-54.63
Dominican Rep.	-52.20
Colombia	-50.25
Chile	-49.26
South Africa	-48.17
Bangladesh	-45.11
Paraguay	-37.03
Philippines	-34.93
Ethiopia	-34.72
Mali	-18.42
Georgia	-14.76
Mozambique	-14.46
Nigeria	-8.54
Angola	-6.66
Guinea	-2.45
Guatemala	13.96
Cote d'Ivoire	19.19
Zambia	84.68

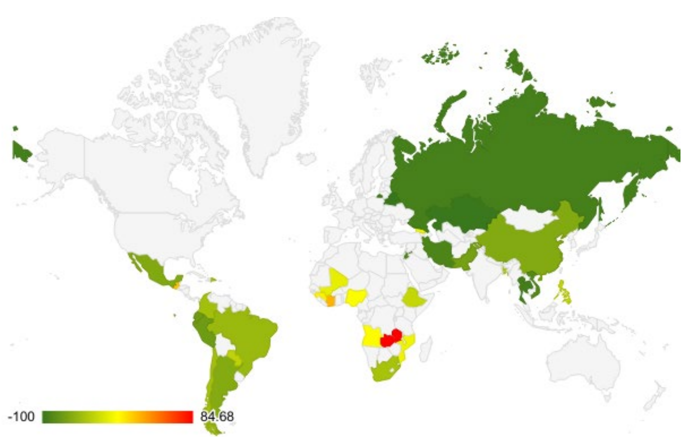


Figure 1: Change in Poverty at $1.90/day 2000-2010.

scale. However, this measurement has issues with comparability between nations as the purchasing power of two dollars is different in each one. Therefore, additional scales are needed. Another possible way to measure poverty is using a country's own nationally determined poverty rate. This method provides a greater amount of nuance, but is often subject to bias and subjectivity by the determining government. A state may establish a poverty line based on criteria that are not congruent to other countries. Additionally, this scale lacks sufficient data and so will only be used sparingly. In order to complement these measures, this paper will also analyze the change in the share of wealth for the bottom 20%. A wealth-share scale can better address the general economic position of the poor, and has a more accurate applicability across national lines. This method, however, lacks the specification needed to address poverty as a condition and so cannot be relied upon by itself. Despite the shortcomings of each method, applying multiple scales can provide a more comprehensive analysis than a single scale would be capable of providing. The inadequacies of current poverty measurements will be discussed in greater depth later in this paper.

Table 2: Linear Regression Results

Independent Variable 2000-2010	Dependent Variable 2000-2010	Adjusted R-Square
Percent Change in GDP Per Capita	Poverty at $1.90/day	-0.023
Percent Change in GDP Per Capita	Wealth Share of the Bottom 20%	-0.022
Change in Exports as a Share of GDP	Poverty at $1.90/day	0.054
Change in Exports as a Share of GDP	Wealth Share of the Bottom 20%	0.102*
Change in Exports as a Share of GDP Per Capita	Poverty at $1.90/day	-0.025
Change in Exports as a Share of GDP Per Capita	Wealth Share of Bottom 20%	0.014
Percent Change FDI	Poverty at $1.90/day	-0.028
Percent Change FDI	Wealth Share of the Bottom 20%	0.142*
Change in FDI as a Share of GDP	Poverty at $1.90/day	-0.031
Change in FDI as a Share of GDP	Wealth Share of the Bottom 20%	0.071
Share of GDP that was FDI 2010	Poverty at $1.90/day	-0.029
Share of GDP that was FDI 2010	Wealth Share of the Bottom 20%	0.088
FDI Per Capita 2010	Poverty at $1.90/day	0.090
FDI Per Capita 2010	Wealth Share of Bottom 20%	0.0278
HDI 2010	Poverty at $1.90/day	0.382**
HDI 2010	Wealth Share of the Bottom 20%	0.019
Change in HDI	Poverty at $1.90/day	0.157*
Change in HDI	Wealth Share of the Bottom 20%	0.002
Freedom House Rating 2001	Poverty at $1.90/day	-0.033
Freedom House Rating 2001	Wealth Share of the Bottom 20%	0.013
Wealth Share of the Top 20%	Wealth share of the Bottom 20%	0.546**
Wealth Share of the Bottom 20%	Poverty at $1.90/day	0.002
Wealth Share of the Bottom 20%	National Poverty Rate Change	-0.045

*F significant at 95% confidence level, **F significant at 99% confidence level

Source: World Bank Open Data

RESULTS

Causes of Poverty Reduction

Setting criticism aside, almost every country sampled saw a decline in extreme poverty ($1.90 per day) between 2000 and 2010. Based on this measure, only three of the 31 countries sampled – Guatemala, Zambia, and Cote d'Ivoire – saw an increase in poverty by this measure (Figure 1 and Table 1). These divergences may be explained by contemporary events. Guatemala had recently seen the end to a thirty-year civil war in which 200,000 people were killed (PBS News Hour 2011). Ravaged by war for three decades, it is likely that the poor would continue to suffer from such civil strife even after its end. Similar circumstances befell the people of Cote D'Ivoire. A civil war broke out in 2002 that split the country in two. Most of the fighting ended in 2004, but the country remained split, and erupted back into a second civil war in 2010 which forced half a million people to flee the country (BBC 2018). Furthermore, Zambia suffered from a catastrophic AIDS epidemic, affecting 19.95% of the population in 1999. The effects of this epidemic were economically severe, with two-thirds of households who lost a father (70% of recorded urban deaths) seeing their monthly income decline by more than 80% (Namposya-Serpell 2000). This economic damage likely explains Zambia's rapid increase in poverty at $1.90 per day. However, none of these factors can be substantively given credit for increases in poverty alone, and should only be seen as part of many possible explanations for such trends.

This general reduction in extreme poverty poses the question of what was causing this decline. The first and most obvious factor to investigate is GDP growth. An expanding economy should mean more wealth for everyone – at least in theory. However, this was not necessarily the case. As displayed in Table 1, the data show that there is little or no correlation between economic growth and extreme poverty reduction. A similar analysis with the percent change in the share of wealth for the bottom 20% of the population produced similar results. Not only was economic growth not a guaranteed path towards reducing extreme poverty, but it was manifestly failing to increase the well-being of the poorest portion of the population. These results seem to corroborate the aforementioned reservations concerning a standard income threshold for poverty.

This calls into question the rhetoric of organizations such as the International Monetary Fund, who argue that the best way to tackle poverty is to expand trade as a way of increasing economic growth. The IMF (2001) claims that:

> *"Further trade liberalization in these areas particularly, by both industrial and developing countries, would help the poorest escape from extreme poverty while also benefiting the industrial countries themselves."*

Naturally, the next question to ask pertained to the effect of trade on poverty. To answer this, data were collected on the change in the share of GDP that was exports. No relationship between exports as a share of GDP and extreme poverty was found. Nor was a relationship found with the change in exports per capita. However, there was a significant inverse correlation between increasing the share of exports that was GDP, and an increase in the share of wealth for the bottom 20%. This seems to suggest that increasing exports is not a path to improving the share of wealth, and may even be detrimental to that cause. The results are questionable though, as the adjusted R-squared for this test was only 0.102. Despite this, Figure 2 shows that the distribution of data points follows a general inverse trend, providing some grounds to this finding. Further research and more sophisticated analyses are required to corroborate the significant correlation, but the data does suggest that exports have either no positive impact on poverty or possibly a negative impact on poverty. While this does not address all of the aspects of trade, it does challenge the concept of export focus for economic development.

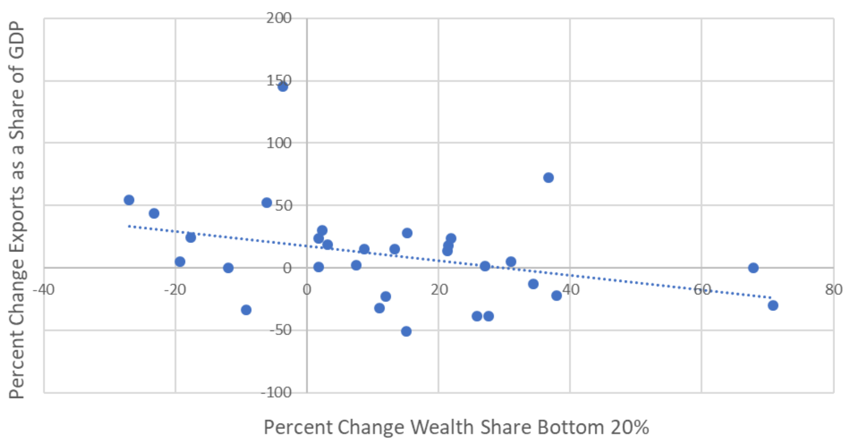


Figure 2. Percent change in wealth share, bottom 20% vs. percent change in exports as a share of GDP, 2000-2010.

Often discussed along the same lines as GDP growth and export focus is foreign direct investment, or FDI. The logic behind FDI is similar: the more money flowing into a country, the wealthier the country and its people will become, thus reducing poverty.

The data, presented in Figure 3 show that total FDI during this decade saw an expansion of foreign capital being invested in the Developing World. With hundreds of billions of dollars' worth of capital flowing across the globe it could, potentially, be assumed that some discernable benefit would be reaped by the poor of the countries involved. If we are to believe that it is the introduction of foreign capital that is the solution to poverty then FDI must show some connection to improving the condition of the poor. This may be a rational assumption; but without empirical support, theoretical principles are nothing but wishful thinking. Indeed, the data show that this is the case.

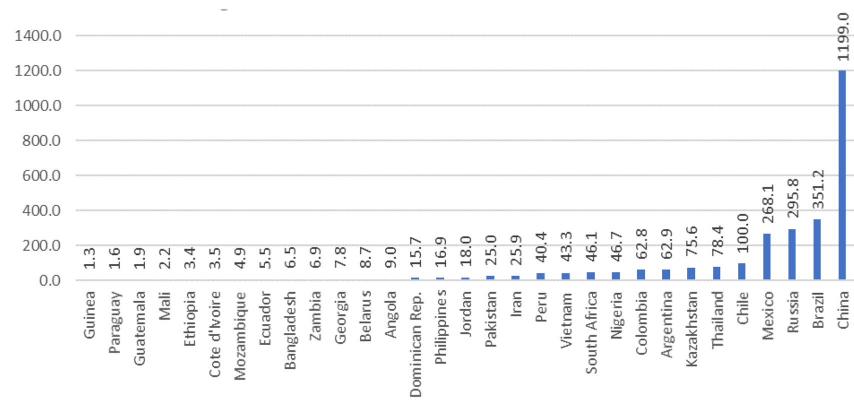


Figure 3. Total FDI in billions USD, 2000-2010.

To examine connections with FDI, measures of poverty were compared with: percent change in FDI, change in FDI as a percentage of GDP, the share of GDP that was FDI in 2010, and FDI per capita. Of these measures, only one produced any significant correlations with either the $1.90 per day or bottom quintile measures. The only test to produce a significant R-square value was the percent change in FDI when compared to the wealth share of the bottom 20%. However, once again, issues arise as to the low value of the adjusted R-square: 0.142. Additionally, Figure 4 shows that the data plots do not create a clear trend, and implies that the significant figure is a product of skewing by the extreme values. Regardless of the legitimacy of this correlation, the lack of associations overall provides evidence that neither changing the amount of FDI, the share of GDP that is FDI, per capita FDI, nor having a higher FDI per capita, has any discernible impact on poverty. These results question the logic behind FDI as an approach to alleviating poverty.

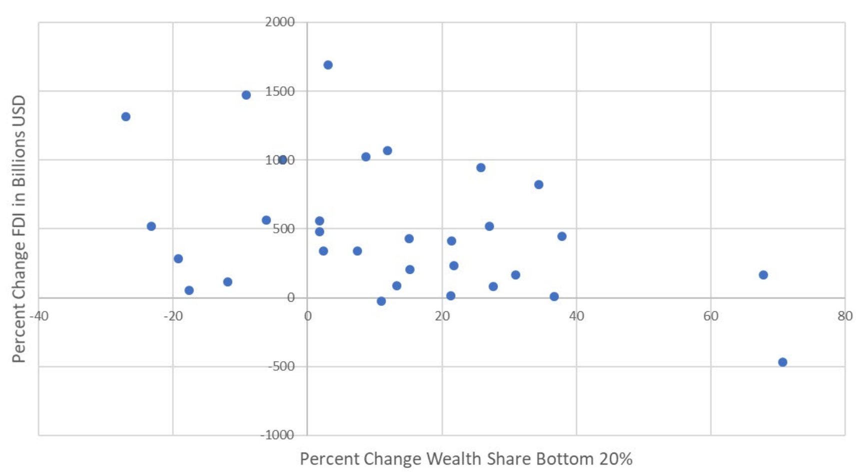
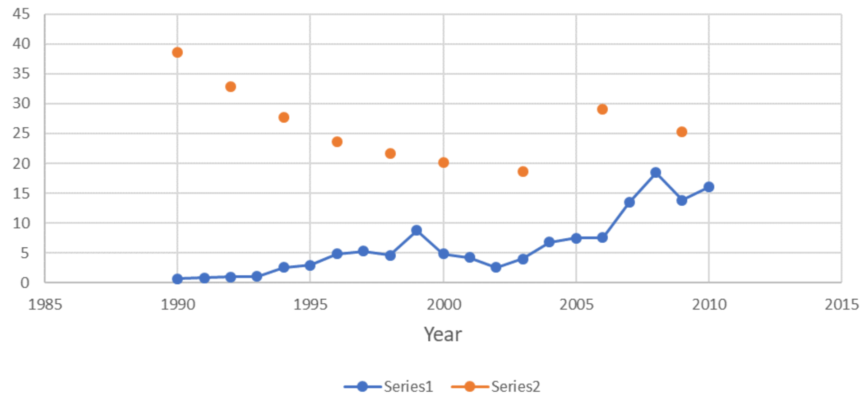


Figure 4. Percent change in wealth share, bottom 20% vs. percent change in FDI
In billions USD, 2000-2010

Chile serves as an example of why this approach is problematic. Chile saw an inflow of one hundred billion US dollars, at $5883 per capita, the highest in the data set. From 2000-2010 Chile saw a reduction in poverty at $1.90 of nearly 50%, and an increase in the wealth share of the bottom quintile of almost 22%. But at the same time there was a 25% increase in nationally defined poverty; and if the timeline is extended, shown in Figure 5**,** it is clear that the overall trend in Chilean poverty predates any meaningful introduction of FDI by at least a decade. This inconsistency is also similarly present in other countries, such as the Dominican Republic. The Dominican Republic saw its extreme poverty reduced by half, and its bottom 20% wealth increase by a quarter; yet its relative poverty increased by 30%, all while nearly $1,600 per capita was being invested. What is supposed to be made of this data? While there are discrepancies between these scales of poverty, it is clear that FDI has an erratic relation to poverty at best.



Series 1 = Annual FDI   Series 2 = Percent Change National Poverty Rate

Figure 5. Annual FDI in billions USD vs. percent change in the national poverty rate, 2000-2010.

Where does this leave FDI as an economic tool for poverty reduction? Clearly, it is not a panacea of poverty reduction as has been touted by economists and academics alike. Even the World Bank's own 2001 analysis of the 1990s, which claims that economic growth and FDI are highly correlated to poverty reduction, states that:

> *"To achieve these positive outcomes for poverty reduction, the environment in which foreign investors operate needs to be right. Otherwise popular criticism of various forms of exploitation practiced by foreign investors may well be right."*

What else can be made of this quote than an admission that FDI will only reduce poverty under exceptional circumstances, with the sly implication that if FDI fails then it must have been a failure on the part of the recipient country, not the investors. The report goes on to say that:

> *"FDI will, indeed, not automatically reduce income inequality. Also, FDI will not deal with all dimensions of poverty. It will mainly promote growth and thereby reduce income poverty. . . The key alternative approaches that might direct more of the fruits of growth to the poor are government-led programs that improve social safety nets and explicitly redistribute assets and income. But these are not alternatives to sensible growth-oriented policies. They are complements. Growth is needed to fund these programs. Moreover, the delivery of social services to the poor - from insurance schemes to access to basic services such as water and energy -- can clearly benefit from reliance on foreign investors."*

The devil is in the word choice: "reduce income poverty," not poverty as a condition. The World Bank is promoting reductions in poverty at a dollar measure without consideration for other measurements.

All of these results so far suggest that our current understanding of poverty, and its resolution, is left wanting. Clearly there is something wrong with the macroeconomic approach to poverty reduction.

Measures of Well-Being

It is possible there are social and/or political factors that are having more of an impact. One broad way of measuring social improvement is through a comparative analysis with the Human Development Index. First examined were the HDI values for 2010, since this year had a complete set of data. No significant relationship was found between HDI in 2010 and change in the wealth share of the bottom 20%. There was, however, a significant relationship between HDI in 2010 and poverty at $1.90 per day. This suggests that countries that are best at reducing extreme poverty have the highest HDI values.

If having a high HDI aids in reducing poverty, then it is possible that improving HDI is the source of this trend. Therefore, examined next was the percent change in HDI over the ten-year time span, omitting Nigeria due to a lack of data. Unsurprisingly there was a significant correlation to change in extreme poverty. Change in HDI produced a significant correlation with poverty at the $1.90 per day measure, supporting the expected result that increasing the overall social wellbeing of society is connected to helping the poor. This correlation was found to be the strangest of all. As shown in Figure 6, the countries sampled distribute into three distinct patterns. The two patterns on the left are separated by continent, with mostly Latin American and European on top and mostly Asian on the bottom – with a few cross placements in both. The right-most group forms an inverse pattern and is made up of entirely African countries. This suggests that HDI's effects on poverty may be continent specific, and that having a higher HDI may be detrimental to the poor in some African countries. A possible explanation for this occurrence is yet to be found. Further research is needed to determine what is causing this extremely unusual pattern.

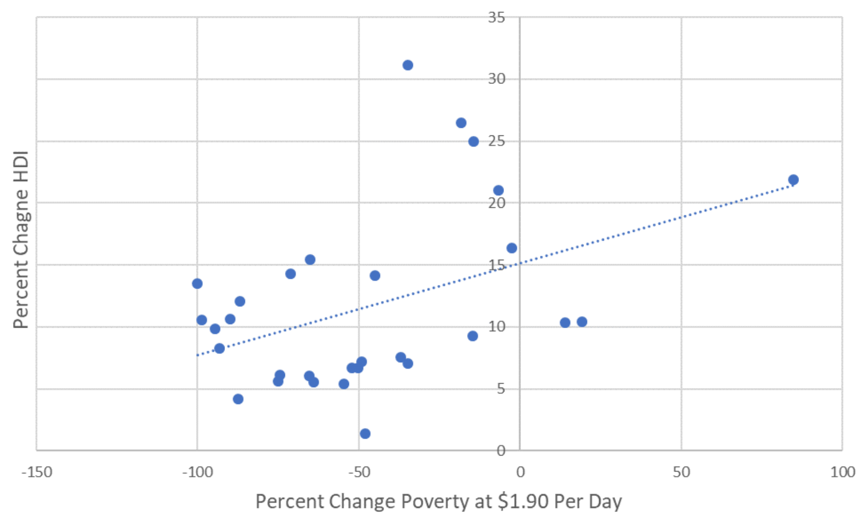


Figure 6. Percent change poverty at $1.90 per day vs. percent change in HDI, 2000-2010.

At the same time, however, there was no relationship with the wealth share of the bottom 20%. This came as a surprise, as it might be expected that improving general social conditions might play a larger role in improving the lives of the poor, but this is not necessarily the case. It appears that HDI may be connected to extreme poverty, but not with poverty above the $1.90 scale. This likely has to do with HDI including measurements of income level, which likely picked up on the decrease in income poverty. Due to the bottom 20% measure being a poverty proxy based on broad wealth distribution trends, HDI was unable to account for it. Additional methods of poverty measurement and more specific tools for measuring social change are needed to more fully understand their relationship to poverty alleviation.

Another variable investigated was the Freedom House rating, as a way of measuring the level of political freedom that exists in a country. The Freedom House ratings from 2001 (values for 2000 were not available) were compared with the change in extreme poverty and with the share of wealth for the bottom 20%. In neither case was any significant relationship found. What this suggests is that political freedom, as defined by Freedom House, does not have any general impact on whether a county will be effective at reducing poverty. Countries that have more political freedoms may allow for the disadvantaged to have a voice in government that can be beneficial to them, whereas countries that are only partly free may suppress the voice of the poor through corrupt government policies and oligarchic structures. As for the most un-free countries, it is possible that a politically repressive regime may seek to reduce poverty as a political maneuver to stem dissent.

For example, Kazakhstan is a country labeled "un-free" by Freedom House (Accessed October 15, 2017). However, this reportedly repressive regime has been more successful at improving the condition of the poor than South Africa, a country with a rating of "free" from Freedom House -- with a reduction in extreme poverty of 99% and 48% respectively. Such results might be due to Kazakhstan's Targeted Social Assistance Program. The TSAP is a decentralized social assistance program enacted in 2002 to provide monetary aid to individuals and families that fall below the poverty line (Electronic Government of the Republic of Kazakhstan 2018). Research by Kudebayeva and Barrientos (2017) attributes this reduction in poverty to rapid economic development in the first half of the decade, and to redistributive policies in the second half. This would appear to show an apparent ability of Kazakhstan to provide a kind of social freedom that many liberal democratic regimes have struggled to provide to their citizens. However, more contemporary research has found these initial gains to have failed to carry into the next decade. According to research by UNICEF (2015), 40% of the country is unable to obtain its basic needs. This is in contradiction to the data from the World Bank which records Kazakhstan's national poverty rate at 2.7% in 2015. The problems with such discrepancies in measurements of poverty will be discussed further in the discussion section of this paper.

The final factor that will be addressed is the effect of income inequality on poverty. In order to analyze inequality, the change in the share of wealth controlled by the bottom 20% was compared to the wealth share controlled by the top 20%. The results obtained showed a strong correlation between reductions in top 20% wealth share and increases in bottom 20% wealth share. If it is assumed that increasing the share of wealth controlled by the poor helps in the reduction of poverty, then inequality would be a major factor in that process. However, further research made this apparent breakthrough short-lived. By comparing the change in the wealth of the bottom 20% to the $1.90 per day, it was discovered that changes in shares of wealth have weak relationships to changes in poverty. Something that appeared to have been more important seems to matter very little.

Additionally, common sense would suggest that improving the wealth share of the poor would reduce national poverty. However, there is no distinct relationship between improvement in national poverty combined with an increase in the share of wealth of the bottom quintile. This shows a weak association between relative poverty and share of wealth of the bottom 20%. An example of this is that Russia saw a decrease in the share of wealth for the bottom quintile by 9%, and a drastic decrease in national and $1.90 per day measures of poverty at 96.8% and 93.3% respectively. How is it possible that a country that is eroding the share of wealth of the bottom fifth of society sees such a radical reduction in poverty?

DISCUSSION

After analyzing these variables and their effect on poverty, only one thing appears to be constant: that nothing really is. One factor that may have a positive relation with one country has a negative relation with another. GDP growth and export expansion, a staple of liberal capitalist arguments on how to reduce poverty, appear to have little to no discernible impact on poverty. The expansion of economic growth through market liberalization has been a prominent talking point for decades for organizations such as the IMF and World Trade Organization. Yet their proposed solutions to poverty seem to lack the data to support their claims. Political freedom data, measured by freedom house, suggests that "freer" countries are more successful at helping the poor. Yet at the same time repressive regimes break that mold, reinforcing the argument that a lack of freedom is not as detrimental to economic security as might be expected. The data also suggest that inequality is tied to the changes in share of wealth of top and bottom quintiles, but that these changes do not necessarily impact poverty in any consistent way. Glaring examples include South Africa and Vietnam. Both countries had seen a nearly 20% decrease in the share of wealth for the bottom 20%, and yet have seen a reduction in extreme poverty of 48% and 87% respectively. The only variable that appears to have a real connection to poverty reduction is HDI. However, that was only with the $1.90 per day measure, and that connection is likely explained by HDI being partly composed of income measures. Additionally, nearly all of the significant relationships discovered had extremely low adjusted R-square values, calling into question whether the models can truly be trusted as predictive.

A possible explanation for these surprising results lies in our conception of poverty. The way poverty is measured lacks a true understanding of what poverty is, and how it should be measured. The $1.90 a day measure may remain unchanged across national lines, but this only helps the people using the data, not the people affected by it. The point of this method is to address differences in currency values and prices. However, this measure of poverty simply averages purchasing power parity for the poorest fifteen countries, then assumes that this applies to the rest of the world. Purchasing power parity is not an inherently false way to measure poverty, but to use an average from a small sample and apply it to the rest of the world makes little sense. Poverty is not something that can be lazily assigned a single number, as the World Bank has done. If purchasing power parity is going to be used, then it must address every country to provide a truly comparable standard. These same issues befall the data on national poverty lines. While national measurements of poverty may be more specific than a dollar a day, they too are prone to error. Different countries have different criteria for poverty, are highly susceptible to measurement error, and often have incomplete data sets. Issues with such data are discussed by Shockley et al. (2017), whose research has evidence that elites in countries, particularly autocratic ones, often report inaccurate data as a means of inflating the success of political and economic policies. The World Bank heavily relies on national reporting but if that data has a propensity to be doctored then it can hardly be relied upon. To try and mitigate these issues, a wealth share scale was included; but this too fails to be effective alone, as it has no real relation to poverty rates and simply classifies a fifth of the population as one homogenous unit.

If poverty is to be reduced across the globe, it is imperative that approaches to defining, measuring, and documenting it be improved. While the results of this paper contradict the claims of the liberal capitalist cult of market liberalization and economic growth, that cannot rest as the final conclusion of this paper. The pursuit of truth cannot be conducted upon a crumbling artifice of flawed tools and inadequate data. Trying to define poverty based on narrow perspectives of consumer baskets and income scales is not only a poor approach, but also a demotion of the poor to mis-measured statistics. A true understanding of poverty must encompass not just income and prices, but also features such as access to education, transportation, clean water, food, shelter, clothing, healthcare, etc. Constructing such a scale sounds like a daunting task, but if organizations like the World Bank planned on taking up such a project they would have done so already. If there are to be any meaningful attempts to reduce poverty, current approaches must be reconceptualized and greater effort must be put into measuring it. Only then can a true understanding of poverty be achieved. Otherwise, there may be consequences to the policies based on these tools.

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