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Eradicating Poverty in Fragile States

Prospects of Reaching the "High-Hanging" Fruit by 2030

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Abstract

As the world approaches the target year of the Millennium Development Goals and passes into the new, post-2015 era, the development community has made a call for a new international development goal of eradication of extreme poverty by 2030. How feasible is that? For most of the developing world, the goal seems ambitious, yet achievable—but what about the prospects for fragile states in which an increasingly large share of the global poor will live (estimated at nearly four in 10 by 2030)? This paper presents a base case scenario with the International Futures model that forecasts a 32 percent poverty rate for fragile states by 2030 given current conditions and trends. The paper considers alternative scenarios to identify a range of possible outcomes. In the most optimistic scenario, the paper steps beyond the search for realistic policy levers and simply assumes exceptional economic growth and decreased inequality for fragile states. This extremely optimistic scenario produces a forecast of a 20 percent extreme poverty rate for this group of countries. The paper then explores the effects of improved institutions and improved security in fragile states and of a set of poverty reduction policies that would be conditional on security and good governance to be effective. The resulting aggressive but reasonably attainable poverty rate in fragile states is 24 percent in 2030. With newly revised Purchasing Power Parity values (rebased to 2011 by the International Comparison Project in May of 2014), the 2030 forecasts of fragile state poverty rates are lower by 5 to 6 percent across all scenarios, still leaving them significantly above the 3 percent threshold for poverty eradication.

Eradicating Poverty in Fragile States: Prospects of Reaching the "High-Hanging" Fruit by 2030

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1. INTRODUCTION

Efforts to reduce extreme poverty in the first decade of the 21st century have been overwhelmingly successful—Millennium Development Goal 1 (MDG1), the global goal of reducing $1.25-a-day poverty by half between 1990 and 2015, was met in 2010 according to estimates by Chen and Ravallion (2012). As 2015 approaches and the MDGs come to a close, attention has now shifted to a new round of global development agenda setting—major voices of international development, led by the World Bank, the United Nations and the United States, have called for the eradication of extreme poverty by 2030.[1] For most of the developing world, poverty eradication (or something close to it[2]) is quite possible. China has reached single-digit poverty rates, and the majority of India's poor are situated very close to the poverty line, ready to cross it in the very near future.[3] Meanwhile, there has been relatively little conversation about the prospects for poverty reduction and eradication in fragile and conflict-affected countries (FCS), with a few notable exceptions[4]. This inattention is driven by three related facts, i) most of the poor have historically been located in non-fragile states[5], ii) fragile states have historically made the least progress on poverty reduction, and iii) development interventions are typically (though not always[6]) more effective in non-fragile environments. In light of these realities, most policy focus over the last decade has been on poverty eradication in the rest of the developing world, where the proverbial fruit is relatively abundant and low-hanging. With a global development goal of poverty eradication, however, the goal is harvesting *all of the fruit* from the tree, both low-hanging and high-hanging, and this paper assesses the feasibility of reaching that high-hanging fruit. We use the International Futures (IFs) forecasting system and a scenario modeling approach to contribute some practical forecasts of likely trends in poverty for fragile and conflict-affected states and some analysis of how policies might impact poverty reduction in these environments.

The paper structure is as follows: The second section identifies the countries considered fragile for the purposes of this analysis, and it provides information on current poverty in these countries and the rest of the developing world. The third section summarizes recent poverty forecasts by other authors and compares to our "base case" estimates, both for the world and for fragile states, where available, to place our analysis in the context of other research. The fourth section presents a "best case" poverty forecast for fragile states based on above average economic growth and lower inequality in these countries. The fifth section explores the effects of improvements in security, institutions and other poverty reduction policies on the forecasts for fragile states. The final section uses findings from the alternative scenarios to assess the feasibility of eradicating poverty in fragile states.

1.1 DEFINITIONS

The fragile states list used throughout this study will be the Fragile and Conflict-Affected Situations (FCS) list for fiscal year 2014, published by the World Bank's Global Center on Conflict, Security, and Development. This list changes on a yearly basis, and a table of historical lists is included in the Technical Appendix. For the purposes of this paper, the poverty rate is defined as the percentage of a population living under the international poverty line of $1.25 per day, and the poverty headcount refers to the number of people living on less than $1.25 a day.[7] Following the global discourse, the term "extreme poverty" also refers to poverty marked by the $1.25 poverty line.

Countries are included on the World Bank Fragile and Conflicted-Affected Situations list if they meet any one of the following criteria: 1) the country currently has, or has had within the last 3 years, a UN peace-keeping operation within its

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[1] Kim (2013), UN (2013), White House (2013), USAID (2014)
[2] World Bank (2013)
[3] Chandy et al. (2013)
[4] Ibid.
[5] Poverty rates on the other hand have been lower typically in non-fragile states; see Edward and Sumner (2012)
[6] IEG Annual Report (2013); for summary findings in fragile states see Hellman (2013) "Surprising Results from Fragile States" (http://blogs.worldbank.org/futuredevelopment/surprising-results-fragile-states)
[7] Chen and Ravallion (2008)

borders, 2) the country currently has, or has had within the last 3 years, a UN political mission within its border, and/or 3) the country has a Country Policy and Institutional Assessment (CPIA) score below 3.2 (averaged with CPIA scores from regional development banks, where available). In more general terms, a country is fragile when it has unstable or underperforming institutions, and these institutions include social networks, business-elite partnerships, and even civil society as a whole, not just government institutions.

2. ON FRAGILE STATES

The majority of people living under $1.25 a day currently reside in non-fragile states. India still has an overwhelming proportion of the world's poor living within its borders, and populous, middle income, non-fragile countries like China, Nigeria, and Bangladesh house most of the world's remaining poor population. Figure 1 shows where the world's poor are currently residing (using 2010 data) and where the poor are likely to reside in 2030.

Figure 1: Developing World Poverty in 2010 and 2030

World Poverty, 2010
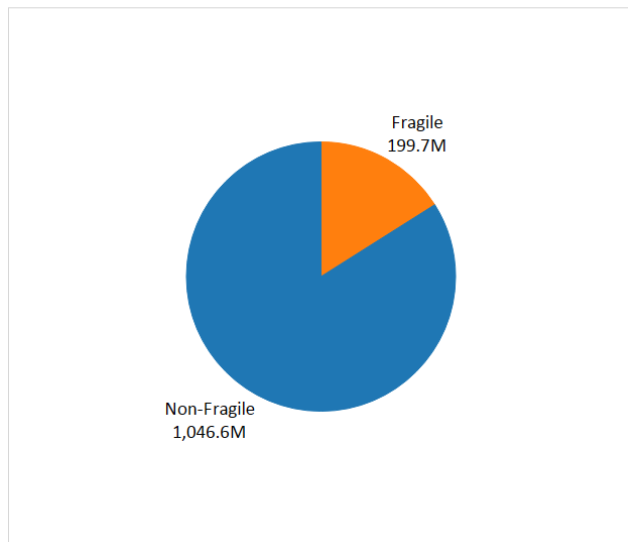
Poverty headcount by country, 2010 estimates. Source: International Futures v7.04

Type
Fragile
Non-Fragile

World Poverty, 2030
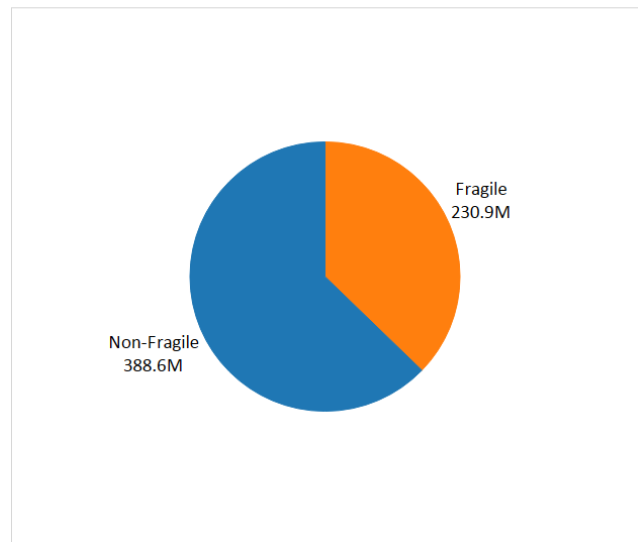
Poverty headcount by country, 2010 estimates. Source: International Futures v7.04

Type
Fragile
Non-Fragile

2.1 POVERTY AND DEVELOPMENT IN FRAGILE STATES

Fragile states do not house the most poor, but the poor are disproportionately located in fragile states as evidenced by the group's high average poverty rate. Figure 2 below shows the poverty rates of fragile states (represented by color), as well as the total poor population within each country (represented by the size of the corresponding bubble). The figure on the left shows the current state of poverty in fragile states, and the figure on the right shows the IFs Base Case forecast of poverty in 2030. Notice that progress in these countries is likely to be relatively slow; many countries remain above a 50% poverty rate and, due to this slow progress and population growth, most bubbles stay about the same or grow in size from 2010 to 2030.

Figure 2: Fragile States Poverty and Distribution, 2010 and 2030
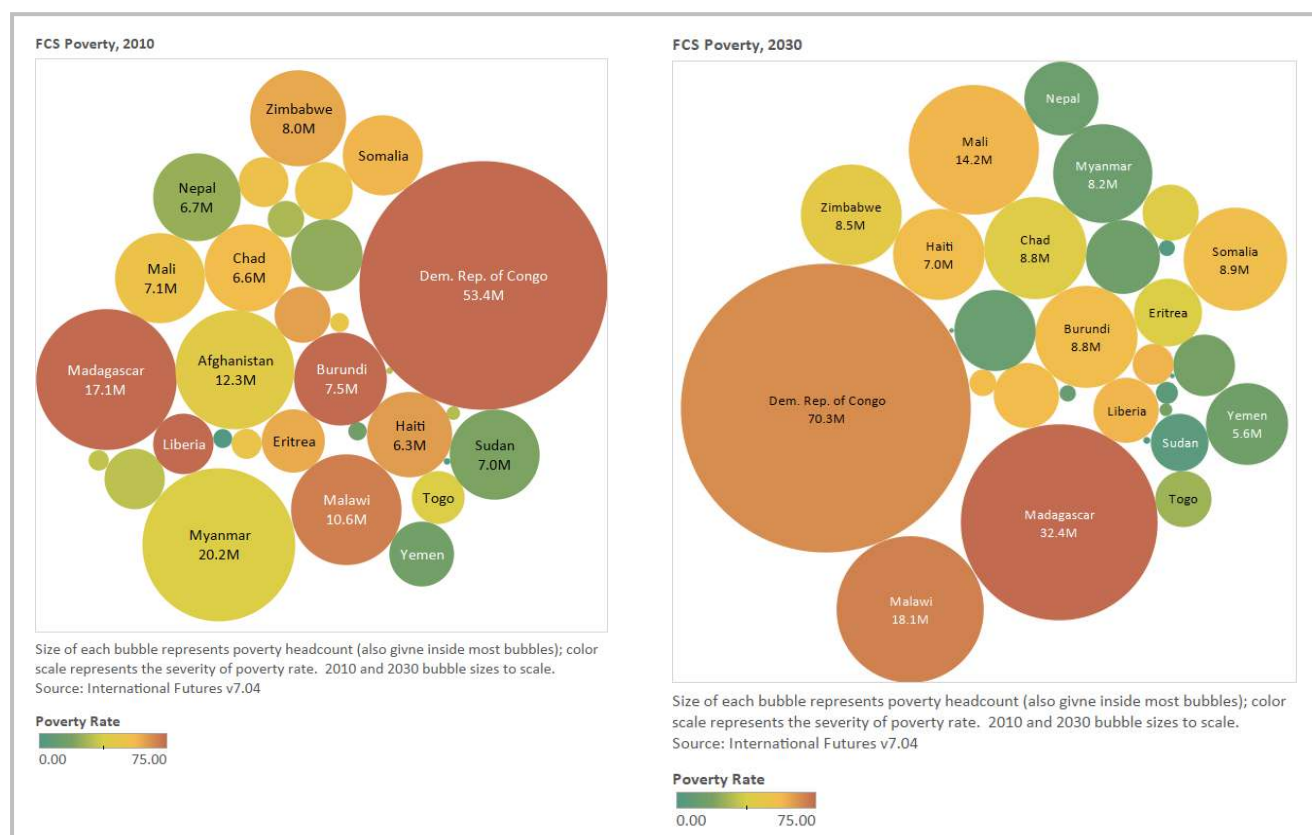
The problem of poverty in fragile states is not confined to just income and economic wellbeing. In addition, fragile states lag behind other countries in terms of social development. According to the 2011 World Development Report:

> "People in fragile and conflict-affected states are more than twice as likely to be undernourished as those in other developing countries, more than three times as likely to be unable to send their children to school, twice as likely to see their children die before age five, and more than twice as likely to lack clean water."[8]

At the time the report was written it was true that no low-income fragile state had yet achieved a single MDG, however progress towards these goals has been made. Since 2011, eight fragile states have been able to meet the poverty goal, Micronesia and Myanmar have achieved gender parity in primary school enrollment, and Nepal has halved the chances of dying in childbirth since 1996. Although these figures do inspire some hope, most fragile states will not meet most of their MDGs by 2015.

2.1 DIVERSITY OF POVERTY IN FRAGILE STATES

Although these countries share elements of fragility, each has a very different socio-political and economic situation. Some countries on this list have been some of the top economic performers among developing countries in the past 15 years. For example, Chad has seen double-digit GDP growth rates in the past decade, largely due to its natural resources. Liberia has also experienced double-digit growth rates, but unlike Chad, this growth has been post-conflict and

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[8] World Bank (2011)

is connected to diversification of the country's economy.   At the same time, others have a recent history of stagnant economic growth, such as the Federated States of Micronesia, Malawi, and Madagascar.[9] Inequality among these countries has a wide range as well—high inequality in Zimbabwe and Central African Republic has been persistent, but countries like Timor-Leste and Burundi rank in the bottom 40 countries in Gini.[10] The scatterplot (Figure 3) illustrates the diversity of socio-economic conditions among the fragile states, as well as the different issues that led to their inclusion on the FCS list.

Figure 3: Diversity of Situations in Fragile States
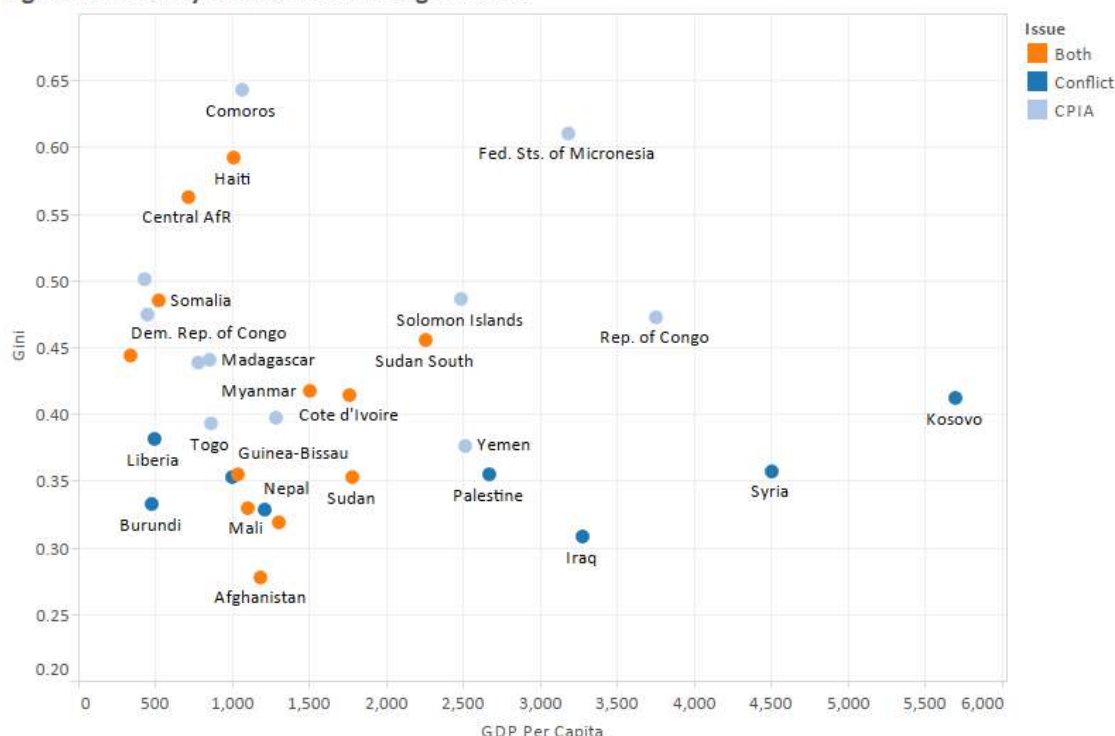
Scatterplot of fragile states, by GDP per capita at purchasing power parity and Gini coefficient, 2010 estimates. Countries omitted from this graph: Bosnia and Herzegovina (Gini: 0.36, GDPPCPPP: $7,290) and Libya (Gini: 0.46, GDPPCPPP: $13,706). Source: International Futures v7.04

3. WORLD POVERTY FORECASTS – COMPARING INTERNATIONAL FUTURES TO OTHER FINDINGS

3.1 THE BASIS OF INITIAL POVERTY ESTIMATES

Poverty estimates vary substantially. Reasons for this variation include periodic revisions of data on purchasing power parity, regular updating of household surveys, and changing specifications of extreme or other poverty levels. Fundamentally, however, poverty figures are based on two types of information. The first is the distribution of consumption or income (consumption is generally preferred), most commonly derived from household surveys like those provided on the World Bank's PovcalNet. The distribution can be represented by deciles of population or summarized in standard analytical forms such as the log-normal density function. The second type of information is the mean value of consumption or income. The household surveys can, of course, also provide such a mean, which then will be inherently consistent with the survey. Alternatively, national account statistics can provide the household consumption mean,

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[9] IMF (2013)
[10] World Development Indicators (2012)

although means from national accounts most often differ from and are typically higher than those from household surveys. Analysts vary in their use of one or the other mean, most often relying on survey values (e.g. Ravallion 2012 and 2013; Chandy, Ledlie and Penciakova 2013: 16); the estimates of Edward and Sumner (2013: 9) use both means separately. The IFs model and this paper initialize forecasts with poverty estimates drawn from the distributions and associated means of the PovcalNet data.

3.2 COMPARATIVE FORECASTING METHODOLOGIES

Forecasts may build on surveys for initial conditions, but involve aggregate variables representing changes in distribution and/or average values of consumption (or income). Focus tends to be on growth of consumption (or of national income or GDP as a proxy) and most analysts use forecasts generated by others (e.g. Chandy, Ledlie and Penciakova, 2013 use those of the Economist Intelligence Unit) or they build upon extrapolations of recent growth rates. For instance, Edward and Sumner (2013: 11-12) look to the recent IMF estimates and forecasts and develop scenarios that extend and/or shift those.[11]

Forecasting changes in income distribution is even more difficult than forecasting economic growth and almost all projections rely on purely exogenous, self-generated assumptions, typically assuming no change (e.g. Ravallion 2012; Chandy, Ledlie and Penciakova, 2013: 17). Because income inequality within countries has been increasing in more cases than not, this may be an optimistic assumption.

Poverty forecasting also provides not just rates of poverty, but headcounts. Most authors use the UNDP medium variant population forecast for their population projections. The IFs system includes its own economic model and forecasts of mean consumption. It assumes log-normal functional distributions of consumption that can also be summarized with Gini coefficients.

3.3 GLOBAL POVERTY FORECASTS: BASELINE AND ALTERNATIVE SCENARIOS

As a result of differences in structure, but also very much depending on the assumptions built into alternative scenarios, global poverty forecasts in 2030 vary by an order of magnitude, from 100 million (1.5%) to 1300 million (15.5%) poor. To better locate the IFs base case forecasts in the current literature, we discuss below each of the approaches, the assumptions underlying each approach and their respective results. Each of the authors gives a baseline, or "business-as-usual" scenario, which is tied to recent trends in inequality and economic growth; the authors also typically provide optimistic and pessimistic scenarios based on varying expectations for future economic growth and inequality.

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[11] Given a common tendency to initialize forecasts with survey data and to drive them with values rooted in national account statistics, there needs to be some attention both to the adjustment of initial discrepancies between the means provided by the two methods (a simple ratio can suffice) and to whether or not those discrepancies will remain constant or change. A common approach is to explore the historical ratios *of growth* in the two sets of means and to posit that ratio's continuation. For instance, Ravallion (2012: 7, footnote 16) discusses forecasts that pass through 90 percent of growth in private consumption per capita from national accounts to survey means, with a much lower number for India (see also Edward and Sumner 2013: 7). Chandy, Ledlie, and Penciakova (2013: 16-17) calculate a general discount coefficient of 0.81 for consumption (0.54 for India). There is an obvious difficulty, however, in assuming that the discrepancy between underlying consumption by households and the value built-into national accounts will continue to grow, and it is a generally pessimistic assumption with respect to future poverty reduction.

Figure 4: Developing World Poverty Forecasts
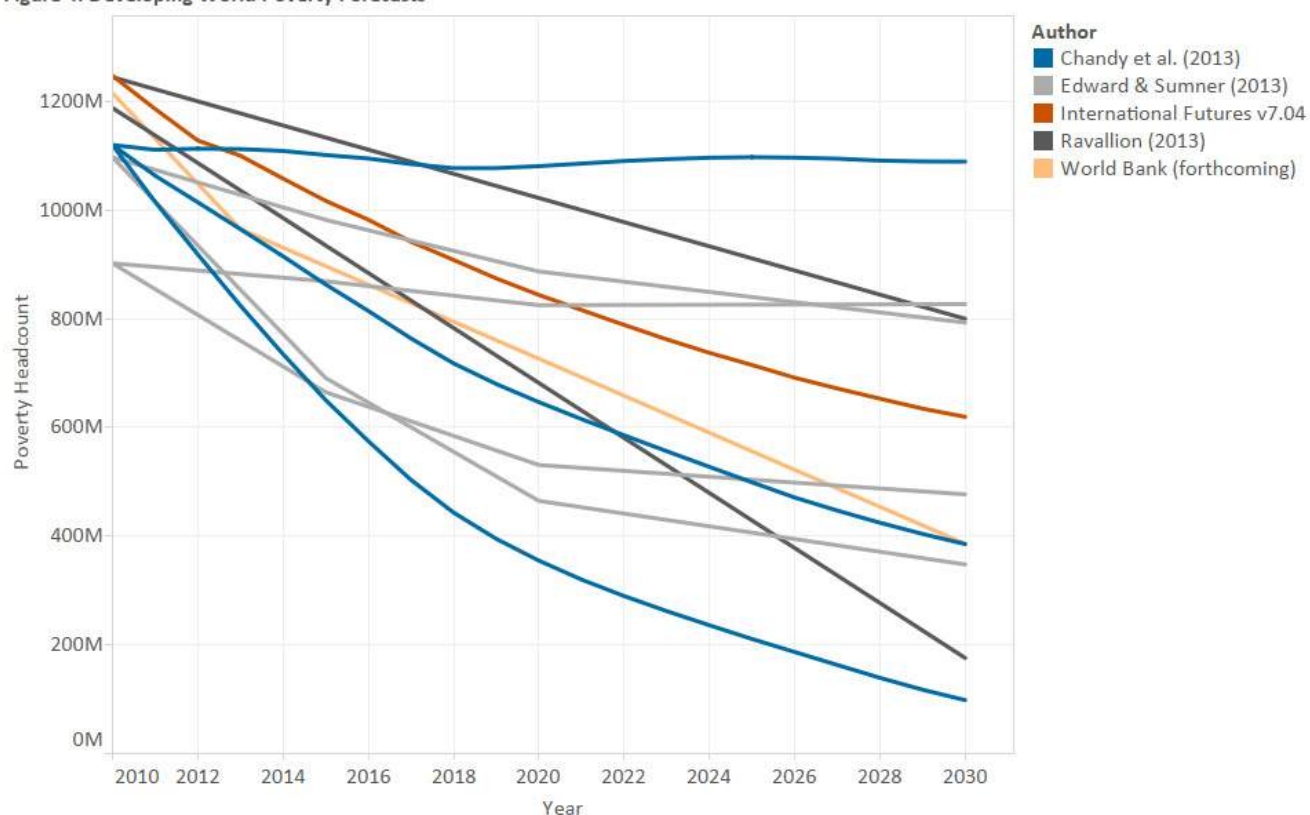
Developing world poverty forecasts from authors referred to in this analysis.

Table 1: Comparative Poverty Forecasts for Developing Countries				
Author/Year	Year & Initial Poverty Estimate	Best Case	Base Case	Worst Case
Chandy, Ledlie, and Penciakova (2013)	2008 1289 million (22.4%)	High growth, better distribution, 2030 – 98.4 million (1.4%)	Continuation of current poverty reduction trends, 2030 – 386 million (5.4%)	Low growth, worsening distribution, 2030 – 1089 million (15.2%)
Edward and Sumner (2013)	2010 Survey Data: 1097 million (19%) NA Data: 902 million (15.6%)	Survey Means, 2030 best distribution, high growth – 305 million (4.3%) NA Means, 2030 best distribution, high growth – 427 million (6%)	N/A	Survey Data, 2030 Current trends distribution, low growth – 1309 million (13.5%) NA Data, 2030 Current trends distribution, low growth – 1134 million (15.5%)
Ravallion (2013)	2008 1289 million (22.4%)	Linear projection, 2027 – 200 million (3.4%) Simulation projection, 2027 – 176 million (3%)	N/A	Linear projection with low growth, 2030 – 800 million (11.2%)
Chen/World Bank (forthcoming)	2010 1214 million (21%)	N/A	Baseline projection – 452 million (6.3%)	N/A
International Futures Model v7.04	2010 1247 million (21.1%)	N/A	Baseline projection – 620 million (7.4%)	N/A

IFs Base Case

The IFs Base Case is not a "business-as-usual" forecast, but rather the model's representation of the dynamic and often non-linear path that countries follow. The IFs model exhibits a few general behaviors in the Base Case that have important implications for the poverty forecasts that follow. First, inequality between states and globally decreases over time but, on average, inequality within developing countries increases (1.5 points between 2010 and 2030 on the 100-point Gini index and a further 1.5 points by 2050). This is an important trend, particularly salient to poverty forecasts over the next 30 years. Second, economic growth per capita among developing countries is fairly stable over the next 40 years. Other socio-economic patterns include decreasing population growth rates in the developed world, decreasing incidence of death attributed to AIDs worldwide, and increasing total aid to developing countries but decreasing aid as a percentage of developing countries' GDP.

Household consumption is derived from the forecasted value for GDP and the forecasted propensity for a population to consume. Population is forecasted based on historical patterns of birthrates, death rates, and flow of net migrants. The forecast of distribution, represented by the Gini coefficient in this case, is based on the forecasted differences in income generation between two subsections of the population—skilled and unskilled households. The crude nature of the Gini forecasting method is a recognized shortcoming of the model and one that can be addressed by specifying Gini forecasts exogenously. A more detailed description of GDP and Gini forecast calculation within the model can be found in the Technical Appendix.

In terms of global poverty figures, the IFs Base Case is not as optimistic as some other baseline forecasts (Ravallion and Chandy et al.). In the IFs Base Case, poverty rate reduction slows gradually for developing countries in the aggregate and slows more sharply after 2020 in fragile states. There are a variety of explanations for this. One is a simple combination of aggregation and saturation effects. The countries with the highest poverty rates tend to be those with the highest population growth rates (such as the Democratic Republic of the Congo, Madagascar, and Malawi). Thus in a population-weighted representation of the fragile state group, while some countries eliminate poverty and, therefore, stop contributing to poverty reduction, the weight of higher poverty, more populous countries becomes greater and raises it. This would suggest that, rather than the global rate of poverty reduction continuing to accelerate as it has over the last 20 years, we will reach a turning point where the change in the rate actually decreases and global poverty reduction slows.

Other explanations for potentially slowing or stalling poverty rate reduction relate to broader characteristics of fragile states, especially again of those that have some of the highest current poverty rates. For instance, the three states mentioned above and many other fragile states have often run large trade deficits as a portion of GDP. The economic model in IFs does not allow such deficits to continue indefinitely, so, within the model, an increase in interest rates and/or reduction in government transfers will squeeze household consumption and limit poverty reduction. Further, the Base Case of IFs also anticipates that foreign aid from high-income countries will not keep up with economic growth in low-income countries, where aid receipts as a percentage of GDP rose quite steadily to about 8-10 percent over a long period of time but have recently begun to decline. We discuss these phenomena and their implications for poverty reduction in section 5.4.

Chandy et al.

In their baseline poverty forecast, Chandy et al. (2013) use consumption growth rate forecasts from the Economic Intelligence Unit and assume unchanged income distribution for the forecast period. The authors' four alternative forecasts are combinations of optimistic and pessimistic inequality and economic growth. Inequality is varied across the scenarios by altering the consumption shares between richest 10% and poorest 40%; i.e. increasing inequality is represented by a transfer of shares from the poor to the rich, and decreasing inequality in represented by a transfer of shares from the rich to the poor. Consumption shares are transferred either to or from the poor at a rate of ¼ percentage point per year.

Optimistic and pessimistic growth rates are tied to the baseline rates from the Economic Intelligence Unit (EIU). The authors decrease the EIU growth rates by two percentage points per year in their pessimistic forecast, and increase the rate by two percentage points for the optimistic forecast.

The optimistic and pessimistic scenarios are applied to the entire developing world, and the authors also analyze fragile states separately in their work. However, their list of fragile states comes from the OECD DAC 2013 annual report on fragile states. This alternative list contains the subset of the World Bank fragile states list, as well as "alert" countries according to the Fund for Peace Failed States Index—resulting in a doubling of the poor population in fragile states relative to the FCS list that we use (see Table 2 below).

EDWARD AND SUMNER

Edward and Sumner (2013) construct their alternative scenarios using three variations each on economic growth and inequality. For inequality, the authors use "static inequality," which holds inequality constant over the entire time period, "dynamic inequality," in which inequality changes based on recent trends, and "best ever distribution," which sets each country's level of inequality to its lowest historical level. Edward and Sumner address the issue of missing inequality data with their Growth, Inequality, Poverty Model (GrIP), which extrapolates trends and fills in missing income distributions. The different variations on economic growth are as follows: Optimistic economic growth is set to the average GDP growth rate given by the World Economic Outlook (WEO) from 2010 to 2017[12], moderate economic growth is set to the WEO rates minus 1% each year from 2010 to 2017, and pessimistic growth is set to half of the growth rates given in the WEO from 2010 to 2017.

Edward and Sumner apply their optimistic and pessimistic scenarios to developing countries and analyze many subsets of these countries, including the World Bank Fragile and Conflict-Affected Situations (FY 2013).

RAVALLION

Ravallion (2012; see also 2013) uses two separate methods to forecast poverty; first he uses simple optimistic and pessimistic linear projections of annual percentage point change in poverty rates. The underlying narrative of Ravallion's linear projections is that developing countries will either continue to reduce poverty at the same impressive rates since the turn of the last century, or revert back to poverty reduction rates of the 1980s and 1990s. Working from this narrative, Ravallion uses a poverty reduction rate of 1% for the developing world to produce an optimistic trajectory. Ravallion then calculates a pessimistic trajectory using a 0.6% poverty reduction rate per year for the developing world while keeping poverty reduction rates in China around 1% per year.

In his second method, he uses a country-level simulation to determine the economic growth rates necessary to reach certain poverty goals. In the simulation, Ravallion works backward from these and other poverty targets to find the growth rate for mean household consumption per capita needed to achieve the poverty reduction target. For example, in the simulation-based analysis he calculates (Ravallion 2013: 14) that mean household consumption per capita would need to increase by 4.5% per year in the developing world, and inequality would need not to rise, to achieve a global poverty rate of 3% by 2027.

Like the works mentioned above, the geographic focus of Ravallion's study is developing countries, but he does not include a separate analysis of his scenarios on any subset of developing countries and the analysis therefore does not include any focus on fragile or conflict-affected states.

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[12] Scenarios are based on scenarios used in Karver et al. (2012); WEO GDP growth rate estimates are assumed to be overly optimistic according to Leo (2009)

CHEN/WORLD BANK [FORTHCOMING][13]

The poverty forecasts forthcoming from the World Bank from Chen closely follow those of Ravallion. Initial poverty estimates come from PovcalNet, and the base, or "Business-as-Usual", forecast is derived from a linear extrapolation of current economic growth rates and constant inequality. The "Business-as-Usual" forecast assumes the average growth from the past 10 years for all developing countries. The more optimistic scenario ("simulation") takes the optimistic growth rate[14] from Ravallion (2013). In the forthcoming work, there is no mention of how inequality is treated in these two forecasts.

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[13] Methodology for Chen/World Bank is based on personal correspondence, and we acknowledge that details regarding the methodology may change substantially from what is presented here in the coming months.

[14] The developing world growth rate given in World Bank/Chen (forthcoming) is 4.2%, but how this rate is applied is not specified (i.e. whether this rate is used as a GDP growth rate (the usual rate represented by "growth rate") or growth in household consumption (as specified in Ravallion (2013)). There is also a slight discrepancy in the rates given in World Bank/Chen (forthcoming) and Ravallion (2013); optimistic rates are given as 4.2% and 4.5% respectively.

3.4 FRAGILE STATES POVERTY FORECASTS

Figure 5: Fragile State Poverty Forecasts
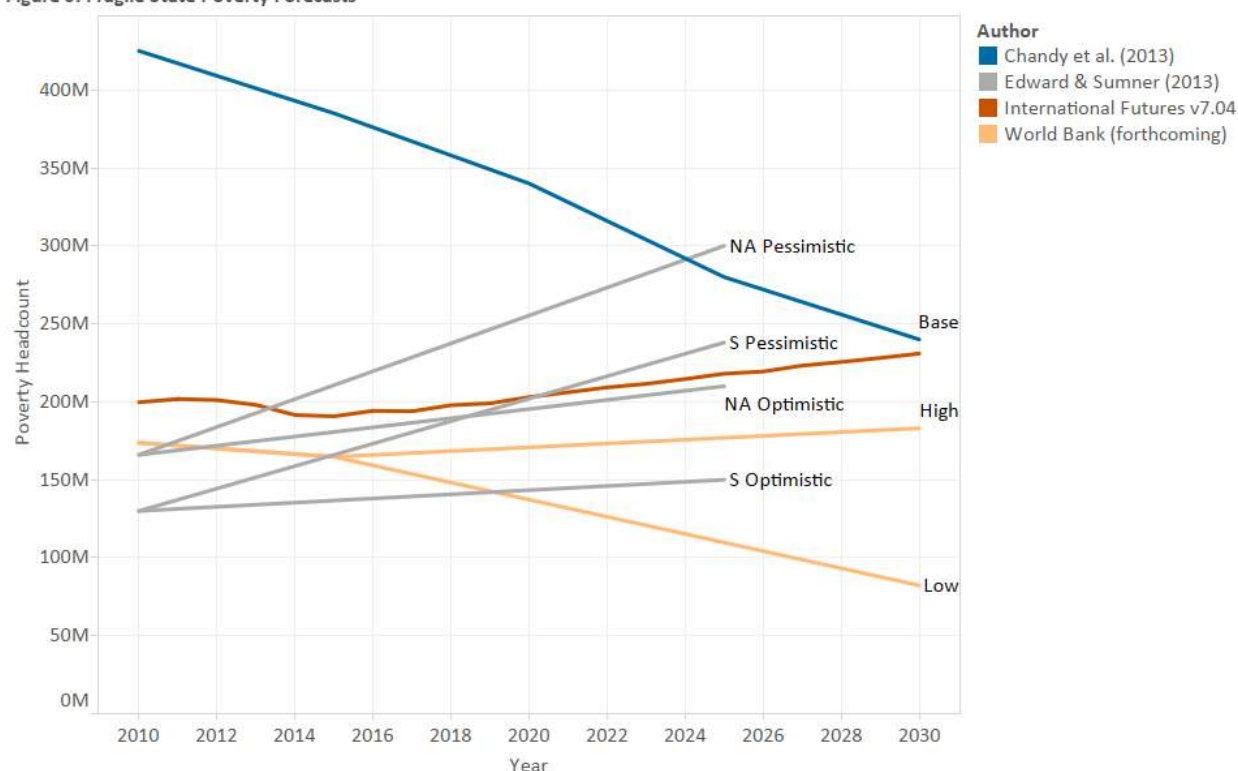
Fragile state poverty forecasts by authors mentioned in this analysis.

Table 2: Comparative Poverty Rate Forecasts for Fragile States				
Author/Year	FCS Poverty Headcount and Rate, 2010	Forecasts[15]	Which fragile states?	% of World Poor in FCS
Chandy, Ledlie, and Penciakova (2013)	(2008) 400 million (36.8%)	2030 Baseline: 240 million (13.4%)	OECD-DAC 2013 Fragile State List	62.2%
Edward and Sumner (2013)	130-166 million (24.8% - 31.7%)	2025 Optimistic: 150–210 million (24.7%-34.6%) Pessimistic: 238-300 million (39.3%-49.5%)	World Bank, Fragile and Conflict-Affected Situations, FY2013	21.0% - 49.2%
Chen/World Bank (forthcoming)	174 million (38.7%)	2030 Optimistic: 82 million (15%) Pessimistic: 183 million (27.2%)	World Bank, Fragile and Conflict-Affected Situations, FY2014	38.1% - 40.1%
International Futures v7.04	200 million (43.7%)	2030 Base Case: 231 million (32.3%)	World Bank, Fragile and Conflict-Affected Situations, FY2014	37.3%

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[15] Chandy et al. and Edward/Sumner FCS poverty rates/headcounts (where missing) calculated using FCS population forecasts from IFs v7.0 (using aggregations made from the author-specified fragile state list)

Given a great range in the forecasts for global poverty, it is not surprising that those for fragile states also vary widely (see Figure 5 and Table 2). In fact, in light of differences across studies in definitions of fragile states, the 2030 poverty forecasts of these studies are not entirely comparable. Yet the overall trends of the forecasts are a useful reference point for our analysis. Except for Chandy et al., the base case forecasts for the authors mentioned above suggest the likelihood of increasingly large poor populations in fragile states over the next 15 or so years. The base case forecast for Chandy et al. decreases rapidly because of the inclusion of low-middle income countries like Nigeria and Bangladesh, both of which have large concentrations of populations sitting just below the poverty line in 2010 that are expected to cross that line in the next five to ten years.[16] The pessimistic forecast cases for Edward and Sumner are, in fact, by far the most pessimistic of the set. Even the trajectory of the optimistic national account-based scenario is more pessimistic than the estimate of IFs; while its 2010 starting value is below that of IFs, an extension of their forecast would suggest a comparable 2030 level to that of IFs. The World Bank forecasts for fragile states follow the same methodology used by Ravallion (2013); the "high" forecast uses extrapolated current trends in economic growth and inequality, and the "low" trajectory takes the growth and inequality projections from the simulation forecast in Ravallion (2013). Adjusting for initial starting points, the IFs forecast has a comparable pattern to that of the World Bank "high forecast". The Chandy scenario and the low World Bank scenarios are the most optimistic, but neither one brings fragile state poverty below 10 percent in 2030.

4. ALTERNATIVE SCENARIOS FOR POVERTY IN FRAGILE STATES: GROWTH AND SHARED PROSPERITY

4.1 RATIONALE

The international community has made a call for the eradication of extreme poverty by 2030 (the World Bank considers poverty eradicated if the global rate is below 3%), but, given the figures in the table above, fragile states would require unprecedented progress in just 15 years to completely eradicate poverty, making them the highest hanging fruit for this global goal. Before assessing the impacts of particular policy levers on poverty reduction, we explore the limits of realistic potential for poverty reduction in fragile states more generally.

As described above, the two main determinants in calculation of poverty reduction are increased growth and improved income distribution within a country. Economic growth is seen as the traditional aggregate driver of poverty reduction; the predominant logic is that, just as a rising tide lifts all boats, an increase in the total income of a country will lead to increasing incomes for the poor. While not all economic growth leads to poverty reduction, economic growth is held to be an important, if not the most important, contributing factor to poverty reduction. Where economic growth has not been associated with poverty rate reduction, it is because inequality has increased. More equal income distribution has been linked to poverty reduction by major international development organizations. World Bank President Jim Kim has stressed the importance of including "shared prosperity" in the post-2015 agenda[17], and the phrase "leave no one behind" has been an important part of the United Nations post-2015 agenda discussion.[18]

In our modeling, like that of the other projects discussed above, calculations of income-based poverty measures are a function of both income and distribution. It follows then that changes to economic growth or inequality will have a direct mathematical relationship with poverty. In that respect, the first set of scenarios presented below represent the range of what is possible, given the model's underlying assumptions about these two variables, rather than implications of policy. While policy makers can certainly adopt growth-promoting or inequality-reducing policies, the relationship between the policies and their effects are inherently more complex and we return to those in the next section. The first set of scenarios we present is an exploration of the potential poverty reduction that can be achieved given optimistic, but

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[16] Chandy et al. (2013).
[17] Jim Yong Kim (April 2013)
[18] United Nations (2013)

reasonable, economic growth or increases in equality. The final scenario in this set combines optimistic growth and inequality reduction to establish a possible lower bound for poverty reduction by 2030.[19]

4.2 METHOD

The optimistic economic growth scenario (referred to as "faster growth" scenario) explores the effects of above-average GDP growth for the fragile states. Following Edward and Sumner, our optimistic growth rates come from WEO, and we add two percentage points to country-level averages of WEO growth rates from the past fifteen years to create an optimistic growth rate for each country. These estimates are almost certainly overly optimistic, but should be read as reasonable upper bounds of what is possible, at least on average for fragile states as a set, rather than what is likely. Note that our growth rates fall in the "neighborhood" of those in Edward/Sumner and Ravallion as well as the progress made by fragile states in the recent past. A table containing the specific growth rates used for each country is included in the Technical Appendix.

Kuznets contended that economic prosperity first increases inequality in developing countries, and then inequality falls as countries reach "developed" economic status.[20] However, many countries have passed into and through middle income status without following that pattern. Moreover, on a global average, within-country inequality seems to be increasing independently of income level.[21] The approaches in the works described above each contain forecasts in which Gini is held constant, which further indicates the uncertainty surrounding expected future distribution patterns. The use of constant Gini in Ravallion's *optimistic* scenario demonstrates, however, the general acceptance of the baseline expectation that inequality will continue to increase in the developing countries. The slowly rising Gini forecast produced by the IFs Base Case is also in line with that expectation.

As there is uncertainty about trends in inequality, given the disconnect between global commitments and current trends, we create two scenarios with alternative assumptions about future inequality trends as compared to the assumption of a "slow increase" in our Base Case. The first scenario (referred to as "constant inequality") holds inequality, which is represented by the Gini coefficient, at constant 2010 levels for the entire forecast period. The second scenario (referred to as "lower inequality") builds in a trend of decreasing inequality among the fragile states, which follows the optimistic scenarios of Chandy et al. and Edward/Sumner. The rate at which Gini decreases in this scenario was determined by calculating the average of all instances in which Gini decreased between one year and the next in developing countries since 2000.[22] This average rate of decrease represents the observed potential in inequality reduction for developing nations.

4.3 RESULTS

The forecasts that follow in this section are highly optimistic results for poverty reduction, devoid as they are from the constraints of policy. Applying faster growth to each fragile country leads to a marked improvement in poverty rates versus the Base Case, but both holding inequality constant and reducing inequality have much less impact on poverty rates over our time horizon. However, there is potential for poverty reduction when higher growth and reduced inequality (shared prosperity) occur together.

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[19] The share of household consumption within the economy is, of course, another variable with direct impact on poverty. Discussed earlier with respect to IFs Base Case forecasts, the subsequent discussion of policy choices will return to it.

[20] Kuznets (1959)

[21] Todaro and Smith (2009)

[22] Based on the Gini coefficients from the WDI database; annual changes in Gini calculated for each developing country (using the World Bank definition) from 2000 to 2012, for a total of 371 observations; 215 of 371 observations were decreasing (less than zero), and an average was taken from those 215 observations.

Given the differences among fragile states in potential economic growth, the prospects for poverty reduction vary by country as well. For example, countries that are forecasted to have rapidly increasing economic growth in the next 15 years, especially post-conflict countries like Iraq and Libya, have less incremental poverty reduction when compared to the already expected declines of the Base Case forecast. The countries that benefited most from improved economic growth assumptions are countries that currently have stagnating GDP forecasts, like Madagascar and Micronesia, suggesting that a growth turnaround in these countries in the next few years could have dramatic effects on their poverty reduction. The optimistic growth forecast alone reduced poverty in Madagascar by nearly four million people. For the fragile states group, optimistic growth reduces the poverty rate in 2030 from 34% in the Base Case to 25.5%.

A similar pattern emerges in the constant and lower inequality scenarios. Although inequality rises in the Base Case for most countries, it does fall for some. For those in which it falls more rapidly in the Base Case than in either inequality scenario, the scenarios can actually generate a slight increase in poverty. However, an increase occurs for only three of the 33 countries for the constant inequality scenario and one country in the lower inequality scenario.

Reducing inequality does not have a powerful poverty-reducing effect in fragile states when it occurs in isolation. The constant inequality scenario reduces the poverty rate of 2030 in fragile states from 34% to 32%, and the lower inequality scenario reduces the poverty rate to 26.6%. The largest poverty reduction from the decreasing inequality scenario occurs in the Democratic Republic of Congo. Due to population growth, the poverty headcount in the D.R.C. still rises from 2010 to 2030 in the decreasing inequality scenario, but the poverty rate falls from 86% in 2010 to 65% by 2030, versus 67% in the Base Case.

Last, we combine both optimistic scenarios—high growth and decreasing inequality—to yield a lower bound estimate of poverty reduction in fragile states. This combined scenario (dubbed the "GSP" scenario for "growth and shared prosperity") represents a concerted and successful effort by the global community (national leaders, the private sector, the

Figure 6A: Poverty Rate, Growth and Shared Prosperity
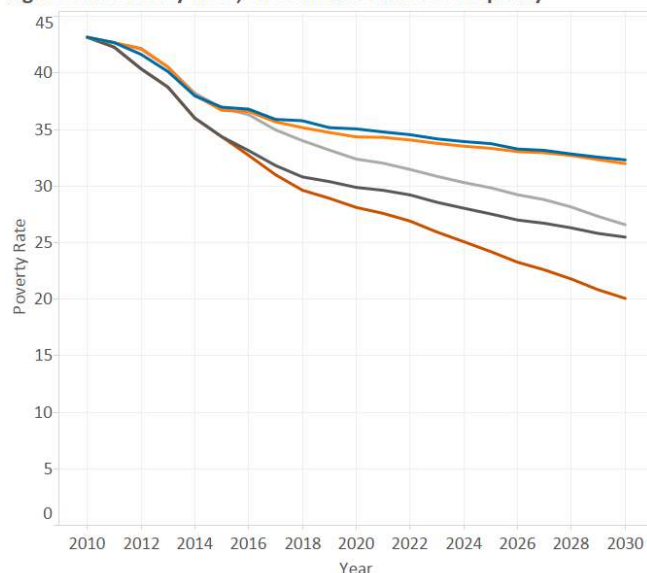
Source: International Futures v7.04

Scenario
- Base Case
- Constant Inequality
- Lower Inequality
- Faster Growth
- Growth and Shared Prosperity

Figure 6B: Poverty Headcount, Growth and Shared Prosperity
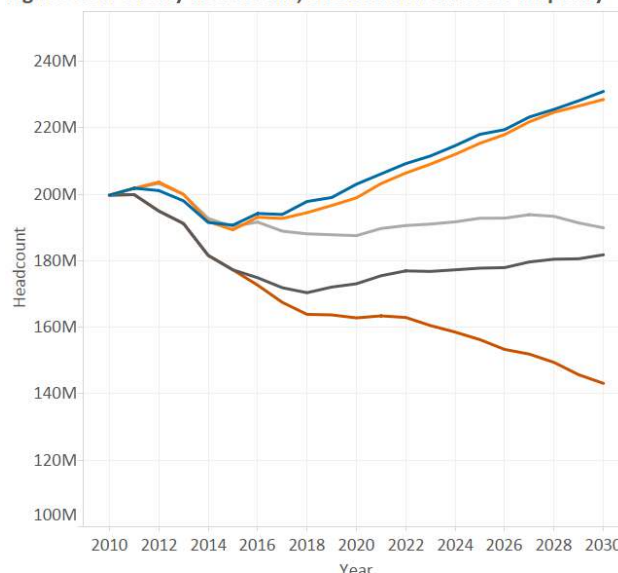
Source: International Futures v7.04

Scenario
- Base Case
- Constant Inequality
- Lower Inequality
- Faster Growth
- Growth and Shared Prosperity

international community) to promote the goals of growth and shared prosperity in fragile states. The resulting 2030 poverty rate, which is 20.1% in 2030, shows that faster growth and lower inequality are more effective together in reducing

poverty than any of the single-intervention scenarios alone.[23] Unfortunately, even in the GSP scenario, fragile states do not manage to eradicate poverty. This should be interpreted as the limit of poverty reduction possible in FCS given current approaches and trends and can inform reasonable target setting for this group of countries.

If not 3%, what is a reasonable poverty goal for fragile states? Our GSP scenario produces a poverty rate around 20% in 2030, but this poverty rate is achieved with very optimistic assumptions for GDP growth rates and shared prosperity captured by the Gini coefficient. While the international development community agrees that growth and shared prosperity are essential in poverty eradication, policymakers obviously cannot directly change economic growth or inequality and must instead adopt policies that promote growth or reduce inequality. We next turn to the impacts on poverty reduction for FCS of more policy-oriented approaches.

5. TARGET POINTS FOR ACTION IN FRAGILE STATES: INSTITUTIONS, CONFLICT, AND POLICIES

5.1 RATIONALE

Growth and shared prosperity are integral parts of poverty eradication—on this point, the literature, historical trends, and our scenario analyses agree. But how do policymakers promote growth and shared prosperity in fragile states? What is keeping fragile states from improving growth and attaining more equitable distributions of income and consumption? To answer these questions, we turn our analysis first to two core elements of fragility—weak institutions and the presence of conflict.

Both weak institutions and the presence of conflict inhibit economic growth and, in some cases, exacerbate inequality. For example, weak institutions contribute to poor health and education, decreased government transparency, increased government corruption, poor infrastructure, and inefficient economic management, fiscal policy, and business regulation (North 1990; Tanzi and Davoodi; 2002; Rodrik 2007; Fukuyama 2011; Acemoglu and Robinson 2012). The presence of conflict also has extensive detrimental effects on the development of a society. According to a review of earlier analyses by the 2011 WDR,"... a major episode of violence ... can wipe out an entire generation of economic progress."[24] Our second set of optimistic scenarios represents the possible gains that can be made if these two issue areas are directly addressed as a part of the post-2015 agenda. The improvements used in our optimistic scenarios are based around historically-observed rapid improvements in institutional strength and reductions of conflict in fragile states following the methodology developed by Pritchett and de Weijer (2010). This set of optimistic scenarios models improved institutional capacity and a concerted move by domestic actors and the international community to reduce conflict in fragile states.

5.2 METHOD

To identify realistic prospects for improving institutions and reducing conflict, we first quantify the current level of institutional capacity and conflict in each fragile state. A good choice for quantifying institutional performance would have been the Country Performance and Institutional Analysis (CPIA) score, which is used as the primary criteria for the Fragile and Conflict-Affected Situations (FCS) list. The CPIA score is the average of four indices, or "clusters": 1) Economic management, 2) structural policies, 3) policies for inclusion and equity, and 4) public sector management. However, historical CPIA scores have not been incorporated into the IFs model and are not publicly available before 2005. Instead, to understand patterns of change over time we turn to several governance indices that are forecast within the IFs model and

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[23] This value is, of course, still above the 2030 values of the World Bank's low scenario and that of Chandy for their somewhat different sets of fragile states with associated lower starting points in 2010. Among the reasons are the dynamics around household consumption share of the IFs economic and financial forecasts that we discussed earlier.

[24] For an extensive discussion of the effects of conflict on development, see pp. 5-6 of the 2011 WDR including this summary quote on page 6.

that share some of the same elements contained within the four CPIA clusters, including the level of democratization, gender empowerment, government administrative capacity, and government corruption. The IFs capacity index combines the ability of governments to mobilize revenues as a portion of GDP with the level of corruption reduction. The IFs inclusion index combines democratization with gender empowerment. We use a simple average of the IFs capacity and inclusion indices to represent institutions, and for convenience, we label the resulting value the "institution index". In the FCS list, conflict is represented by the presence of either a UN political mission or peacekeeping mission within the country. For our analysis, we use the IFs security index, which combines an estimate of the probability of intrastate conflict with a sub-index representing overall governance performance and the risk. Both the IFs institution and security indices are based on historical data and we calculate them in the model for each fragile state and can adjust their component values for our scenarios.

Our two optimistic scenarios for institutions and security (referred to as "improved institutions" and "improved security" scenarios) are framed around standard deviation improvements in the IFs institutions index and the IFs security index. A standard deviation is calculated from the IFs institution index for all fragile states in 2010, and the same process is repeated for the IFs security index.

To determine whether our scenario interventions are reasonable, we check our magnitudes of improvement against the thresholds for good governance developed in Pritchett and de Weijer (2010). While Pritchett and de Weijer do not use any indicators directly comparable with the IFs security index, their threshold values for governance lie slightly above the world average. An increase of one standard deviation in the average value of fragile states on the IFs institution index would put that grouping slightly above the world average, supporting our choices with respect to the scale of the improvements.

We next calibrate the rate of improvement in our scenarios against an optimistic scenario methodology. Pritchett and de Weijer (2010) investigate the gains that have been made by developing countries in improving institutions from 1985 to 2009, in terms of bureaucratic quality, corruption, and the role of the military in politics. Those authors then compare the length of time it would take fragile countries to reach a qualitatively designated "good enough" level of governance if they were to improve at 1) their current rate, 2) the average rate of all developing countries, 3) the rate of the fastest 20 countries, and 4) the rate of the top performer. The "fastest 20" rate of improvement is used as the optimistic scenario, and the authors conclude that, at this rate, the average fragile state can achieve a threshold ("good enough") level of bureaucratic quality in around 24 years. Given that our time horizon is a little less than two-thirds the horizon used in Pritchett et al., a comparable rate of improvement in the IFs indices would produce roughly 60% of a full standard deviation improvement by 2030. Thus our pursuit of a full standard deviation improvement by 2030 is quite an aggressive scenario for reduction in fragility.

Our scenarios assume that improvements in government revenues, gender empowerment, democracy (as measured by the Polity autocracy-democracy index scores) and reductions in government corruption begin in 2015 and ramp up steadily through 2030. Our interventions are not equally weighted; most gains in the aggregate institution index were purposefully made through the decrease of government corruption and increase of polity levels, based on the assumption that corruption and lack of political freedom are greater short-term impediments to state capacity-building in fragile states than revenue collection or gender empowerment.[25] Similarly, the interventions made with respect to the two underlying variables of the IFs security index (intrastate violence and government risk) were not equally weighted in our pursuit of a standard deviation improvement in security. Instead we fully eliminated intra-state conflict and then further reduced government performance risk to achieve the desired overall improvement in the security index for the fragile state grouping.

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[25] The relative weights of the different interventions are based on preliminary scenario analysis; with this in mind, the configuration of the IIS scenario could be disaggregated and its individual effects studied further in subsequent work.
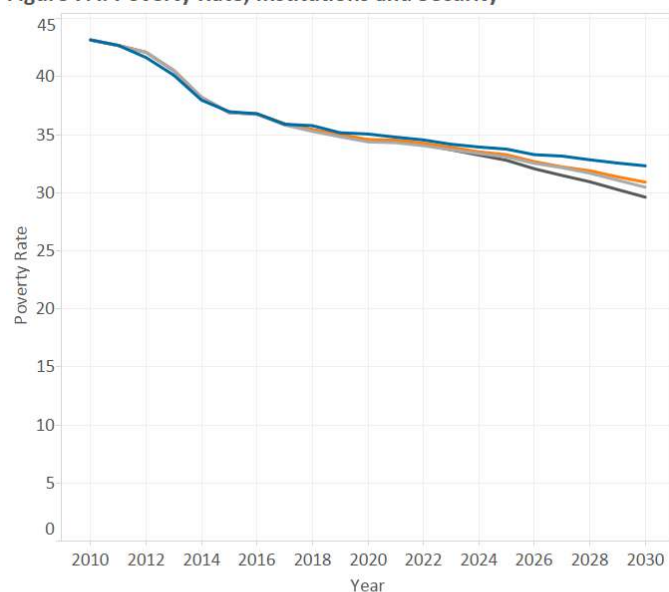
Following the method used in the set of scenarios around shared prosperity, we also combine the improved institutions and improved security scenarios to frame a most optimistic case for fragile states (referred to as "improved institutions and security" or "IIS"). This combined scenario represents a highly ambitious and concerted effort by all fragile states and their partners in the international development community to increase institutional capacity and eliminate conflict in fragile states as a part of the post-2015 agenda.

5.3 RESULTS

As a result of the improved institution scenario, the institution index moves from 0.402 in 2010 to 0.54 in 2030 for the fragile state group, this puts it just under the 2010 world average of 0.569.[26] In the improved security scenario, the security index doubles on average in fragile states from 2010 to 2030, which brings the security index above the world average in 2010.

Overall, the reduction in poverty is very small when compared to the 2030 poverty figures in the IFs Base Case (see Figures 7A and 7B). For the entire fragile states group, poverty is forecasted to fall from 43% to 32% from 2010 to 2030 in the Base Case. The improved security scenario brings the FCS 2030 figure down to 30.5%, while the improved institutions scenario results in a poverty rate of 30.9% for FCS in 2030. A combined scenario that includes the interventions made in the improved institutions and improved security scenarios brings the poverty rate in 2030 for the fragile states to 29.6%, which is still only a 2 percentage point improvement over the IFs Base Case.

Figure 7A: Poverty Rate, Institutions and Security   Figure 7B: Poverty Headcount, Institutions and Security
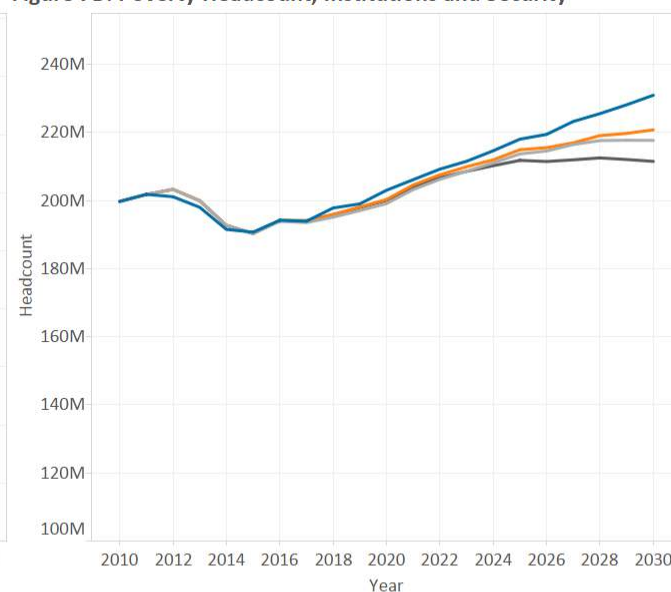
Source: International Futures v7.04   Source: International Futures v7.04

Scenario
- Base Case
- Better Security
- Better Institutions
- Improved Institutions and Security

Scenario
- Base Case
- Better Security
- Better Institutions
- Improved Institutions and Security

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[26] The analysis is based on data up to 2011; therefore recent developments, such as the outbreak of violence in Mali, South Sudan, and Central African Republic are not reflected in the IFs data. In addition, most of the effects caused by Arab Spring events are not reflected in 2011 data, and are therefore not reflected in the IFs model.

5.4 IMPROVED INSTITUTIONS AND SECURITY EXTENDED (IISE)

Poverty reduction in the IIS scenarios discussed above is disappointing, but it does not tell the full story. Although institutions and security are improved in the scenarios, the model does not automatically link these improvements to a full set of policy consequences. For example, increased institutional strength conceptually leads to changes in government policy concerning issues as disparate as family planning and demographics, human development, economic orientation, and environmental sustainability, but greater institutional strength does not "turn on" better policies in the IFs model, as *perhaps* they would, and we hope that they would, in reality. Therefore, the breadth of improvements within an actual society resulting from reduction of fragility would very likely be much greater than the improvements represented by the improved institutions and security scenarios. The next scenario in our analysis therefore includes the interventions from the improved institutions and security scenarios as well as policy-related changes that would most likely result from those scenarios. The policy-related interventions are based on work done in the *Patterns of Potential Human Progress* (PPHP) series by the Pardee Center for International Futures. Each volume covers a specific issue area (poverty, education, health, infrastructure, and governance), and each volume contains scenario analyses that frame the potential gains and potential challenges for the issue in question. In Hughes (2013), optimistic scenarios from the five volumes are combined into an improved policy and policy orientation scenario, which represents "aggressive, but reasonable" improvements across all five issue areas of the PPHP series. Box 1 gives a short description of the six different clusters of interventions added into this scenario, which we can call Improved Institutions and Security Extended (IISE).

The result of the IISE scenario is promising, and the resulting poverty rate is much closer to the limit poverty rate obtained from the growth and shared prosperity scenario. By 2030, the poverty rate falls from 43% to 24.3%, compared to 32% in the Base Case and 20.1% in the growth and shared prosperity scenario (see Figures 8A and 8B). However, the path of poverty reduction in the IISE slows

Box 1: Categories of Interventions in the Improved Institutions and Security Extended (IISE) Scenario
Most of the scenario interventions used in the IISE scenario come from previous scenario work in Hughes et al. (2014 forthcoming) and Hughes (2013). These interventions represent likely policy changes that would occur as a result of improved institutions and security.

Human Capital
Investment in human capital is a very large component of this scenario, and most investment is funneled into the education system and health care. For education, the intake rate, survival rate, and gender parity are improved. Improved health comes in the form of decreased deaths from communicable diseases (AIDS, malaria, respiratory infections, etc.) and decreased incidence of undernourishment in children. Attention to family planning reduces fertility.

Environment
Quality of life is also improved in this scenario through the decrease of solid fuel use indoors, which is a proxy for increased ability of the government to provide natural gas and electricity for households. Urban air pollution is also reduced to represent increased regulatory capacity of the government and the positive environmental effects that would result from better regulation.

Infrastructure
An increase in government capacity improves access to safe water and improved sanitation. These improvements further enhance health outcomes. The scenario also includes improvements in access to electricity and telecommunications through increased access to mobile services and broadband.

Policy Shifts
The IISE scenario includes a set of policy orientation shifts that are likely if a country had improved institutions; therefore, it is assumed that the governance foundation is strong enough to both enforce and benefit from these policy shifts. The shifts include greater economic freedom, the promotion of exports, greater trade openness, improved agricultural yields, and increased government spending in research and development.

International Support
Finally, the scenario also includes interventions that represent a concerted effort from the international community to inject productive capital into fragile states through greater inflows of foreign direct investment and aid. Access to an increased amount of credit from the IMF and the World Bank is also included.

**Intervention Magnitudes**
In each case the magnitude of intervention was scaled so as to be "aggressive, but reasonable", as developed in the Patterns of Potential Human Progress volume series and elaborated in the sources specified. The two most common approaches to scaling involved historical analysis of good performers and the use of standard error analysis of functions against income levels.

down somewhat from 2015 to 2020 even when compared to the Base Case.

The slowdown in the rate of poverty reduction relative to the Base Case in the early years is due to short-term tradeoffs within the IISE scenario that yield longer term benefits. Because increased government spending on human capital and increased savings/investment are major features of the IISE scenario, this expenditure can displace some household consumption in the short term (with appropriate shaping of policies, for instance the use of conditional cash transfers, that displacement could be minimized or even reversed). Poverty headcounts are calculated directly from household consumption, so a decrease in household consumption has an immediate additive effect on poverty figures. In contrast, some investments including those in education and health, take considerable time before pay-offs appear. The long term benefit begins to materialize after 2020, and the rate of poverty reduction takes a sharp, downward turn relative to the Base Case.

Figure 8A: Poverty Rate, Alternative Scenarios
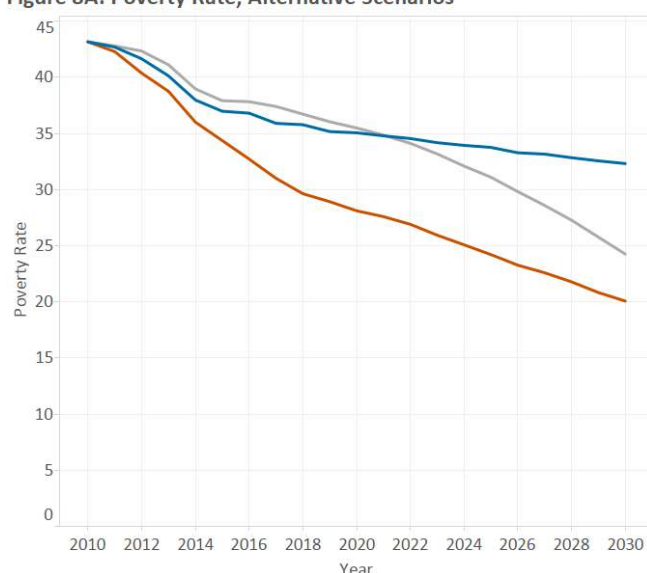
Source: International Futures v7.04

Scenario
- Base Case
- Growth and Shared Prosperity
- Improved Institutions and Security Extended

Figure 8B: Poverty Headcount, Alternative Scenarios
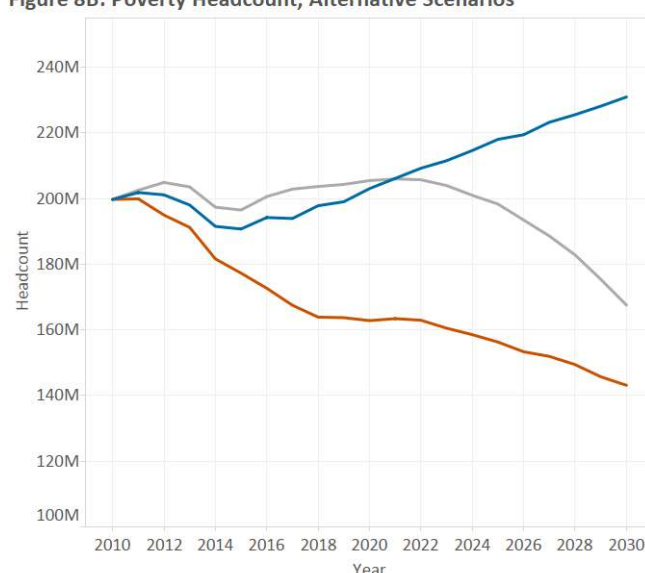
Source: International Futures v7.04

Scenario
- Base Case
- Growth and Shared Prosperity
- Improved Institutions and Security Extended

Table 3: Countries with the Largest Reductions in Poverty Headcount in 2030 as a Result of the IISE Interventions

Poverty headcount reductions, IISE vs. Base Case, 2030				
Dem. Rep. of Congo	Madagascar	Chad	Afghanistan	Malawi
27.91 million	5.68 million	5.1 million	3.23 million	3.18 million
Changes in poverty rates, IISE vs. Base Case, 2030				
-25 % pts.	12.6 % pts.	-23.2 % pts.	-6.8 % pts.	-9.6% pts.

The greatest reductions in the poverty headcount (see Table 3) as a result of the IISE scenario are in Myanmar, the Democratic Republic of Congo, Afghanistan, Sierra Leone, and Côte d'Ivoire. These countries come out on top for two possible reasons—first, these countries have a large number of poor in the Base Case, and therefore have great potential for reduction from 2010 to 2030; second, the security-improving interventions have a dramatic effect in countries that have ongoing conflicts, like Myanmar and Afghanistan.

When turning from headcount to poverty rate, again the Democratic Republic of Congo has the largest reduction compared to our Base Case 2030 forecasts, followed by Chad, Liberia, Afghanistan, and Madagascar. The poverty rate in

the D.R.C. drops from nearly 86% to 42% in the IISE scenario, which is 25 percentage points lower than the Base Case 2030 poverty rate of 67%. The poverty rate is lowered from the Base Case value for 2030 of 42% to 18% in 2030 in Chad, from 58% to 43% in Liberia, from 12% to 5% in Afghanistan, and from 90% to 77% in Madagascar. While none of these poverty rates come near the 3% goal of the international community, the number of people lifted out of poverty remains extremely significant. Additionally, the Base Case forecast predicts an overall rise in the poverty headcount in fragile states by 31 million from 2010 to 2030 (even as the rate declines by 10 percent), but, as a result of the IISE scenario, the poverty headcount drops by 32 million.

The IISE scenario also helps identify the effects of poverty reduction in the overall well-being of people in fragile states. The forward linkages included in this scenario have a positive effect on health and social welfare, not just incomes. Some other notable improvements from this scenario include a lower total fertility rate, increased average years of education, and fewer deaths from communicable diseases. Life expectancy changes dramatically for a few fragile states that are disproportionately affected by communicable disease burdens (see Figure 9). In short, while this scenario still does not eliminate poverty by 2030, it lays a much stronger foundation for doing so in the years beyond.

Figure 9: Improvements in Life Expectancy
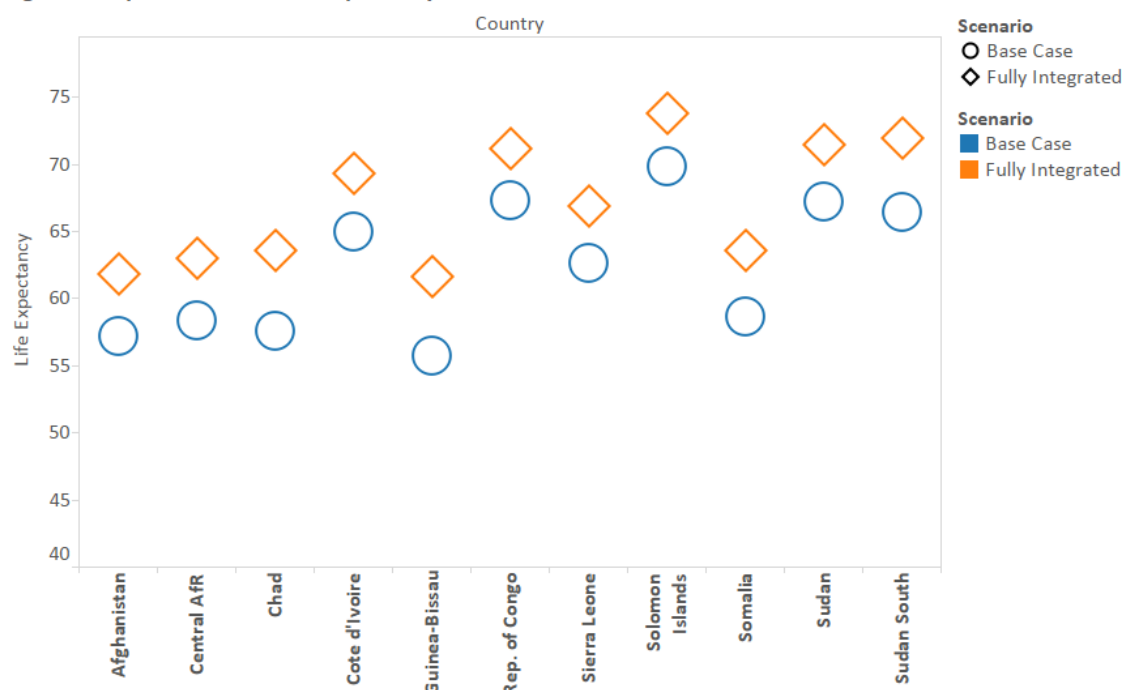
Source: International Futures v7.04

6. CONCLUDING REMARKS

6.1 REMARKS ON THE 3% POVERTY TARGET

Our most optimistic poverty rate is 20.1% in 2030 for FCS. This is a long way from the global goal of 3%, particularly when good progress is a decrease of 1 to 2 percentage points per year. This does not necessarily mean that a poverty rate at or below 3% for some or all fragile states is not achievable. In fact, in our Shared Prosperity scenario Afghanistan and Myanmar reach that level. Yet as the difference between the projected poverty rate for the FCS group as a whole and the 3% target suggests, most of the countries in the fragile country grouping, or at least enclaves of the poor within them, are at great risk of being "left behind" with respect to the eradication target.

Our analysis of the prospects for fragile states also has important implications for the goal with respect to the global poverty goal. As a result of the lagging of poverty reduction in FCS, the rest of the world would need to reach a 0.2% poverty rate (20.7 million people) to bring the global poverty rate below 3% by 2030. However, even with a 20% poverty rate in fragile states, it would not be possible to bring the poverty rate of the developing world to 3% by 2030.

As this paper went to press, the International Comparison Project released newly revised Purchasing Power Parity values, rebased to 2011. Our early analysis of these new numbers suggest the need for adjustments to our base year values of poverty in fragile states that will collectively reduce the estimate of $1.25 poverty rate downward in 2010 from 44% to 34%. Similarly preliminary re-analysis of our scenarios with the new values suggests the likelihood of ultimate downward revisions of our 2030 forecasts of fragile state poverty rates by 5-6% across all scenarios. Although such adjustments are quite significant, they still leave even our most optimistic forecasts well above the 3% threshold for poverty eradication.

6.2 AREAS OF ADDITIONAL RESEARCH

Our analysis has focused on improvement potential with respect to poverty reduction in fragile states. It has not given attention to the downside risks. Those are many, of course, including the possibility that other states could fall into the fragile set for reasons such as deterioration in leadership quality and conflict that spills across borders. Nor does our analysis include any attention to change in climate and effects that would have. Fragile states are particularly vulnerable to disasters (Keefer et al., 2011) and many of the countries that will be most affected by climate change are currently fragile (Shepherd et al., 2013). The effects of climate change add an additional obstacle to poverty reduction in fragile states, and, like inequality, the global discourse increasingly includes climate change as an issue to be addressed in the post-2015 agenda. Our work would be enhanced by an analysis on the degree to which countries, especially fragile states, may be affected in coming years by climate change and the resultant effects on poverty reduction.

Chronic poverty, as opposed to more episodic incidence, is another issue that has increasing salience in poverty reduction research and its incorporation into our analysis would be beneficial. However, the concept of chronic poverty is not easily modeled; it is not yet conceptually well-defined, and it is often based on household-level data rather than country-level data.

6.3 SUMMARY OF POVERTY REDUCTION POSSIBILITIES IN FRAGILE STATES

Based on current trends and past performance (the Base Case) the poverty rate for fragile states is expected to fall from 43% in 2010 to 32% in 2030. However, due to population growth in these countries, the absolute number of people living under $1.25 a day is expected to rise from 200 million in 2010 to 231 million in 2030. Because this is concurrent with overall progress in poverty reduction in other developing countries, the percentage of the developing world's poor in FCS is projected to increase from 16% in 2010 to 37% in 2030.   Under an ambitious scenario with improved institutions and peace in fragile states, the poverty rate in FCS decreases by two percentage points from 2010 to 2030, which brings the number of poor down by nearly 12 million in 2030 versus the Base Case. However, we note that political reforms and peace are necessary but insufficient on their own to eradicate poverty. When effective poverty reduction policies are added to these peace and good governance effects (under the IISE scenario), the poverty rate is reduced to 24% in 2030, and the poverty headcount falls to 168 million by 2030. We believe this scenario to be at least potentially achievable.

In the most optimistic of our scenarios, we explore what would happen if fragile countries experienced very high rates of growth with shared prosperity. We developed this scenario to consider what might be something closer to a true limit on poverty reduction potential. The result for fragile states in this highly optimistic scenario, framed by macro level assumptions rather than policy level assumptions, is a poverty rate of 20.1% and a poverty headcount of 143 million in 2030.

Figures 10A and 10B show the variation within the fragile state set, both in rates and numerical levels of poverty and in their prospects for responsiveness to our alternative scenarios. Focusing only on the ten countries with the greatest number of poor, we can see that the potential for accelerated reduction in our analysis ranges from cases in which the acceleration could cut numbers by 2030 in more than half relative to the base case to other cases in which progress is already likely to be sufficiently rapid, or problems such as intensity of poverty are so great that the scenarios have marginal impact.
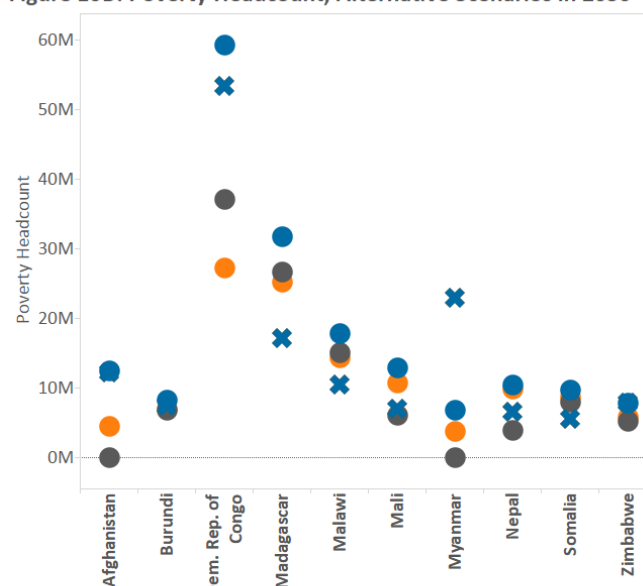
Figure 10A: Poverty Rate, Alternative Scenarios in 2030

Figure 10B: Poverty Headcount, Alternative Scenarios in 2030

Poverty rates in 2030 for the Base Case and Fully Integrated scenarios. Initial (2010) poverty rate shown as an "X". Countries with ten highest headcounts shown. Source: International Futures v7.0

Year	Scenario
✖ 2010	■ Base Case
● 2030	■ Growth and Shared Prosperity
	■ Improved Institutions and Security Extended

Poverty rates in 2030 for the Base Case and Fully Integrated scenarios. Initial (2010) poverty rate shown as an "X". Countries with ten highest headcounts shown. Source: International Futures v7.0

Year	Scenario
✖ 2010	■ Base Case
● 2030	■ Growth and Shared Prosperity
	■ Improved Institutions and Security Extended

All countries, fragile or not, can benefit from improved institutions. These results demonstrate that even within the subset of fragile countries, the impact of improved institutions has varying effects. Many countries (including Burundi, Chad, DRC, Myanmar, Sierra Leone, West Bank and Gaza and Zimbabwe) could attain more than half of their maximum expected poverty reduction through effective institutional reforms. For other countries less than half of their poverty reduction would come from institutional reform because the growth effects are strong (Liberia is an example). Still other countries (Comoros, Haiti, Madagascar, Somalia, and Yemen) are not expected to make any significant progress under any of the scenarios considered here and have little prospect for meeting any targets.

6.4 CONCLUDING REMARKS

Eradicating poverty by 2030 is a truly ambitious goal, and serious, sustained improvements in both economic growth and inequality will be needed throughout the developing world to achieve it. But, as we can conclude from our study of poverty reduction in fragile states, the eradication of extreme poverty in fragile states in the next 16 years is, unfortunately, highly improbable, given current conditions and global trends (upon which our model is based). Also, the analysis suggests that even with policies that address the primary elements of fragility (weak institutions and the presence

of conflict) and comprehensive policies focused on poverty reduction, fragile states as a group are still unlikely to halve their poverty rates by 2030—although they would come close to doing so over a period of just 20 years, short of the 25-year horizon for cutting poverty by half in the original 2015 MDGs. With peace and a focused reform agenda, fragile states have the potential to lift more than 30 million people out of poverty by 2030.

Still if the global goal is to eradicate extreme poverty and "pick all the fruit" whether low-hanging or high-hanging, the world will need to start somewhere and the post-2015 goal setting is a means to focus global effort on this noble goal. The analysis shows how both growth *and* shared prosperity contribute to poverty reduction and further underlines the role of institutional reform in delivering the effects of growth and shared prosperity.

We close on an optimistic note by reminding the reader that our analysis is based on a model built on past performance. The next round of poverty reduction post-2015 could outperform our scenarios with innovative approaches, new technologies, more efficient aid, more inclusive growth, and an increased focus on the countries that are most likely to lag, identified above. To be effective, such bold new steps will need to be undertaken early if the compounded effects of development are to bear fruits before 2030. If the global community stays the current course or waits too long to handle the tough cases in fragile states, we will not only miss our goal, but we will once again find these countries lagging in development in the next round of global goal setting.

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TECHNICAL APPENDIX

1. POVERTY FORECASTING IN THE INTERNATIONAL FUTURES (IFS) MODEL

The immediate determinants of poverty rates in the IFs forecasting system are household consumption per capita and income distribution as represented by the Gini coefficient. The IFs economic submodel has a general-equilibrium structure, embedded in a social accounting matrix, for goods and services markets and financial flows among agent classes (although its representation of the labor market is not fully developed). The equilibration within IFs is recursive over time and the system seeks equilibrium rather than imposing it each year. The production function of the model uses a version of the Cobb-Douglas production function driven by capital, labor, and an endogenous representation of multi-factor productivity that allows economic growth to respond to changes in human capital (including education and health), social capital (including governance), physical capital (including infrastructure) and knowledge capital. The social accounting matrix and financial flow structures calculate changing final demand that in turn gives rise to patterns of household income and consumption that vary over time as a percentage of total GDP.

The income distribution within IFs is calculated from the shares of income accruing to skilled and unskilled households, the relative share of which in population is initialized with data from the Global Trade and Analysis Project but vary over time with educational attainment. The model assumes log-normal distribution of income within societies and that assumption, along with the Gini index and the household consumption per capita, can fully specify poverty rates. As indicated above, however, large numbers of deeper drivers determine both household consumption and Gini, providing the basis for the extended scenario analysis of this report.

Given poverty rates, calculation of poverty headcount only requires population size. IFs includes a full cohort-component population model with endogenized fertility and mortality rates, the latter driven by a full health model.
Figure 11 provides an overview of the full set of modules or submodules that constitute the IFs forecasting system. Those represent each of 186 countries and key movements among them. The system includes a user interface that facilitates user change, including variations over time, of all parameters and comparison of resultant scenarios. It also hosts an extensive database of more than 2500 series, including those associated with poverty analysis. The system is available for use on-line or download at Pardee.du.edu, as is much more extensive documentation.

Figure 11
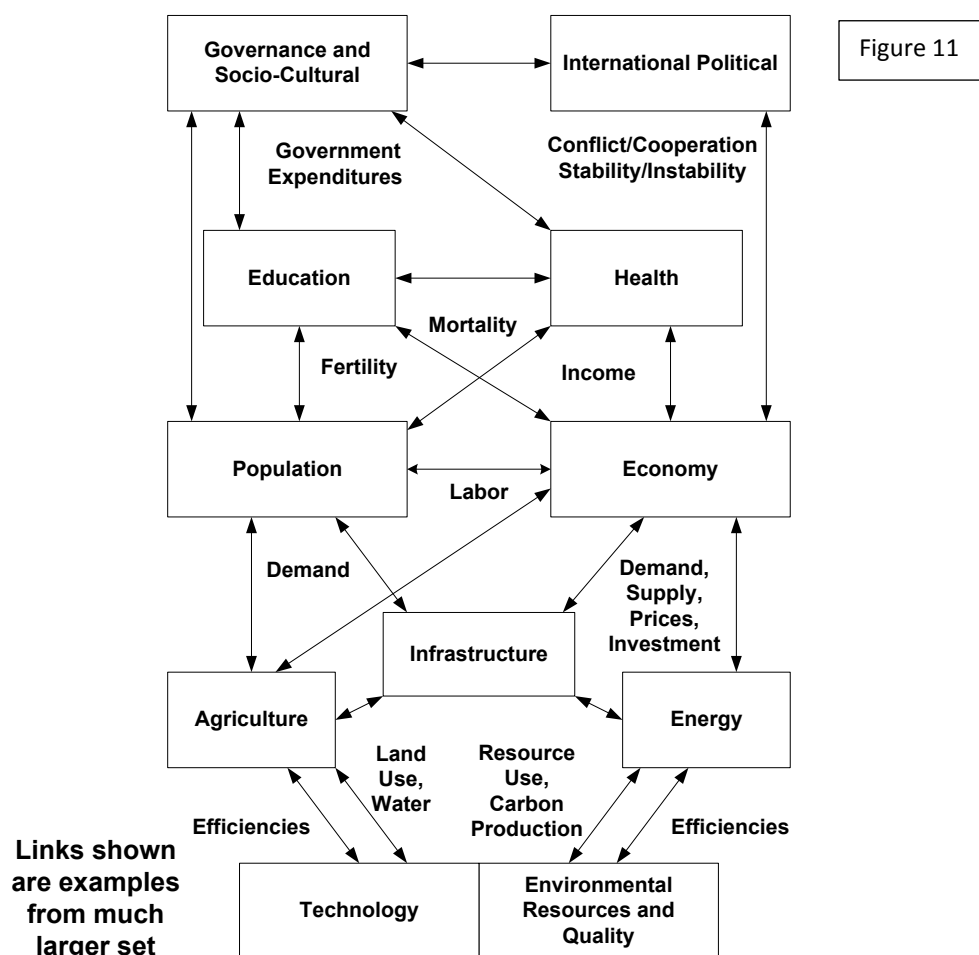
2. HISTORICAL FRAGILE AND CONFLICT-AFFECTED STATES LISTS

Fragile Situations	Fragile Situations	Fragile Situations	Fragile Situations	Fragile Situations
2010	**2011**	**2012**	**2013**	**2014**
Afghanistan	Afghanistan	Afghanistan	Afghanistan	Afghanistan
Angola	Angola	Angola	Angola	
Bosnia & Herzegovina	Bosnia & Herzegovina	Bosnia & Herzegovina	Bosnia & Herzegovina	Bosnia & Herzegovina
Burundi	Burundi	Burundi	Burundi	Burundi
Cameroon				
Central African Republic	Central African Republic	Central African Republic	Central African Republic	Central African Republic
Chad	Chad	Chad	Chad	Chad
Comoros	Comoros	Comoros	Comoros	Comoros
Congo, Dem. Rep.	Congo, Dem. Rep.	Congo, Dem. Rep.	Congo, Dem. Rep.	Congo, Dem. Rep.
Congo, Rep	Congo, Rep	Congo, Rep	Congo, Rep	Congo, Rep
Cote d'Ivoire	Cote d'Ivoire	Cote d'Ivoire	Cote d'Ivoire	Cote d'Ivoire
Djibouti				

Eritrea	Eritrea	Eritrea	Eritrea	Eritrea
Gambia, The				
Georgia	Georgia	Georgia		
Guinea	Guinea	Guinea	Guinea	
Guinea-Bissau	Guinea-Bissau	Guinea-Bissau	Guinea-Bissau	Guinea-Bissau
Haiti	Haiti	Haiti	Haiti	Haiti
	Iraq	Iraq	Iraq	Iraq
Kiribati	Kiribati	Kiribati	Kiribati	Kiribati
Kosovo	Kosovo	Kosovo	Kosovo	Kosovo
Liberia	Liberia	Liberia	Liberia	Liberia
			Libya	Libya
				Madagascar
				Malawi
				Mali
		Marshall Islands	Marshall Islands	Marshall Islands
		Micronesia, FS	Micronesia, FS	Micronesia, FS
Myanmar	Myanmar	Myanmar	Myanmar	Myanmar
Nepal	Nepal	Nepal	Nepal	Nepal
Papua New Guinea				
Sao Tome and Principe	Sao Tome and Principe			
Sierra Leone	Sierra Leone	Sierra Leone	Sierra Leone	Sierra Leone
Solomon Islands	Solomon Islands	Solomon Islands	Solomon Islands	Solomon Islands
Somalia	Somalia	Somalia	Somalia	Somalia
			South Sudan	South Sudan
Sudan	Sudan	Sudan	Sudan	Sudan
			Syria	Syria
Tajikistan	Tajikistan			
Timor-Leste	Timor-Leste	Timor-Leste	Timor-Leste	Timor-Leste
Togo	Togo	Togo	Togo	Togo
			Tuvalu	Tuvalu
Tonga				
West Bank & Gaza	West Bank & Gaza	West Bank & Gaza	West Bank & Gaza	West Bank & Gaza
Western Sahara	Western Sahara	Western Sahara		
Yemen	Yemen	Yemen	Yemen	Yemen
Zimbabwe	Zimbabwe	Zimbabwe	Zimbabwe	Zimbabwe

3. COMPARISON OF ECONOMIC GROWTH RATES: IFS, WDI, AND WEO

Country	IFs Base Case, 2010	WDI, 2010	WEO, 2010	IFs Base Case, 2011	WDI, 2011	WEO, 2011	IFs Base Case, 2012	WDI, 2012	WEO, 2012
Afghanistan	5.00	8.43	8.43	7.07	6.96	6.11	10.23		12.47
Bosnia	5.50	0.70	0.72	1.00	1.30	1.26	-1.08	-0.70	-0.70
Burundi	2.66	3.79	3.79	4.22	4.19	4.19	4.03	4.00	4.02
Central African Republic	2.77	3.30	3.05	3.11	3.10	3.30	4.14	4.10	4.11
Chad	6.90	13.00	13.55	1.46	1.60	0.08	5.03	5.02	8.88
Comoros	3.51	2.05	2.05	2.21	2.23	2.23	2.96	2.96	2.96
Congo, Democratic Republic of	4.32	7.17	7.17	6.99	6.88	6.88	7.28	7.15	7.15
Congo, Republic of	4.60	8.75	8.75	3.32	3.42	3.42	3.76	3.80	3.83
Cote d'Ivoire	3.28	2.39	2.45	-4.97	-4.73	-4.73	8.12	9.50	9.76
Eritrea	4.00	2.19	2.19	8.87	8.68	8.68	7.14	7.02	7.02
Guinea-Bissau	2.66	1.72	3.47	5.78	5.70	5.34	-1.62	-1.50	-1.45
Haiti	2.48	-5.42	-5.42	5.67	5.59	5.59	2.82	2.82	2.82
Iraq	6.47	5.86	5.86	8.51	8.58	8.58	8.30	8.43	8.43
Kosovo	3.33	3.90	3.21	5.03	5.00	5.19	3.81	3.80	2.35
Liberia	5.50	10.94	6.12	9.67	9.45	7.89	10.35	10.82	8.31
Libya	3.72		5.02	-0.98		-62.08	4.67		104.48
Madagascar	3.75	0.53	0.42	1.81	1.87	1.81	3.08	3.10	1.90
Malawi	4.88	6.53	6.53	4.35	4.35	4.35	1.78	1.89	1.89
Mali	4.70	5.82	5.82	2.68	2.73	2.73	-1.40	-1.19	-1.19
Micronesia, Fed. Sts.	2.66	2.53	2.53	2.02	2.05	2.05	1.35	1.40	0.43
Myanmar	5.91		5.35	5.56		5.91	6.39		6.36
Nepal	4.09	4.82	4.82	3.91	3.88	3.42	4.68	4.63	4.85
Sierra Leone	6.71	5.44	5.35	6.04	6.03	5.98	11.06	15.22	15.16
Solomon Islands	3.55	7.00	7.83	8.39	9.00	10.72	3.92	3.90	4.80
Somalia	5.50			-0.31			-0.28		
Sudan	3.69	3.48	2.53	-3.38	-3.29	-1.81	-10.32	-10.10	-3.27
Sudan South	2.71	4.22		1.35	1.93		3.04	-55.81	-47.55
Syria	3.04	3.20	3.44	-0.08			-0.07		
Timor-Leste	6.18	9.47	9.49	11.09	10.81	12.03	8.69	8.58	8.27
Togo	4.07	4.00	4.00	4.83	4.80	4.80	5.69	5.62	5.62
West Bank and Gaza	3.98			-0.16			-0.16		
Yemen	3.83	7.70	7.70	-10.83	-10.48	-12.72	0.10	0.14	2.39
Zimbabwe	3.96	9.62	9.62	9.59	9.38	10.55	5.03	5.02	4.42

4. SPECIFICATIONS OF SCENARIO PARAMETERS FOR GROWTH AND SHARED PROSPERITY

The text of the paper describes parameter changes for other scenarios in general terms, and detailed files of the interventions, for analysis replication or variation, are available upon request.

FASTER GROWTH
Scenario intervention: *gdprext*
Value varies by country, see table below

Average +2 %					
Afghanistan	10.89	Haiti	2.81	Sierra Leone	9.30
Bosnia and Herzegovina	5.63	Iraq	3.83	Solomon Islands	4.72
Burundi	5.14	Kosovo	8.08	Somalia	*
Central African Republic	3.19	Liberia	12.17	South Sudan	*
Chad	9.95	Libya	6.32	Sudan	6.33
Comoros	4.09	Madagascar	4.89	Syrian Arab Republic	6.72
Congo, Dem. Rep.	6.36	Malawi	6.09	Timor-Leste	8.07
Congo, Rep.	6.74	Mali	6.99	Togo	4.42
Cote d'Ivoire	2.92	Micronesia, Fed. Sts.	2.76	West Bank and Gaza	*
Eritrea	3.73	Myanmar	14.92	Yemen, Rep.	4.97
Guinea-Bissau	4.59	Nepal	6.15	Zimbabwe	*

Countries marked with an "*" are left at the Base Case values and calculated endogenously. Somalia had no values given by the WDI data set, and South Sudan, West Bank and Gaza, and Zimbabwe had negative average growth values.

The scenario parameter *gdprext* works as a target-setting mechanism for the GDP growth rate in the model. In the absence of an intervention, *gdprext* is set to -100 for years beyond 2013, which tells the model to calculate GDP completely endogenously. If the user specifies a value for *gdprext* for any country-year, the model will impose that exogenous value on economic growth, subject only to minor adjustments from endogenous dynamics.

CONSTANT INEQUALITY
Scenario intervention: *ginidomr*
Value, 2010-2100: 1
The value of *ginidomr* in the Base Case is 0, which allows the model to compute Gini endogenously based on the discrepancy in income between skilled and unskilled households. To override this in the model, we set *ginidomr* to 1, which switches off the normal, endogenous computation of Gini, and, in effect, holds Gini constant from 2010 through 2100.

LOWER INEQUALITY
Scenario intervention: *ginidomm*
Value:
2010-2014: 1, 2015-2030: Falling over 15 years to reach .767 in 2030
Like most multipliers in the model, *ginidomm* is set to 1 in the Base Case, which allows Gini to fluctuate according to the endogenous computation detailed in the model's algorithms. When a multiplier is set, the endogenously-computed value of Gini is multiplied by the user-specified value. In our "Decreasing Gini" forecast, we have left Gini to be calculated

endogenously from 2010 to 2014 by keeping the value of *ginidomm* at 1 for those years. In 2015, we set *ginidomm* to .767 and repeat this value through 2030.

GROWTH AND SHARED PROSPERITY

Scenario interventions: *gdprext, ginidomm*
Values:
ginidomm: 2010-2014: 1, 2015-2030: Falling over 15 years to reach .767 in 2030
gdprext: see table for "Faster Growth" scenario above

BETTER INSTITUTIONS

Scenario interventions: *govrevm, govcorruptm, democm, gemm*
Values:
govrevm: 2010-2014: 1; 2015-2020: rising to 1.2; 2020-2030: 1.2
This intervention alters the amount of revenue collected by the government
govcorruptm: 2010-2014: 1; 2015-2020: rising to 2; 2020-2030: 2
This intervention changes the amount of perceived corruption in the state; a smaller value means more, or worse, perceived corruption, and a larger value means more transparent government. Therefore the value rises in the improved institutions scenario.
democm: 2010-2014: 1; 2015-2020: rising to 1.2; 2020-2030: 1.2
This intervention alters the variable *democpolity* within the model. This is a measure of democracy, which is derived from the Polity IV from the Center for Systemic Peace.
gemm: 2010-2014: 1; 2015-2020: rising to 1.2; 2020-2030: 1.2
This intervention alters the amount of gender empowerment within the model. The larger the number, the greater gender empowerment is within a given country.

BETTER SECURITY

Scenario interventions: *govriskm* and *sfintlwaradd*
Values:
govriskm: 2010-2014: 1; 2015-2030: falling to 0.8
This intervention acts on *govrisk*, a variable within the model that represents internal government instability. A lower value is equivalent to lower risk of government failure.
sfintlwaradd: 2010-2014: 0; 2015-2025: falling to -1; 2025-2030: -1
This intervention alters the likelihood of intrastate conflict, where 0 is equivalent to default settings within the model, 1 is equivalent to constant likelihood of conflict, and -1 is equivalent to no likelihood of conflict within a given country. In this scenario, there is no likelihood of conflict in fragile states by 2025.

IMPROVED INSTITUTIONS AND SECURITY

Scenario interventions: *govrevm, govcorruptm, democm, gemm, govriskm, sfintlwaradd*
Values of interventions are taken from the Better Institutions and Better Security scenarios

IMPROVED INSTITUTIONS AND SECURITY EXTENDED

Scenario Interventions: *tfrm, labfemshrm, invm, govhhtrnwelm, edpriintngr, edprisurgr, edseclowrtrangr, edseclowrsurvgr, edsecupprtrangr, edsecupprsurvgr, edterintgr, edexppconv, edexpslconv, edexpsuconv, edprigndreqintn, edprigndreqsur edseclowrgndreqtran, edseclowrgndreqsurv, edsecupprgndreqtran, edsecuppgndreqsurv, edtergndreqint, edtergndreqgrad,*

edbudgon, hlmodelsw, hltechshift, hivtadvr, aidsdrtadvr, hlmortm, hlwatsansw, hlmlnsw, hlobsw, hlsmimpw, hlvehsw, hlmortmodsw, malnm, deathtrpvm, sanitationm, watsafem, hlsolfuelsw, ensolfuelm, hlpm2pt5m, envpm2pt5m, envylchgm, ensolfuelsetar, ictbroadmobilsetar, ictmobilsetar, infraelecaccsetar, infraroadraisetar, sanitnoconsetar, watsafenoconsetar, goveffectsetar, govregqualsetar, gdsm, protecm, xshift, xfdistockm, xfdiwgrm, xportfoliom, xportwgrm, xwbloanr, ximfcreditr, govrevm, govcorruptm, democm, gemm, govriskm, sfintlwaradd, econfreem, migrater

Values for each of these interventions can be given upon request. Interventions that are also included in the Improved Institutions and Security take the same values.