



# SCENARIO SURVEILLANCE ANALYSIS

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# ACRONYMS AND ABBREVIATIONS

CDCS	Country Development Cooperation Strategy
CMU	Cabinet of Ministers of Ukraine
COVID-19	Coronavirus Disease-2019
CPI	Corruption Perceptions Index
CSOs	Civil Society Organizations
DOs	Development Objectives
FDI	Foreign Direct Investment
GDP	Gross domestic product
GOU	Government of Ukraine
HDI	Human Development Index
IFs	International Futures tool
IMF	International Monetary Fund
OSCE	Organization for Security and Cooperation in Europe
R&D	Research and Development
UMLS	Ukraine Monitoring and Learning Support
UN	United Nations
US	United States
USD	United States dollars
USAID	United States Agency for International Development
WHO	World Health Organization

# EXECUTIVE SUMMARY

Ukraine is a land of bright possibilities and bitter realities. Its recent past has been marked by an array of contrary events and trends, such as civil re-awakening and persistent corruption, democratic reform and constitutional crises, societal reconciliation and violent conflict. In light of these counter-balancing phenomena, it can be difficult to assess whether optimism, pessimism, or some degree of a middling realism is warranted when one is attempting to determine where Ukraine is plausibly headed next. Whither Ukraine?

This report attempts to answer this question through a scenario surveillance analysis, where four plausible future development paths are juxtaposed and analyzed to determine what trends and events could lead Ukraine toward each. Through this exercise we find that Ukraine's future is far from forgone. Should the Government of Ukraine fail in achieving many of its recently-set targets—including those for enhanced agricultural yields, attraction of foreign direct investment, increased spending on research and development, improved health outcomes, gender parity, and reduced corruption—its failure will come with a cost. This cost is expected to multiply as fewer objectives are met and more time passes. However, should the government succeed, the compounding benefits for economic growth and society more broadly will be manifold.

## REPORT PROCESS

This report is part of a series of reports provided to the United States Agency for International Development (USAID) through its Ukraine Monitoring and Learning Support platform. The first of these reports was an *Indicators and Warnings Report* meant to track trends across the international system and in Ukraine.<sup>1</sup> This *Scenario Surveillance Analysis* builds upon this previous work by modeling plausible positive and negative futures for Ukraine around the *Current Path* in version 7.59 of International Futures (IFs), a free and open-source integrated assessment model for long-term forecasting and scenario analysis.

While no software can definitively predict the future, IFs forecasts—which are calculated using data and a mix of quantitative modelling approaches—offer a broad and transparent way to think about trade-offs in policy-making. Currently in its fourth decade of development, the model provides forward-looking, policy-relevant material that frames uncertainty around trends across an array of social, human development, and natural systems, and incorporates over 500 variables related to demographics, economics, agriculture, education, energy, security, international politics, environment, technology, health, and infrastructure.

In gleaming insights from IFs' rich analytical framework, the resultant scenario analysis should be viewed in the context of the question: "If this, then what?" By adjusting scenario parameters, we are essentially asking "What if?" and then describing the results. For example, if corruption reforms are stymied and economic growth stagnates, what would that mean for net migration?

Note, however, that the IFs *Current Path* and our alternative scenarios should not be interpreted as prophecies or an attempt at clairvoyance. Instead, these scenarios allow analysts to unpack the relationships and interconnectedness within the international system, tracking causal pathways and

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<sup>1</sup> The *Indicators and Warnings* report was submitted to USAID/Ukraine in October 2020.

identifying second and third order effects and feedback loops. They are meant to be used as thinking tools to understand what outcomes are expected to result from alternative sets of plausible trends and assumptions. Analysts and policymakers can then use this information to effect change and, if given enough lead time, help steer Ukraine toward a brighter future.

The scenarios we analyze for this report are based on those previously developed by the Futures Team of the Global Development Lab at USAID, which sought to answer the question of what Ukraine's development trajectory may look through the year 2025 (Williams, Gale, and Bobick 2016). The Futures Team's four scenarios were built around a two-by-two framework of corruption reform and economic growth outcomes, positing a mixture of positive and negative trends for each, namely:

1. *Post-oligarch Ukraine* — lower corruption and improved economic growth.
2. *Clean but poor* — lower corruption and poor economic growth.
3. *Prosperous corruption* — higher corruption and improved economic growth.
4. *Isolation nation* — higher corruption and poor economic growth

— Williams, Gale, and Bobick 2016, p. 4

Using the IFs *Current Path* as a dynamic baseline, we operationalized these scenarios by using quantitative measures and scenario parameters to approximate the trends and outcomes described by their largely qualitative assessments. It should be noted that the resulting IFs scenarios are intended to represent “macro-level” trends; country experts should use their qualitative judgments to connect the model's results with events “on-the-ground.”

The findings from this analysis will be revisited and updated annually, seeking to reflect the impact of recent developments. Meanwhile, the USAID/Ukraine Monitoring and Learning Support team will engage with the USAID/Ukraine Mission for feedback on how best to support its scenario surveillance needs, as well as use the information to guide strategic learning in the Mission. In this vein, forthcoming *Scenario Surveillance Analysis* and *Indicators and Warnings* reports should be read as living documents that are meant to evolve with the Mission and its Development Objective teams' needs, and be updated to reflect changing conditions on the ground.

## KEY TAKEAWAYS

While it is recommended that the results from the macro-level analysis presented here be considered alongside “on the ground” analyses of policymakers and analysts within Ukraine, our work offers several key takeaways:

- **The benefits to Ukraine's economic growth that corruption and governance reform have the potential to provide are significant.**
  - If Ukraine is able to make *modest* improvements in international business community and expert perception of corruption in line with the assumptions in this scenario analysis, its effect alone is forecast to amount to cumulative gains in GDP equal to \$15 billion by 2030 relative to Ukraine's *Current Path*.
  - If *all* of our positive assumptions related to corruption and governance reform become a reality, then even in the absence of any economic-specific assumptions, this cumulative benefit grows to

\$44 billion (in constant 2011 values) in GDP by 2030—a value nearly equal to one-third the size of Ukraine’s economy as of 2019.

- In the coming decades, Ukraine is expected to continue to face strong demographic headwinds. Given the difficulty of avoiding these realities, particularly those that come with an increasingly aging population, policymakers should perhaps shift their attention toward mitigation efforts.
  - By 2030, Ukraine is expected to transition into the “post-mature” phase of the age structure of societies, where the median age of the population is 45 years or older.
  - If healthcare costs and other strains on government finances are left unchecked, government debt in Ukraine is expected to balloon past a value equal to 100 percent of its GDP within the next decade, a threshold which much economic research has suggested comes with a significant downward impact on future economic growth.
- Despite demographic headwinds, strong, long-term growth is plausible for Ukraine’s economy, though it will require leveraging the synergies that would develop from successes across several areas, including improved agricultural yields, increased foreign direct investment and R&D spending, and corruption and governance reform.
  - Economic improvements across any one issue area will of course be positive for growth, but a whole-of-economy approach would yield significantly improved outcomes.
  - Building a truly robust economy will require governance reforms, not just those targeted at purely economic improvements. Likewise, significantly improved governance will require a strong economy.
- Government analysts should entertain long-term economic forecasts that are less optimistic than recent government reports currently project.
  - In the best-case scenario, Ukraine’s GDP is forecast to reach roughly \$246 billion (in constant 2018 values) by 2030. The Cabinet of Ministers of Ukraine’s recent low-end estimate in their draft *Vectors of Development* report appears to be equal to roughly \$250 billion by 2030.
  - Even if for the sake of a thought experiment, it would be useful for planners to assess their options under less-than-ideal circumstances. This could lead to creative solutions or, at a minimum, highlight government priorities by forcing planners to consider what items on their agenda may need to be cut in the event of austere conditions.
- Individual reforms are forecast to take effect at different rates over time. For corruption-related reforms in particular, at least at the macro-level of analysis presented here, notable benefits for Ukraine’s economic growth are expected to take several years before setting in.
  - Increases in female labor participation rates are expected to provide the fastest results among the interventions modeled here (see Exhibit 28), a consequence of the fact that labor is a primary input of economic growth along with capital and multi-factor productivity.
  - Improvements to corruption perceptions and government effectiveness are expected to take five to ten years before notably affecting Ukraine’s GDP, though their projected long-term effects are among the most significant of the interventions modeled in this analysis.

# PURPOSE AND METHODOLOGY

In brief, this report uses scenario analysis to forecast Ukraine's progress toward the United States Agency for International Development (USAID)/Ukraine 2019-2024 Country Development Cooperation Strategy (CDCS) Development Objectives (DOs). Where possible, scenario results are also compared to targets outlined in the Cabinet of Ministers of Ukraine's (CMU) recent draft *Vectors of Development* report (CMU 2021). The scenarios, described further below, were generated by the Frederick S. Pardee Center for International Futures at the University of Denver's Josef Korbel School of International Studies and are quantitative versions of previously qualitative scenarios developed by USAID's Global Development Lab. The background of this effort, suggestions for how to use this report, and a more detailed description of our methodology is presented below before moving to the results from our analysis of issue areas most relevant to the CDCS DOs. Later sections present the results of our analysis and policy implications that can be derived from these results.

## PURPOSE

To plan for the future, it is necessary to make assumptions about what the future will look like. Often our desire is to know as precisely as possible what sort of world we expect to be living in, where variables of interest are described by point estimates, or a single "best guess," surrounded by a margin of error. While useful in many settings, this type of probabilistic prediction often fails us when examining long-term futures in an open system, such as that which characterizes international relations.

Long-term probabilistic predictions in international relations commonly fail us for two reasons. The first is that error bounds can become so large that they are unable to meaningfully inform policymaking efforts. The second and more serious issue is the *ceteris paribus* (i.e., all else equal) assumption necessary to interpret models results. However, real world policy decisions are rarely made in an environment where all else can be held equal. This is particularly the case with systems, where, as international relations scholar Robert Jervis asserts, "everything else cannot be held constant" (1997, p. 73). As such, models of interactions within and among countries are most useful when they provide not only point estimates but also explanations of causal mechanisms, for example in the form of positive and negative feedbacks.

In the vein of sociologist and systems theorists Niklas Luhmann, our approach is to instead begin by defining a tractable "system rationality" and then "reintegrate the problem of complexity" to the fullest extent of our ability (2016, 136). In other words, we use an integrated assessment model, described below, to create an abstraction of the international system. The abstraction contains causal mechanisms that mirror, though sometimes simply, trends and interactions observed in the real world. It also provides scenario handles, referred to more formally as parameters, which can be adjusted to create various "what-if?" scenarios.

Through scenario analysis, we are offered both a view in to the plausible futures toward which a country like Ukraine could be headed as well as understanding of what trends and events could lead us there. Such is the goal of the qualitative scenarios upon which our scenarios analysis in this report are based.



## BACKGROUND

In 2016, the Futures Team of the Global Development Lab at USAID completed a literature review and workshop meant to support USAID/Ukraine’s refinement of its CDCS. Their “in-country participatory scenario-planning workshop, held at the U.S. Embassy in Kyiv, Ukraine, on September 28, 2016, [involved] about 25 participants from USAID/Ukraine, local [non-governmental organizations], and civil society organizations” (Williams, Gale, and Bobick 2016, p. 3). Based on these efforts, and follow-on analysis by the Futures Team, four scenarios were developed to answer the question of what Ukraine’s development trajectory may look through the year 2025.

The Futures Team’s four scenarios were built around a two-by-two framework of corruption reform and economic growth outcomes, positing a mixture of positive and negative trends for each, namely:

1. *Post-oligarch Ukraine* — lower corruption and improved economic growth.
2. *Clean but poor* — lower corruption and poor economic growth.
3. *Prosperous corruption* — higher corruption and improved economic growth.
4. *Isolation nation* — higher corruption and poor economic growth

— Williams, Gale, and Bobick 2016, p. 4

While addressing many readily quantifiable trends, such as Ukraine’s shrinking population and agricultural productivity, each of the scenarios was presented in largely qualitative terms. A synopsis for each of their scenarios is presented in Annex 2.

In 2020, the Frederick S. Pardee Center for International Futures was brought in to support the Ukraine Monitoring and Learning Support (UMLS) activity. The primary thrust of this effort has been to use the Pardee Center’s International Futures tool to quantitatively model similar scenarios to those developed by USAID and track progress toward the 2019-2024 CDCS DOs. The scenarios in this analysis are built upon those developed by the Futures Team but are by no means identical; rather, they are a best approximation, where differences may exist to adapt our analysis to the IFs modeling framework.

## HOW TO USE THIS REPORT

This report is part of a series of reports provided to the USAID/Ukraine. The first was an *Indicators and Warnings Report* meant to track trends across the international system and in Ukraine along the *Current Path*, a collection of integrated forecasts described below which built using version 7.56 of the Frederick S. Pardee Center’s International Futures tool, also known as IFs.

This *Scenario Surveillance Analysis* report builds upon our previous work by modeling plausible positive and negative futures for Ukraine around our *Current Path* scenario in IFs. To reflect recent refinements in our forecasts, including the inclusion of updated exogenous economic growth forecasts from the International Monetary Fund’s (IMF) *World Economic Outlook* in October 2020, the current path for this report will be slightly different, using IFs version 7.59. While this update will slightly hinder our ability to directly compare this analysis with the *Indicators and Warnings Report*, we believe this loss is outweighed by the gains that come from incorporating more recently available data and knowledge.

The results from our resultant scenario analysis should be viewed in the context of the question: “If this, then what?” By adjusting scenario parameters, we are essentially asking “What if?” and then describing

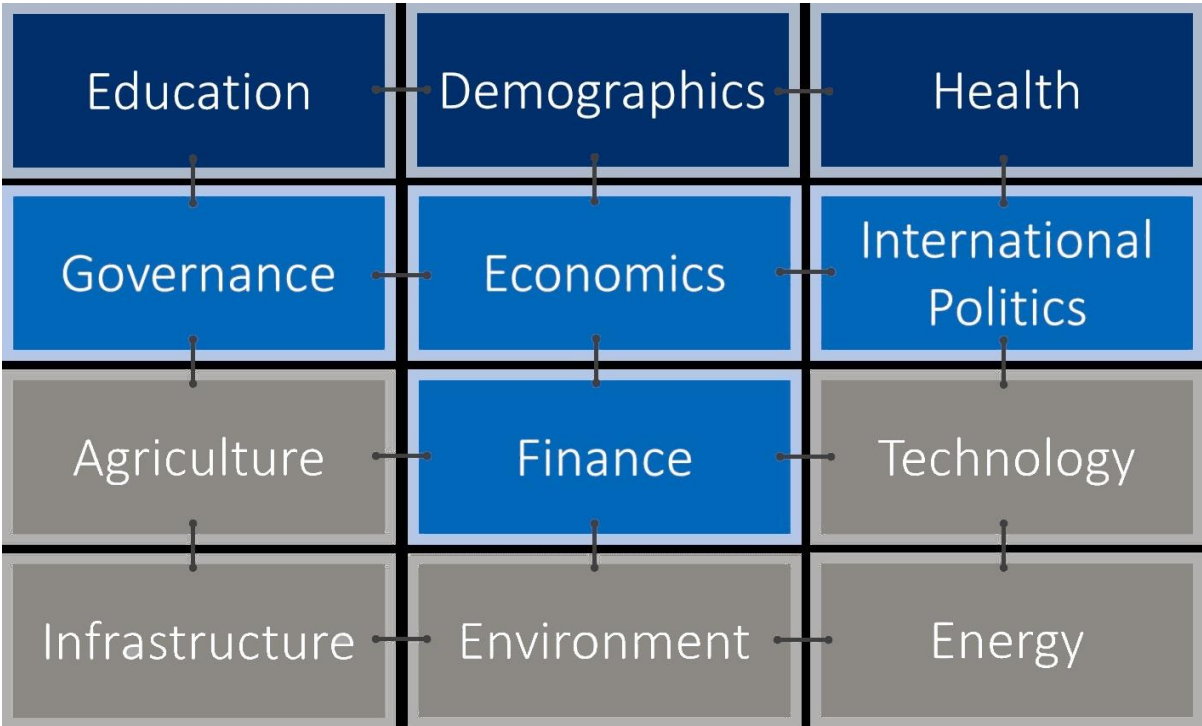
the results. For example, if corruption reforms are stymied and economic growth stagnates—the Futures Team’s *Isolation Nation* scenario—what would that mean for, say, net migration?

Note, however, that the IFs *Current Path* and alternative scenarios presented below should not be interpreted as prophecies or an attempt at clairvoyance. Instead, these scenarios allow analysts to unpack the relationships and interconnectedness within the international system, tracking causal pathways and identifying second and third order effects and feedback loops. They are meant to be used as a thinking tool to understand what outcomes are expected to result from alternative sets of plausible trends and assumptions. Analysts and policymakers can then use this information to effect change and, if given enough lead time, help steer Ukraine toward a brighter future.

## INTERNATIONAL FUTURES

The bulk of this analysis comprises analyzing forecasts across alternative scenarios built using the International Futures (IFs) integrated assessment model, a sophisticated modeling tool for thinking about long-term futures. The IFs model, which is free and open-source, helps users understand dynamics within and across global systems and think systematically about potential trends, development goals, and targets. While no software can definitively predict the future, IFs forecasts—which are calculated using data and a mix of quantitative modelling approaches—offer a broad and transparent way to think about trade-offs in policy-making. The model provides forward-looking, policy-relevant material that frames uncertainty around trends across an array of social, human development, and natural systems, and incorporates over 500 variables related to demographics, economics, agriculture, education, energy, security, international politics, environment, technology, health, and infrastructure.

Exhibit 1: Conceptualization of the IFs’ interconnected human (dark blue), social (light blue), and natural (gray) systems



The IFs model, borrowing from the systems dynamics approach of modeling complex systems, allows users to approximate causal inferences about how interacting systems of various agent classes (households, firms, and governments) at multiple scales (international, national, and subnational) evolve over time, and trace through and isolate the effects of specific interventions. Feedback loops, representing relationships found in real-world systems and built into the structure of IFs, allow the tool to account for the non-linearities observed in phenomena such as population dynamics or endogenous economic growth. IFs is a deterministic, mixed-methods model that draws on and forecasts country- and system-level variables, so it differs from the standard tools used to model complex adaptive systems from less-reducible units of analysis or first principles. Parameters of its forecasts can be adjusted, meaning users can characterize uncertainty by altering the model's baseline assumptions.

Thus, the benefits of integrating our forecasts into IFs are two-fold: 1) we gain a better understanding of how the world works, and 2) we can explore the effect of both expected and disruptive developments by altering model assumptions and comparing resultant alternative scenarios. To this first point, arguably the greatest strength of the integrated systems dynamics models within IFs is “their ability to help us reason through the effects of our actions. We can often think through the direct effects of policies”—including effects that are unintended (Page 2018, 212). To the second point, we can quickly compare results under varying sets of assumptions by altering model parameters. Thus, “[s]cenario analysis of change within anticipated ranges, and potentially change outside of them, links the ‘how’ of world modeling back to the ‘why’” (Hughes 2019, p. 27).

In other words, IFs allows users to create scenarios that are specifically tied to policy interventions or potential game-changing events. For example, users can adjust model assumptions to ask: What if policy X decreases GDP growth by 2% instead of 1%? How will that affect issue area Y? Or, how much would GDP growth need to decline before it becomes a problem for issue Y? Is it plausible that policy Z could have such an effect? Rather than being tied to standard assumptions about statistically-derived confidence intervals (e.g., 95%), IFs allows users to examine forecast uncertainty by exploring a range of policy-derived scenarios and outcomes, which can include the plausible, the implausible, and everything in between.

As an illustration of the utility of this approach to policymakers, IFs is currently used in collaboration with organizations such as: various United Nations (UN) Development Program offices; the African Union's New Partnership for Africa's Development, the European Commission, and the United States (US) National Intelligence Council, which has used IFs as a centerpiece for scenario analysis in several of its *Global Trends* reports. Other notable recent collaborations include: the UN Environmental Program; USAID's Latin America and the Caribbean Office of Regional Sustainable Development; South Africa's Western Cape Provincial Government; and the US Army Future Studies Group.

## IFS FORECAST VALIDATION

Stemming from the Frederick S. Pardee Center for International Futures' recent collaboration with the US National Intelligence Council, our research team subjected the IFs model to a validation exercise. Our goal was to identify areas where the model performs well as well as areas for improvement.

To validate the model's performance, we created a historical projection by rebasing the IFs model back to 1995 and then used that rebased model to “forecast” variables over a 20-year period to 2015. We called this historical projection the *Historical Run*. The projections from the *Historical Run* were then compared to the actual data from the same period in order to judge the accuracy of the model for key variables and indicators at the global, sub-regional, and national levels.

This validation exercise revealed several patterns that impede “knowability,” or themes that help us understand which variables are accompanied by relatively reliable long-term forecasts and why. Specifically, these patterns and relevant examples included the following:

- *Complexity*, both in the real world and computationally, where less complex phenomena are easier to model. Birth rates, with relatively few drivers that have proven stable over time and which result in easily countable outputs (children), are one of the least complex phenomena modeled within IFs.
- *Measurability*, where trends composed of discrete, measurable components allow for full accounting of system dynamics. Energy forecasts can prove difficult in this sense given that undiscovered hydrocarbon deposits are effectively unmeasurable.
- Tendency toward *equilibration*, where equilibrating systems ensure individual forecasts are balanced by one another. For example, supply and demand tend to equilibrate relative to overall prices in market economies. Command economies frequently lack such an equilibration mechanism.
- *Stochasticity*, where events with a known probability but essentially random timing are forecast as smooth trends, a necessary abstraction that offers limited utility in predicting disruptions. An example most affecting IFs forecasts is the occurrence of economic recessions.
- *Tractability*, where events or trends that can easily be altered by human intervention may contrast with a fixed forecasting logic. Examples include migration and responses to a global pandemic, which boil down to individual human decisions.

While apparent in most contexts, Ukraine analysts will note that each of these patterns that impede “knowability” particularly apply to their country of interest. Ukraine’s conflict with Russia is a primary example, being characterized by stochasticity, emergent phenomena (a property of complexity), and tractability (at least in terms of starting conflict; perhaps not in ending it). For this analysis, corruption bears special mention, in that its presence or absence is difficult to measure exactly.

Among the most unpredictable trends is migration—a feature in each of the Global Development Lab Futures Team’s qualitative scenarios. During our validation exercise, large outflows were often missed for countries mired in conflict and inflows to many oil-rich nations and advanced European countries proved to be much greater than expected. This result is in some sense unsurprising given the many forces of uncertainty influencing migration. Specifically, migration is motivated by a complex series of economic and security-related factors. It is difficult to measure in light of free, frequent movement across many borders and the reality that some migrants would prefer to avoid being tracked. The decision to migrate can also be quickly and easily made by individuals or groups, making it highly tractable. While we expect it is unlikely that net inward migration to Ukraine is unlikely to increase significantly in the coming five to ten years, we acknowledge that the IFs forecasts here are characterized by a fair amount of uncertainty.

In light of the results our recent model validation exercise, the trends mentioned above and others affected by these patterns that affect “knowability”—complexity, measurability, equilibration, stochasticity, and tractability—should be considered as a baseline from which analysts can incorporate their own experience-based assessments. While incorporating such expert judgment, however, analysts should be careful to balance between the base-rate fallacy—where assessments based on a broad array of available numerical information are unduly ignored—and anchoring bias—where analysts discount

their own judgment too much in favor of previous assessments (Heuer 1999, 150, 157). Thus, in the context of IFs forecasts, analysts should leverage the insights of the model's results, which are a product of four decades and counting of model development, while appreciating their own assessments, which are often “closer to the ground,” have to offer.

## CURRENT PATH

Several books could be (and, indeed, have been) written<sup>2</sup> about how the *Current Path* within IFs is determined. Briefly, it can be described as an integrated collection of systems dynamics and econometric forecasts of more than 500 variables across social, human development, and natural systems. An in-depth description of the logic behind many of these forecasts and inter-related systems can be found on the Pardee Center's website.<sup>3</sup> Under development since 1980, IFs is routinely updated by a team of analysts with expertise ranging from climate science to political instability to education.

The IF baseline forecast scenario is known as the *Current Path*, and it is often described as representing what the Pardee Center's modeling team currently considers to be the most plausible future, reflecting a continuation of development choices and uncertainties that have characterized patterns of continuity and change in the international system since the end of the Cold War. Note that it is not a baseline scenario that assumes continuity in some key dimensions but stasis in others. Nor is it a linear extrapolation. Rather, it is an attempt to broadly reflect how the world is dynamically unfolding.

For a thorough description of how the *Current Path* is presently forecast to evolve, see the *Indicators and Warnings Report* that preceded this analysis (though the *Current Path* is featured in this analysis as well to contrast with our alternative scenarios). In brief, the *Indicators and Warnings Report* offered several key takeaways. Along the *Current Path*:

- Ukraine's near-term economic growth prospects are expected to be lackluster.
- Corruption perceptions in Ukraine have improved little in recent years and are expected to remain relatively static in the near term.
- Ukraine is a country with above-average quality of life for its youngest members of society, and is expected to remain so.
- Conditions surrounding Ukraine's national security remain highly uncertain; however, several structural factors are expected to exhibit trends in the country's favor.

## SCENARIOS

Using the IFs *Current Path* as a dynamic baseline, we operationalized the Futures Team at the USAID Global Development Lab's scenarios by using quantitative measures and scenario parameters to approximate the trends and outcomes described by their largely qualitative assessments. It should be

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<sup>2</sup> For example, see: Barry B. Hughes, *International Futures: Building and using global models* (Cambridge, MA: Elsevier Ltd., 2019); Barry B. Hughes and Evan E. Hillebrand, *Exploring and shaping international futures* (New York, NY: Routledge, 2006); Barry B. Hughes, *World Futures: A critical analysis* (Baltimore, MD: Johns Hopkins University Press, 1985); and, the five-part book series *Patterns of Potential Human Progress* from the Frederick S. Pardee Center for International Futures (freely available for download here: <https://pardee.du.edu/patterns-potential-human-progress>).

<sup>3</sup> <https://www.du.edu/ifs/help/understand/index.html>.

noted that the resulting IFs scenarios are intended to represent “macro-level” trends; country experts should use their qualitative judgments to connect the model’s results with events “on-the-ground.”

In general, our approach to develop quantitative scenarios approximating the qualitative scenarios introduced above was as follows. For positive scenarios (e.g., *Post-oligarch Ukraine*), we selected relevant parameters in IFs and set targets deemed to be “ambitious but achievable.” In some cases, these involved targets set by other organizations (for example, the World Health Organization’s “best buys” for mortality reduction). In other cases, our research team relied upon heuristics, such as the notion of gender parity in the labor market.

Another element of our scenario development approach involved benchmarking. For certain trends, such as economic growth, this involved comparing our scenario results with future development paths projected by other organizations, including the Government of Ukraine (GOU). For others, such as broad trends in corruption perceptions, we used past trends seen in other countries or in Ukraine at some point in the past, such as Georgia after the Rose Revolution or Ukraine just prior to the Orange Revolution in 2004, as reference points against which to create upper and lower bounds of what future developments are probable.

With ambitious but achievable targets and benchmarks in mind, we selected parameters (i.e., scenario handles) most closely related to the Futures Team at the USAID Global Development Lab’s scenario framework, depicted in Exhibit 2. Note the strong focus on economic development (y-axis) and corruption/governance (x-axis).

Exhibit 2: Depiction of the scenario framework for Ukraine developed by the USAID Global Development Lab’s Futures Team



For the economic dimension, our scenario interventions focused on: agricultural yields, research and development spending, female labor participation rates, foreign direct investment inflows, cardiovascular



disease-related deaths, and, for 2021 only, multi-factor productivity to account for Coronavirus Disease-2019 (COVID-19) vaccine distribution uncertainty. For the corruption and governance dimension, three parameters were adjusted: corruption perceptions, government effectiveness, and gender empowerment. A description of the specific parameter adjustments in IFs is provided in Annex I.

Using a ground-up approach, we adjusted each parameter individually and aggregated these interventions to build up to four composite scenarios. For the *Post-oligarch Ukraine*, interventions for all economic- and corruption/governance-related parameters were adjusted in a positive direction. (Here, we mean positive as in “improved,” not necessarily positive in terms of a larger multiplier or shift factor.) For *Isolation nation*, we employed all negative interventions for economic- and corruption/governance-related parameters. *Prosperous corruption* relied on positive interventions for economic parameters and negative interventions for corruption/governance parameters. Finally, the *Clean but poor* scenario was built using negative interventions for economic parameters, positive interventions for corruption/governance parameters.

Theoretically, additional parameters to those mentioned above and presented in the Annex could have been employed. Similarly, several additional combinations of positive and negative interventions—and endless variations in between—could have been used for this scenario analysis. However, at a certain point, additional scenarios serve to obfuscate rather than illuminate. If three dimensions with positive or negative alternatives were used, eight scenarios would result. With four dimensions there would be 16 scenarios and, if each parameter were treated as a unique dimension with only one positive or negative value, there would be 512 scenarios. Include all possible levels of positive and negative interventions between the upper and lower bounds that we have selected, and the number of possible scenarios approaches infinity.

Instead of opting for increased complexity, we have geared our scenario analysis toward simplicity for several reasons. First, the IFs forecasting framework is significantly complex in its own right. Second, two-by-two frameworks, which are virtually ubiquitous in international relations and cross-national analysis, offer a tractable abstraction that can help us trace causal mechanisms and understand the directionality and expected impact of the most significant interventions. Reality, of course, is more complicated and analysts should keep in mind that each of our four scenarios is an ideal-type, or hypothetical abstractions used to more easily comprehend our complex world. Third, and finally, we have opted to forecast these four scenarios in order to leverage the thoughtful analysis completed by the Futures Team at the USAID Global Development Lab. Quantitative models are most useful when paired with qualitative analysis (Small 2011; Lamont and Swindler 2014). Thus, the scenarios presented in the analysis below are partnered with their qualitative analysis.

In the following section, we describe the results from our scenario analysis and Ukraine’s progress toward the 2019-2024 CDCS DOs. Implications for policymaker action are discussed in the final section of the report.

# ANALYSIS

For this analysis, we examine the diverging impacts of each scenario for an array of issues most salient to USAID/Ukraine's 2019-2024 CDCS DOs. Rather than focusing on each DO individually, an issue area-based analysis highlights their cross-cutting nature. For example, corruption reform in the health sector (DO 1, Intermediate Result [IR] 1.1) is expected to have ripple effects that ultimately, if modestly, reduce the overall burden of infectious disease in Ukraine (DO 4, IR 4.2). Similarly, improved governance (DO 3) and enhanced economic growth (DO 4) reinforce one another in a positive feedback loop, where gains (or losses) for each help (or hinder) the other.

As the goal of this analysis is to make assessments about plausible future outcomes, special attention is given to DO-related indicators and their proxy measurements for which forecasts exist in IFs. Where possible, scenario results are also compared to targets outlined in the CMU's recent draft *Vectors of Development* report (CMU 2021). Thus, this report intends to offer policymakers and analysts insights based on robust, empirically validated integrated assessment built around systems dynamics that mirror interactions seen in the real world.

Highlights from the results of our analysis section include:

- **The benefits to Ukraine's economic growth that corruption and governance reform have the potential to provide are significant.**
  - If Ukraine is able to make *modest* improvements in international business community and expert perception of corruption in line with the assumptions in this scenario analysis, its effect alone is forecast to amount to cumulative gains in GDP equal to \$15 billion by 2030 relative to Ukraine's *Current Path*.
  - If *all* of our positive assumptions are corruption and governance reform become a reality, then even in the absence of any economic-specific assumptions, this cumulative benefit grows to \$44 billion (in constant 2011 values) in GDP by 2030—a value nearly equal to one-third the size of Ukraine's economy as of 2019.
- **In the coming decades, Ukraine is expected to continue to face strong demographic headwinds. Given the difficulty of avoiding these realities, particularly those that come with an increasingly aging population, policymaker should perhaps shift their attention toward mitigation efforts.**
  - By 2030, Ukraine is expected to transition into the “post-mature” phase of the age structure of societies, where the median age of the population is 45 years or older.
  - If healthcare costs and other strains on government finances are left unchecked, government debt in Ukraine is expected to balloon past a value equal to 100 percent of its GDP within the next decade, a threshold which much economic research has suggested comes with a significant downward impact on future economic growth.

These and the remainder of our findings are discussed in further detail below. Given that economic growth is the most cross-cutting issue area across the 2019-2024 CDCS DOs, our model assumptions and outcomes related to growth and productivity are discussed first. This is followed by a discussion of corruption and governance, demographics, health, and national security.



# ECONOMIC GROWTH

In forecasting and comparing Ukraine's plausible trajectories for future economic growth across alternative scenarios, we made several benchmarked assumptions. (The operationalization of these assumptions in IFs is described in Annex 1.) Among these is that land reform will allow Ukraine to significantly boost agricultural yields, reaching similar yields to the US by 2025 and continuing to improve thereafter along Ukraine's 1998 to 2012 trendline. Such a development would roughly translate to a 30% increase in crop yields per hectare, a recently stated goal of the CMU (2021, p. 131). In contrast, agricultural yields along the *Current Path* are not projected to reach US levels until 2035, and in worse than expected scenarios, we assume that yields remain flat at today's levels.

For research and development (R&D) spending, under better-than-expected conditions we assume that Ukraine becomes an innovation economy with government R&D spending as a percent of GDP approaching similar levels to South Korea (~0.5%), a top innovator (Jamrisko and Lu 2020, January 18), by the end of the decade. Our *Current Path* assumption is that government R&D spending holds steady at roughly 0.2% of GDP, and more pessimistic scenarios assume that other needs require Ukraine's government to reduce its R&D spending to 0.15% of GDP.

Scenarios with better-than-expected economic growth trajectories also assume that foreign direct investment (FDI) increases by close to 2% of GDP in the next few years and thereafter begins to track with the average across Eastern Europe, which have exceeded 5% of GDP in recent years. In level (i.e., dollar-value) terms, this would translate to FDI of roughly \$15 billion by 2030, less than half of the CMU's goal to achieve an FDI volume of \$35 to \$45 billion by 2030 (2021, p. 93). The *Current Path* assumes FDI as a percent of GDP remains static at around 4% of GDP. Given that Ukraine's current investment climate is relatively poor due to high corruption perceptions (Vyshlinksy 2020, November 9), our worse-than-expected growth scenario posits only a modest decline in FDI, falling just below 4% of GDP.

While the absolute differences between this analysis and the GOU's most optimistic plausible targets for FDI could indicate that our positive growth scenarios are not optimistic enough, we instead believe this difference is due to extremely optimistic GDP growth assumption from the CMU. A back-of-the-envelope calculation of their GDP forecasts, which are not described explicitly in their recent draft report of vectors of development and associated targets, suggests a low-end projection of GDP equal to \$250 billion by 2030.<sup>4</sup> Converted to 2020 dollars, the IFs *Current Path* forecast project's Ukraine's GDP in 2030 to be roughly equal to \$191 billion, while the most optimistic scenario presented in this analysis provides a forecasted GDP value for Ukraine in 2030 to be equal to \$246 billion.

As part of the scenarios with better-than-expected economic growth, we assume that female labor participation rates reach parity with male workers by 2025, equaling approximately 60% of women 15 years of age and older. The *Current Path* instead assumes the female labor participation increases gradually over the coming years, steadily rising to 50% of women ages 15+ within a decade. In our scenarios with worse-than-expected economic growth, we assume that illiberal attitudes and gender inequalities related to home healthcare burdens in the wake of the COVID-19 pandemic and an aging

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<sup>4</sup> The CMU has set a goal to: "Reach household consumption expenditures at US\$ 150-280 billion (50-60% of GDP in 2030)" (2021, p. 13). Dividing \$150 billion by 0.6 (or 60%), we can calculate that their GDP forecast for 2030 is, on the low end, equal to roughly \$250 billion. Their "target value" for GDP, presumably an aspirational goal, is even higher: US\$300-400 billion (CMU 2021, 8.)

population cause female labor participation to approach that of Tajikistan, at less than 40% of women 15 years of age and older, by 2030.

Health concerns play an additional role in our economic growth projections, where, in better-than-expected growth scenarios, we assume Ukraine adopts the World Health Organization's (WHO) "best buys" and is thus able to reduce mortality by 35,000 people in 2025, a WHO target (2018). For model simplicity, we assume this reduction in mortality is due to improved cardiovascular health, though in reality the WHO target is a cumulative figure meant to cover all non-communicable diseases. In the *Current Path*, we assume that cardiovascular mortality remains fairly constant at around 625,000 deaths per year. Worse than expected growth scenarios assume that stress and the long-term after-effects of COVID-19 increase cardiovascular-related deaths by 35,000 people in 2025—a reverse of the WHO target.

Finally, for 2021, we attempted to capture the uncertainty surrounding Ukraine's recovery from the COVID-19 pandemic by variously assuming GDP growth would be one percent higher or one percent lower than *Current Path* projections for 2021. We justify this uncertainty based upon recent contradictory signals about the state of Ukraine's economic recovery. On the positive side, the country's economy at this writing is starting to reopen under an "adaptive quarantine" that is projected to last through at least the end of March 2021 (Odinstova 2021, January 19), perhaps returning to a fully open state after that point. However, the Ministry of Health of Ukraine expects that all citizens at a high-risk of infection will not be vaccinated until September 2021; their goal is to vaccinate 50% of the population by 2022 (Public Health Center of the Ministry of Health of Ukraine 2020, December 22). Moreover, according to the results of a poll released by the non-governmental Ukrainian polling organization Rating on January 20, 2021, 52% of Ukrainians surveyed said they would not receive the COVID-19 vaccine even if offered free of charge.

Scenarios with positive long-term assumptions on economic growth (*Post-oligarch Ukraine* and *Prosperous corruption*) were given the benefit of the doubt that policymakers capable of implementing such improvements would also be able to handle recovery from the pandemic better than expected. Scenarios with negative long-term assumptions for economic growth (*Clean but poor* and *Isolation nation*) were assumed to be worlds where Ukraine recovers more slowly than expected.

## FINANCE

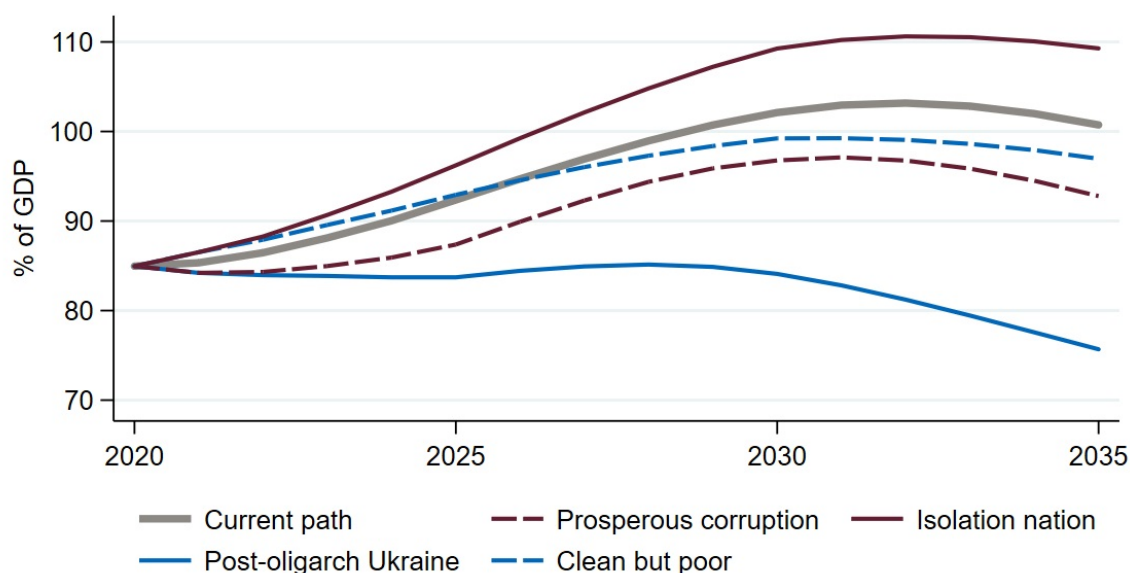
Each of the aforementioned assumptions have a direct impact on Ukraine's plausible trajectories for government finance through 2025 and beyond. Near the CMU's (2021, p. 13) goal for government expenditures to be roughly 15% of GDP in 2030, this value hovers at or slightly above 18% of GDP through 2030 in each of the IFs scenarios presented here. In all but the most optimistic scenario (*Post-oligarch Ukraine*) government consumption is projected to gradually lower to approximately 17% of GDP by 2035.

A starker contrast between government goals and our scenario analysis results for government debt. The National Bank of Ukraine (2020, p. 23) has set a target for public debt not to exceed 40% of GDP by 2025; the CMU (2021, p. 13) has established a similar target of 30 to 40% of GDP by 2030. Compared to each of the IFs forecasts presented in Exhibit 3, these targets are notably ambitious.

Should each of the assumptions in the *Post-oligarch Ukraine* scenario come true, we forecast that government debt will remain near 80% of GDP for the next several years. On the *Current Path*, Ukraine's government debt is expected to equal 100% of GDP by the end of the decade. In the world where

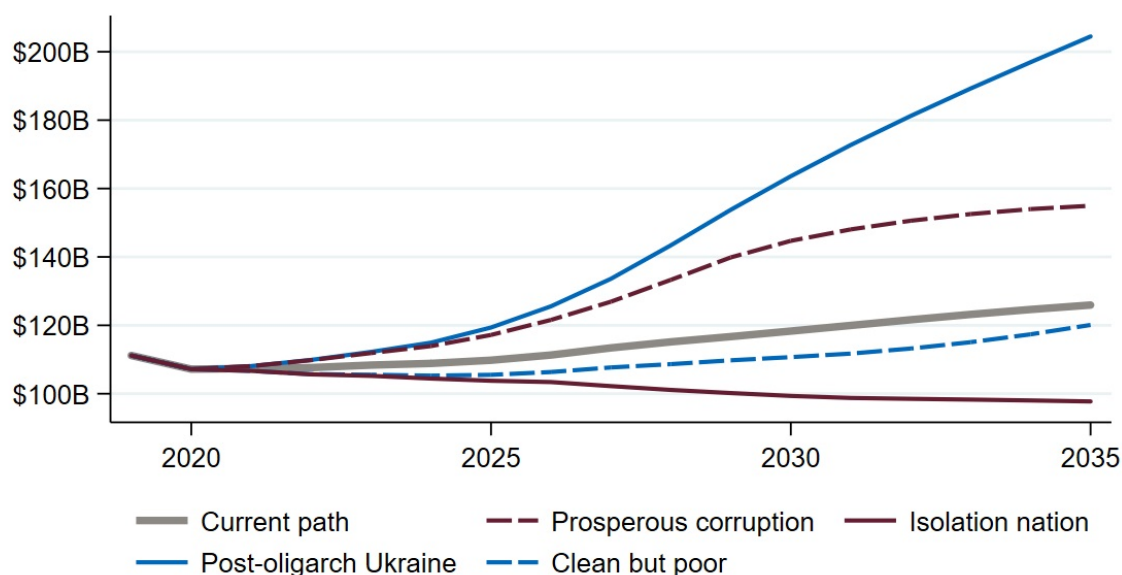
Ukraine becomes *Isolation nation*, this occurs in just five years from now. These less optimistic scenarios offer worrisome conclusions. Several studies have shown that as government debt approaches or exceeds thresholds near 85 to 95% of GDP, economic growth often begins to be significantly negatively affected (Cecchetti, Mohanty and Zampolli 2010; Kumar and Woo 2010; Checherita-Westpahl and Rother 2012; Padoan, Sila, and van den Noord 2012; Baum et al. 2013; Brida, Gomez and Seijas 2017).

Exhibit 3: Forecasts of government debt as a percent of GDP in Ukraine across alternative scenarios



While the difference in our long-term GDP forecasts relative to those by the CMU results in projections for household consumption that are significantly different in level terms, as a percent of GDP Ukraine's household consumption appears to be largely on track with expectations. While the Cabinet's target for 2030 is for between 50 to 60% of GDP (2021, p. 13), IFs projections across each scenario are closer to 70% of GDP. Given the differences in GDP forecasts across each scenario, this results in absolute levels of household consumption in Ukraine by 2030 to be between \$163 billion in a *Post-oligarch Ukraine*, \$144 billion in a Ukraine with *Prosperous corruption*, \$118 billion along the *Current Path*, \$110 billion in a *Clean but poor* Ukraine, and a decline to \$99 billion if Ukraine becomes *Isolation nation*. See Exhibit 4.

Exhibit 4: Forecasts of household consumption denominated in 2011 US dollars (USD) in Ukraine across alternative scenarios

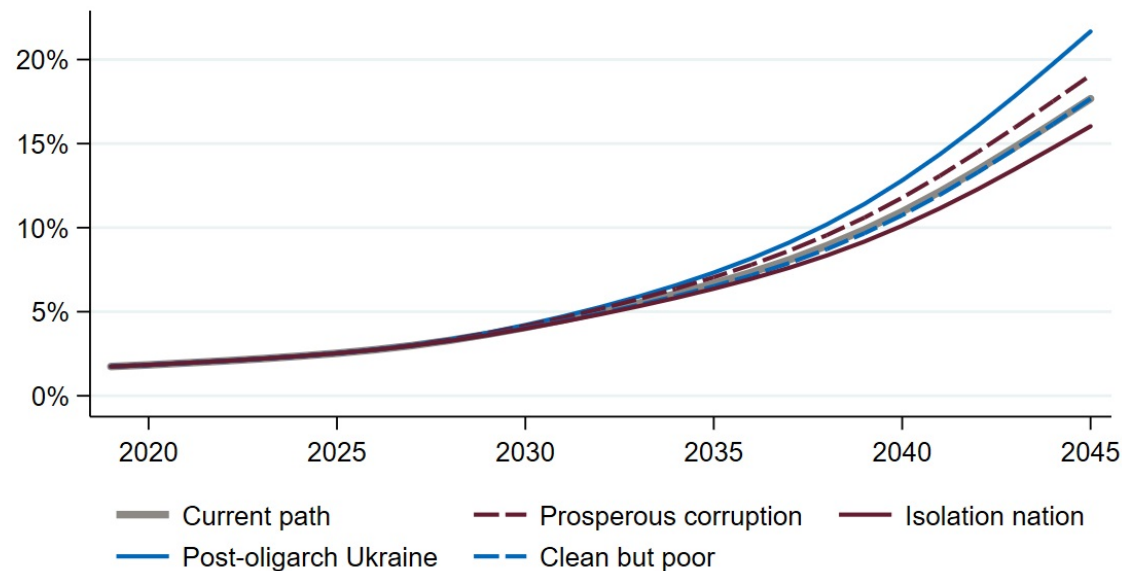


A less pleasing picture appears when household finance is examined through the lens of savings per capita. The CMU has set a goal for the average individual savings per capita of between \$1,800 and \$2,800 (2021, p. 13). In a *Post-oligarch Ukraine*, the best-case scenario presented in this analysis, savings per capita only reach just over \$1,250. Along the *Current Path*, savings per capita in Ukraine is forecast to equal \$841 per person by 2030. In terms of household savings as a percent of GDP, this would rank Ukraine 160<sup>th</sup> out of the 186 countries for which there are forecasts in IFs.

## ENERGY

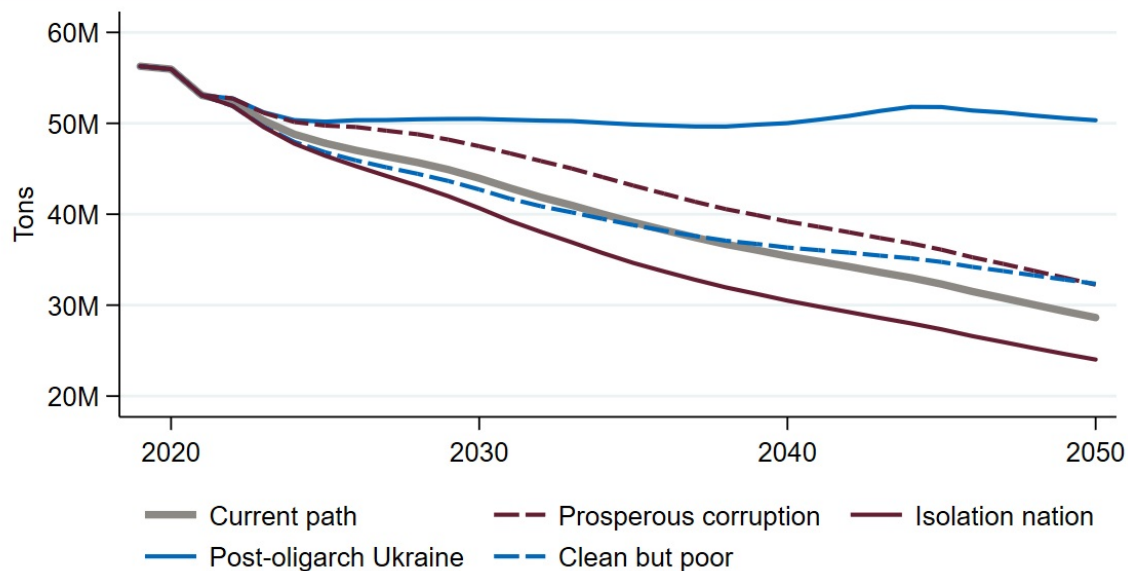
To meet energy consumption needs of Ukraine's households and business, the CMU has set a target to: "Increase the share of generation from renewable energy sources in the total electricity production to 25%" (2021, p. 174). Our energy production forecasts suggest that the GOU's goal of transitioning to 25% renewable energy production is feasible, though likely not until the mid-2040s. That said, long-term energy forecasts are known to be difficult. Aggressive policies, technological breakthroughs, or some combination of the two could rapidly accelerate Ukraine's and the world's transition from fossil fuels to renewables.

Exhibit 5: Forecasts of renewable energy as a percent of total energy production for Ukraine across alternative scenarios



However, policymakers should not conflate a gradual transition to renewable energy sources with a reduction in carbon emissions, at least not in the short term. Under the most optimistic scenario, *Post-oligarch Ukraine*, the country’s economy is projected to transition toward renewable energy sources more rapidly than in all other scenarios. However, increased economic growth produced in this scenario also translates into greater levels of energy consumption in absolute terms. The result is increased carbon emissions relative to the *Current Path*. Whereas the *Current Path* projects Ukraine’s carbon emissions to decline to roughly 40 million tons per year by 2035 and continuing the decline thereafter, a *Post-oligarch Ukraine* is expected to hold steady at 50 million tons per year through the middle of the century.

Exhibit 6: Annual carbon emission forecasts for Ukraine across alternative scenarios



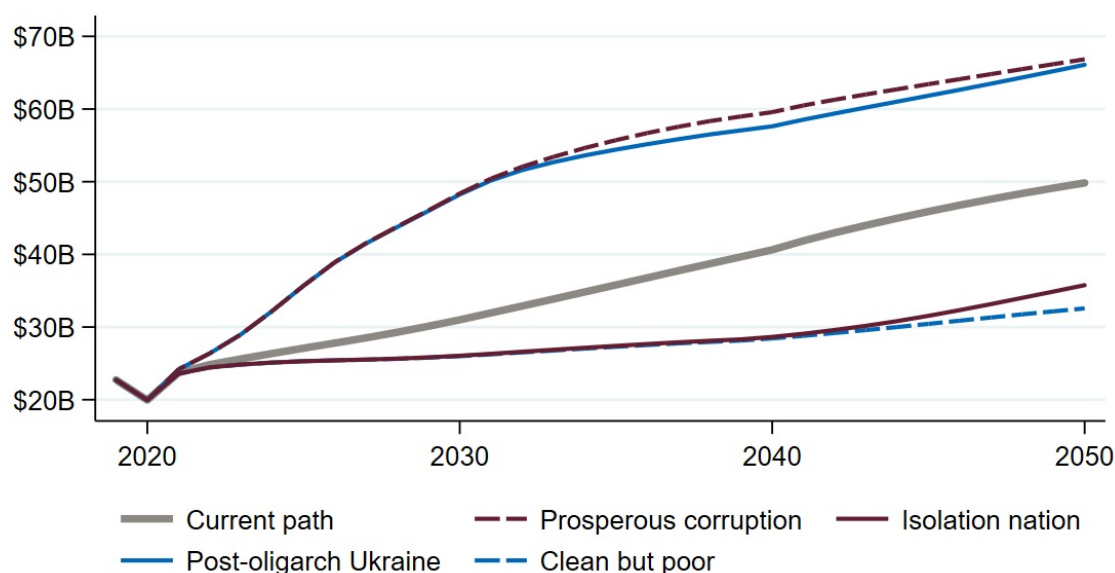
While the effects of present-day carbon emissions could be slow to take effect, the resulting impact on climate change by the end of the century has the potential to be significant. By the year 2100, the average hottest high temperature in Ukraine could increase by anywhere from three and nine degrees Celsius, depending on the global average level of greenhouse gas concentration by that time (Sillmann et al. 2013). In the most extreme of these scenarios, high temperatures at the height of a Kyiv summer could reach into the mid-40s in Celsius, which in Fahrenheit would mean highs approaching and even exceeding 110. Deadly heatwaves, such as those seen in Ukraine and across much of Europe in 2010, are likely to occur more frequently as well (Barriopedro et al. 2011). For this to be avoided—or at least for adverse effects to be mitigated—action by policymakers in not just Ukraine but all around the world will be required, as it is the global level of carbon emissions that increases the likelihood of such events.

## AGRICULTURE

In light of increased carbon emissions and a warming climate, Ukraine's agricultural yields are expected to naturally increase relative to a carbon-neutral world, albeit by a miniscule amount (0.005% by 2030). Should agricultural yields be boosted by 30%, a goal of the CMU (2021, p. 131) perhaps the result of land reform and technological advances, the government is likely to reach other agriculture-related goals as well.

In our positive economic scenarios, which assume yield increases on track with the government's goals, we project that Ukraine will increase its crop exports to equal just over \$45 billion by 2030—exactly the goal of the CMU (2021, p. 131). Along the *Current Path*, depicted alongside the other scenarios in Exhibit 7, this goal would not be reached until approximately 2045; in the other more pessimistic scenarios it would not be reached by mid-century.

Exhibit 7: Forecasts of Ukraine's crop exports in 2011 USD across alternative scenarios



## TRADE

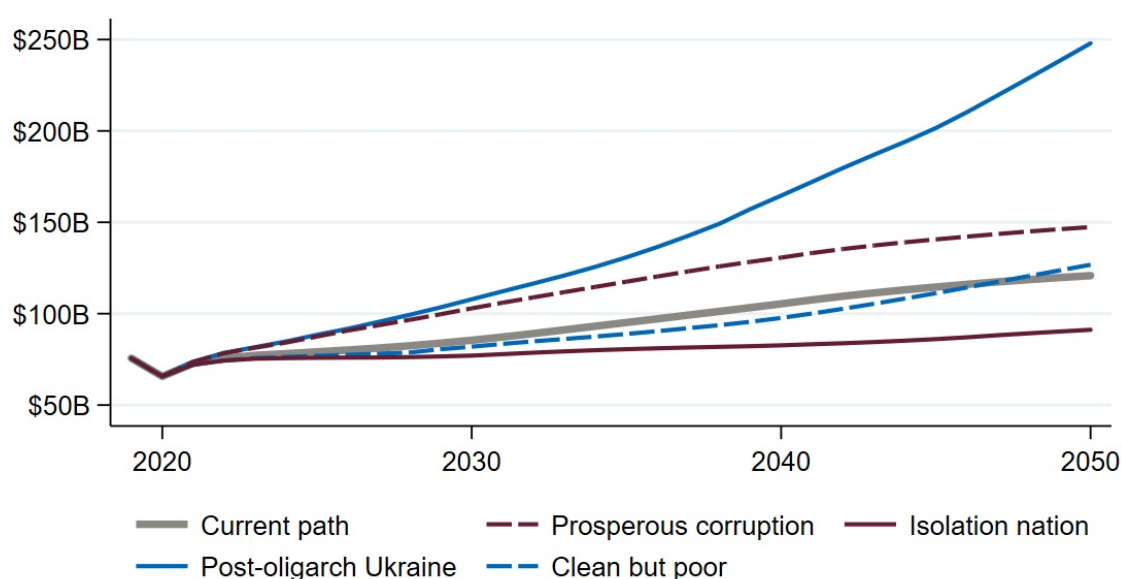
Examining trade more broadly—including agriculture, energy, manufacturing, materials, information and communication technology, and services—our scenarios span between trade that holds relatively flat



through mid-century (a result of *Isolation nation*) and trade that is nearly double that of today in dollar terms by 2035 (a result of *Post-oligarch Ukraine*). In the short run, this difference is largely due to the assumptions we have made about increased or static agricultural yields. Over time, however, GDP growth encourages additional trade across all sectors—a product of “gravity,” a phenomenon where countries tend to increase the bilateral trade as their economies increase in size (Anderson 1979).

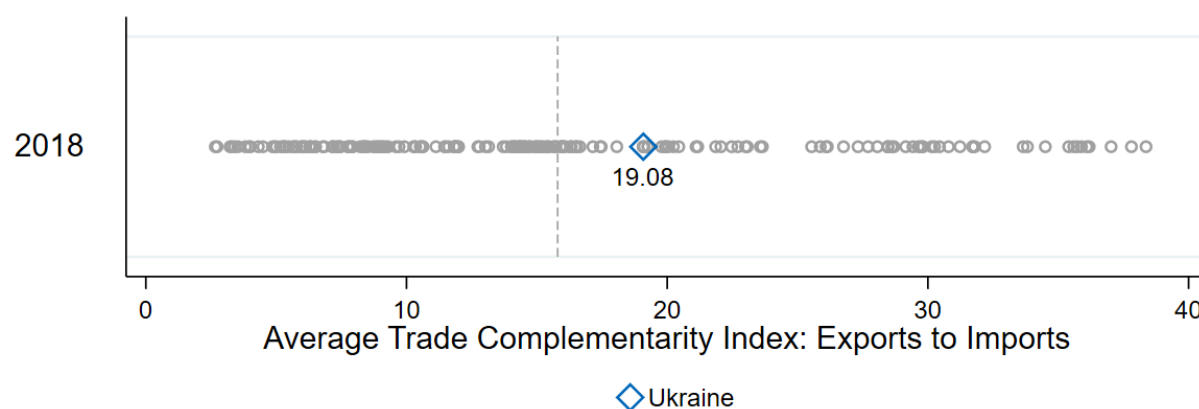
Even with the boost provided by increased agricultural production capacity and the longer-term effects of gravity, our forecasts for goods and services exports from Ukraine across all scenarios fall well short of the 2030 target set by CMU: \$280 to 400 billion (2021, p. 68). If we are to assume this target is denominated in constant 2020 US dollars, then even after converting the IFs forecast values, which are currently denominated in constant 2011 US dollars, a *Post-oligarch Ukraine* is not projected reach the lower end of the Cabinet’s target for exports until the late 2040s. (See Exhibit 8.)

Exhibit 8: Forecasts of Ukraine’s total goods and services exports in 2011 USD across alternative scenarios



To reach such an ambitious target, the GOU will need to promote exports through more aggressive policies than are assumed here. One potential avenue for more aggressive promotion of exports is through the leveraging of Ukraine’s above average trade complementarity, a measure of trade potential between economies, whether or not they are currently trading partners. According to our Trade Complementarity Index, depicted for exports in Exhibit 9, Ukraine’s export sophistication is high. In this exhibit, which uses data for the most recent year available (2018), Ukraine (in the blue diamond) is depicted relative to all other countries (in light-gray circles) and the global mean average (vertical dashed line).

Exhibit 9: Trade complementarity index scores for Ukraine relative to all other economies in 2018



Note: For more information on the TCI methodology, see page 46 of Kabandula et al. (2020). Data source: Frederick S. Pardee Center for International Futures.

Whatever trade path Ukraine embarks upon in the coming years will have ramifications for its national power and influence, discussed further below. First, however, we will discuss their implications for overall growth and productivity, the core drivers of economic power.

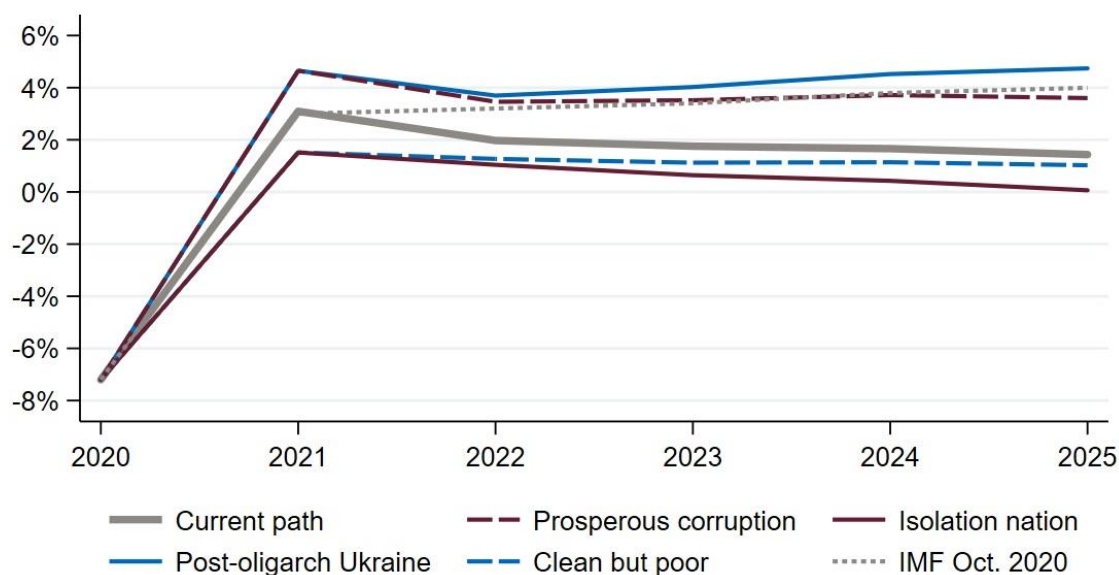
## GROWTH AND PRODUCTIVITY

When each of the aforementioned trends and assumptions is combined, we see a fuller picture of Ukraine's prospects for overall economic growth and productivity. In a world resembling the *Post-oligarch Ukraine* scenario, Ukraine's GDP growth exceeds the IMF's most recent forecast, released in October 2020. However, if Ukraine heads toward a future characterized by the *Isolation nation* scenario, its citizens should brace themselves for the prospect of another recession in the next five years, perhaps one that translates into long-term stagnation and, in a worst-case scenario, an economic depression.

The IFs *Current Path* draws a course somewhere in between these two realities, though veering slightly more toward a somewhat pessimistic vision of slow and slightly declining growth. Indeed, this trend somewhat resembles the worrying, though controversial, notion of secular stagnation, where slow and even no growth becomes the long-term fate of a market economy. While considered to be a non-existent phenomenon by many economists, University of Warwick Professor of Economics Nicholas Crafts (2014) has recently warned that secular stagnation may indeed become a reality for many European economies thanks in largely part to aging, shrinking populations—notable trends for Ukraine especially.



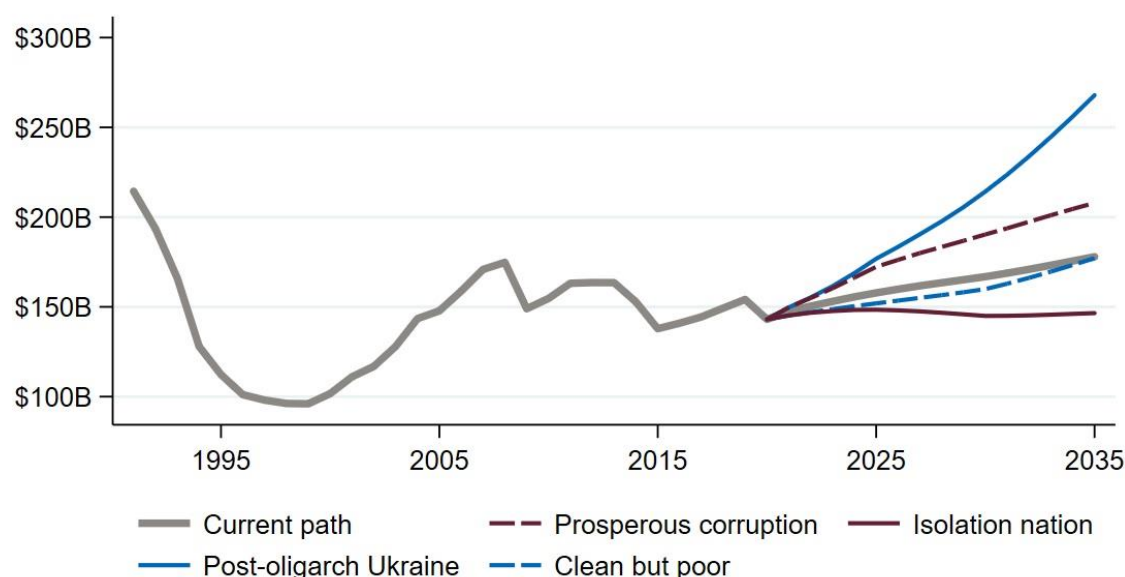
Exhibit 10: GDP growth rate forecasts through 2025 for Ukraine in alternative scenarios



Note: For reference, the National Bank of Ukraine estimated as of July 2020 that Ukraine's GDP growth would equal -6% in 2020 and +4% in 2021; World Bank estimates as of October 2020 were -5.5% growth in 2020 and +1.5% growth in 2021 (PMCG 2020).

Here we should pause to revisit an earlier point: The CMU's long-term GDP forecasts are very optimistic, exceeding those of even the best scenario presented in this analysis, shown through 2035 in Exhibit 11. This is not to say that the Cabinet's forecasts are incorrect or were recorded in error. Indeed, its members' special knowledge of Ukraine and on-the-ground experience may have yielded insights that eluded our forecasts here. However, the apparent optimism in their forecasts should cause policymakers and analysts to take pause. To achieve such long-term growth will require significant improvements relative to long-term trends. And despite the value of expert judgment, deep subject matter expertise has been shown to lead to overconfidence in subject matter experts' forecasts (Tetlock 2006).

Exhibit 11: Long-term forecasts of GDP at market exchange rates in 2011 USD for Ukraine in alternative scenarios



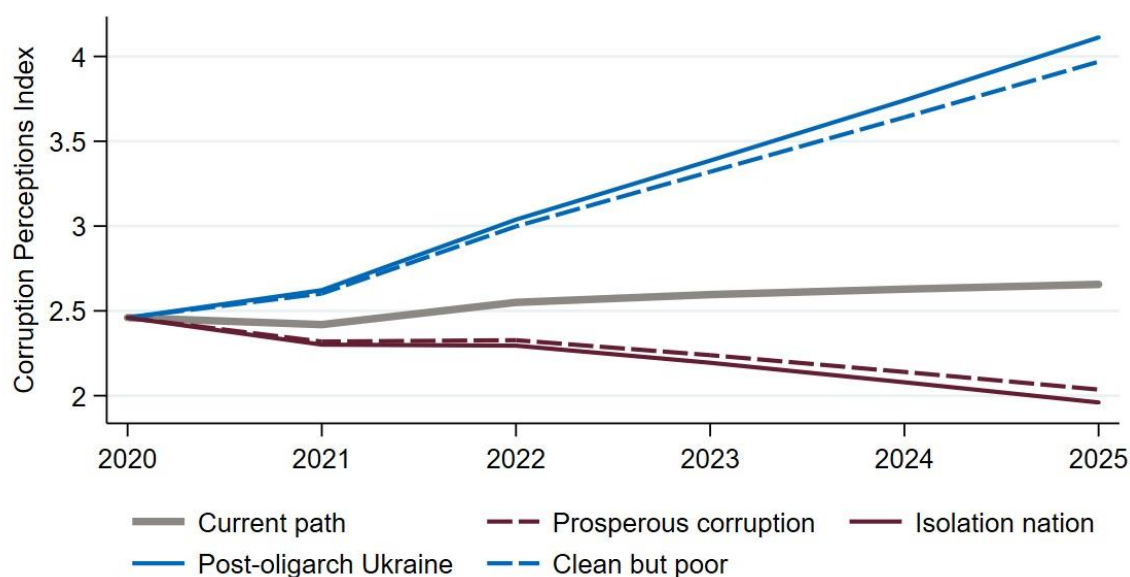
That said, there is reason for optimism. This scenario analysis makes clear that, through meeting the targets laid out in the assumptions at the beginning of this section as well as those described in the corruption and governance analysis that follows, Ukraine has the potential to break out of its recent cycle of economic stagnation.

## CORRUPTION AND GOVERNANCE

According to the macro-level historical data and forecasts of corruption in Ukraine along the *Current Path*, there has been, and is expected to be, little in the way of improvements in terms of corruption reform. From 2019 to 2020, Ukraine's score on Transparency International's Corruption Perceptions Index (CPI) saw a modest improvement, increasing from 30 to 33 (out of 100, where 100 is "very clean") and climbing in the ranks from the 123<sup>rd</sup> to the 117<sup>th</sup> least corrupt country out of the 180 countries for which CPI scores exist. Since 2012, when the CPI was rebased, Ukraine has improved by 7 points on the CPI's 100-point scale and climbed 27 spots in the CPI ranking. Still, Ukraine continues to lag behind nearly all of Europe (with the exception of Russia) in terms of corruption perceptions.

For this analysis, we varied our assumptions across scenarios using benchmarks based on past experiences in nearby countries and in Ukraine itself. In scenarios with better-than-expected corruption and governance reform, Ukraine improves corruption perceptions along a similar trendline to Georgia following the Rose Revolution. Along the *Current Path*, corruption perceptions see minor improvement over the next decade. In more pessimistic scenarios, we assume that corruption perceptions will track similarly to the years just prior to Ukraine's Orange Revolution in late 2004. These assumptions and associated benchmarks are illustrated in Exhibit 12. Their operationalization in IFs is presented in Annex I.

Exhibit 12: Result of varying assumptions about changes in corruption perceptions in Ukraine across scenarios.



Note: For reference, Georgia had a CPI score of 4.1 (on a 0-to-10 scale) in 2009; Ukraine in 2004 scored 2.2 points.

Another component of our analysis involved making assumptions related to government effectiveness. Questions regarding the future quality and stability of Ukraine's governance mechanisms are particularly salient given the recent feud between President Zelenskyy and his country's Constitutional Court. After the President's attempt to remove the head of the Constitutional Court via Decree Number 607/2020 on December 29, 2020, the Court swiftly declared the order to be unconstitutional and thus "legally null and void" (*Ukrainian Pravda* 2020, December 30). The President responded by ordering state security forces to physically block the head of the Constitutional Court from entering the court's building (Sukhov 2021, January 19) setting off what is, in effect, a constitutional crisis for Ukraine. While President Zelenskyy appears to have abandoned his efforts to disband the Constitutional Court, which party will enjoy the more favorable outcome in this struggle remains to be seen.

To reflect the uncertainty of what the future holds for this and other power struggles between the Zelenskyy administration and other elements within the government, we vary our assumptions about the future of Ukraine's government effectiveness across our scenarios. In *Post-oligarch Ukraine* and *Clean but poor*, we assume that Ukraine's government effectiveness improves to the level of Georgia by 2025 and to Poland's by 2030. Along the *Current Path*, depicted alongside our other scenarios in Exhibit 13, Ukraine sees modest improvements that follow a similar trendline to that seen since the early 2000s. In scenarios where changes in the government's effectiveness turn out to be worse than expected, *Prosperous corruption* and *Isolation nation*, government effectiveness is assumed to return to recent lows seen around 2010 and 2011 before returning to a path of gradual improvement through 2035 and beyond.

Exhibit 13: Result of varying assumptions about changes in Ukraine's government effectiveness across scenarios.



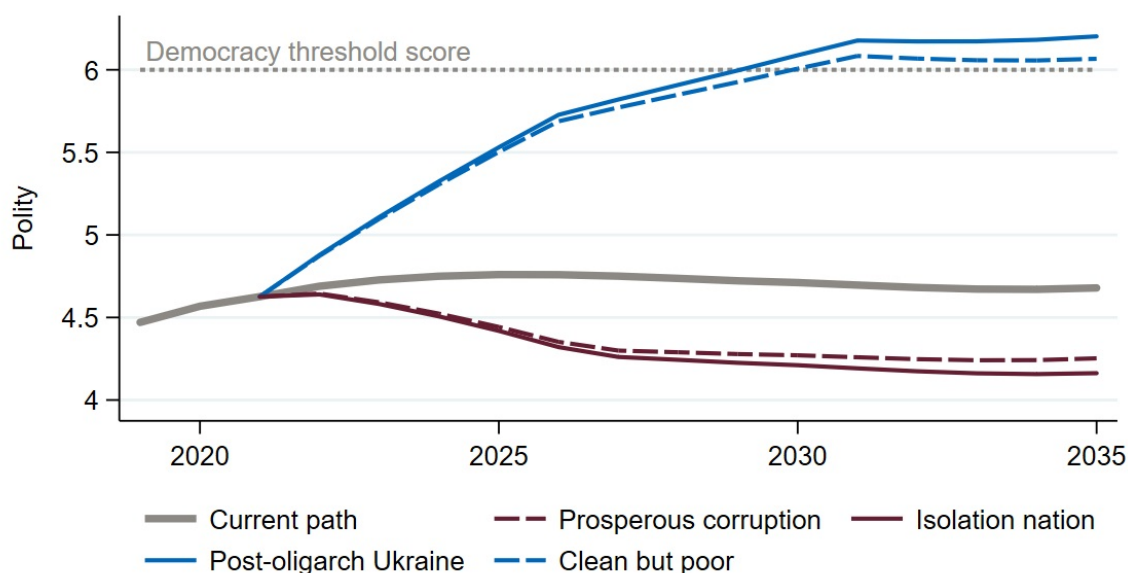
A final set of assumptions involves changes in gender empowerment. In positive scenarios, gender empowerment in Ukraine through 2025 sees similar improvements to those seen on average across Europe from 1995 through 2010. Along the *Current Path*, our gender empowerment measure—which is meant to broadly capture women’s level of political participation relative to men, their economic participation and freedom in economic decision making, and their average potential income—remains static for the next decade. In negative scenarios, gender empowerment backslides, causing Ukraine’s women’s movement to lose two decades-worth of progress. The follow-on effects of these assumptions involve increases or decreases in Ukraine’s overall social and economic stability.

## DEMOCRACY AND CIVIL SOCIETY

The total impact our varying assumptions about changes in corruption and governance reform across Ukraine is a change in our projections for the country’s potential for increased democratization in the coming decade. According to the 20-point (-10 to +10) Polity scale from the Center for Systemic Peace, Ukraine is teetering on the edge of anocracy—a form of governance with both autocratic and democratic qualities—and democracy. As illustrated in Exhibit 14, whether we should expect Ukraine to make this transition depends on our assumptions for corruption and governance reform.

Along the *Current Path*, our forecast suggests that structural factors are expected to hold Ukraine static in its current position through the end of the decade. And while reform is not expected to transform Ukraine into a “full democracy”—a 10 on the polity scale, a score which only 32 out of 167 countries could claim in 2018 and which did not include the US—the scenarios outlined in *Post-oligarch Ukraine* and *Clean but poor* forecast a clear, long-lasting transition to a truly democratic system of governance within the next decade.

Exhibit 14: Forecasts for Ukraine's projected level of democracy across scenarios



Note: On the Center for Systemic Peace's 20-point Polity scale, -10 to -6 indicates autocracy, -5 to +5 indicates anocracy, and +6 to +10 indicates democracy.

What micro-level mechanisms could lead to such a transition? Our forecasting framework is unable to directly model specific, micro-level elements of civil society (i.e., elements that are measured below the aggregate country level of analysis); however, it is clear that civil society organizations (CSOs) will play a critical role in determining Ukraine's future, specifically with regards to corruption and governance reform but also indirectly for each of the issue areas explored in this analysis. If adequately organized and resourced, CSOs in Ukraine have the capacity to spur continued civic engagement and citizen-led change (Kutz and Palyvoda 2006). This will require mechanisms for consolidating CSOs' power and resources through communication and collaboration on advocacy movements. Indeed, successful anti-corruption initiatives are often based on cohesive coalitions that involve journalists and the media as active partners (Bader et al. 2019).

Post-Euromaidan, Ukraine's civil society has grown and developed enormously (Shapovalova and Burlyuk 2018). However, the long-term vitality of several organizations is threatened by their lack of financial diversification and locally-sourced funding. According to a recently compiled dataset, "Of the anti-corruption organizations [in Ukraine tracked by the dataset's creators] which have sources of funding beyond contributions of their own activists, almost all funding comes in the form of grants from international organizations and Western governments" (Bader et al. 2019, p. 16). Additionally, Ukraine has seen uneven civil society development across regions, with significant disparities in capacity between Kyiv-based and regional CSOs (Shapovalova and Burlyuk 2018, p. 32). The process of establishing local sources for funding and creating new tools of local democracy building would make citizen participation more accessible and feasible.

## ECONOMIC BENEFITS OF CORRUPTION REFORM

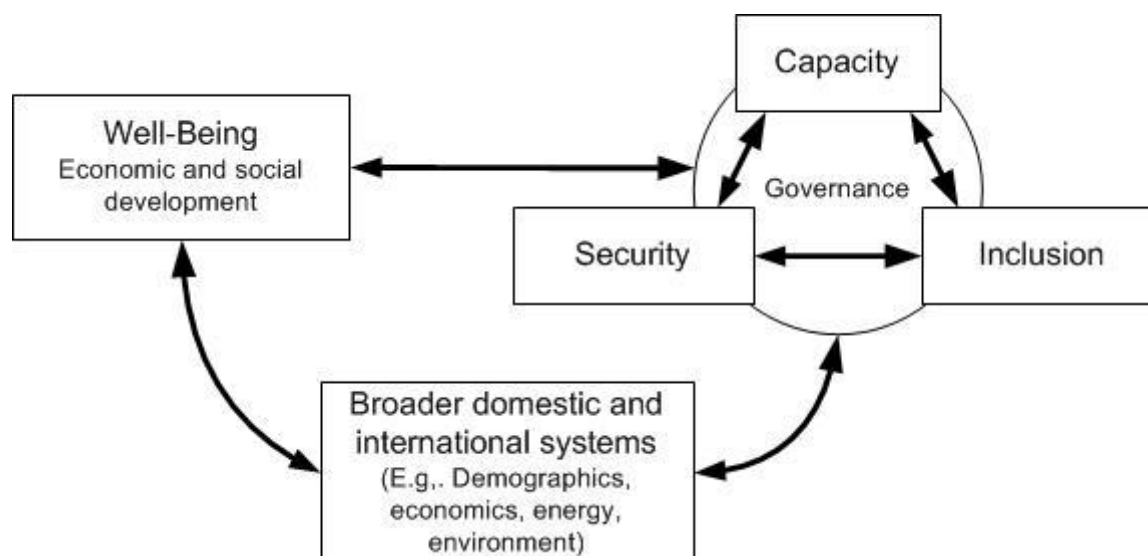
Before moving on from our discussion of the interventions and expected impacts of the full scenarios used in this analysis, it is worth examining the potential economic benefits of corruption specifically. To do this, we have created a separate scenario that intervenes only on the corruption perception

parameter, leaving all other variables to follow their expected trend in the IFs *Current Path* scenario. In this way we can estimate, in general terms, the degree to which corruption is holding back Ukraine's economy.

If Ukraine is able to make *modest* improvements in corruption perception in line with the assumptions in this scenario analysis, its effect alone is forecast to amount to cumulative gains in GDP equal to \$15 billion by 2030 relative to Ukraine's *Current Path*. If *all* of our positive assumptions about corruption and governance reform become a reality, then even in the absence of any economic-specific assumptions, this cumulative benefit grows to \$44 billion (in constant 2011 values) in GDP by 2030—a value nearly equal to one-third the size of Ukraine's economy as of 2019.

The causal pathway for these potentially dramatic gains is illustrated in Exhibit 15. Corruption reform and improved governance drives an increase in social capital, increasing multifactor productivity, which, in addition to labor and capital supplies, translates into economic growth. Economic growth then increases public leaders' capacity to govern, creating a positive feedback loop that further boosts growth. In other words, a government's ability to govern—an ability that is determined by its inclusivity, capacity to reduce social and economic ills like corruption, and its internal security—both influences and is influenced by broader domestic and international systems, including those involving demographics, economic factors like trade and growth, and others. A similar bi-directional relationship of cause and effect characterizes the connection between these systems and societal well-being, as well as that between well-being and governance.

Exhibit 15: Conceptual diagram of the linkages between governance, development, and other major systems represented in IFs.



## DEMOGRAPHICS

Ukraine's long-term demographic prospects are bleak, as its concurrently shrinking and aging population serve both as an input to and an outcome of its less-than-ideal economic prospects. To reverse these trends in the near or even long term would likely require significant inward migration—a tall order, given the relatively unenticing employment opportunities Ukraine has to offer. Increased migration would also come with the likely pushback from Ukraine's unemployed citizens, who might not appreciate more competition with foreign workers. Indeed, nativist backlash has become a common

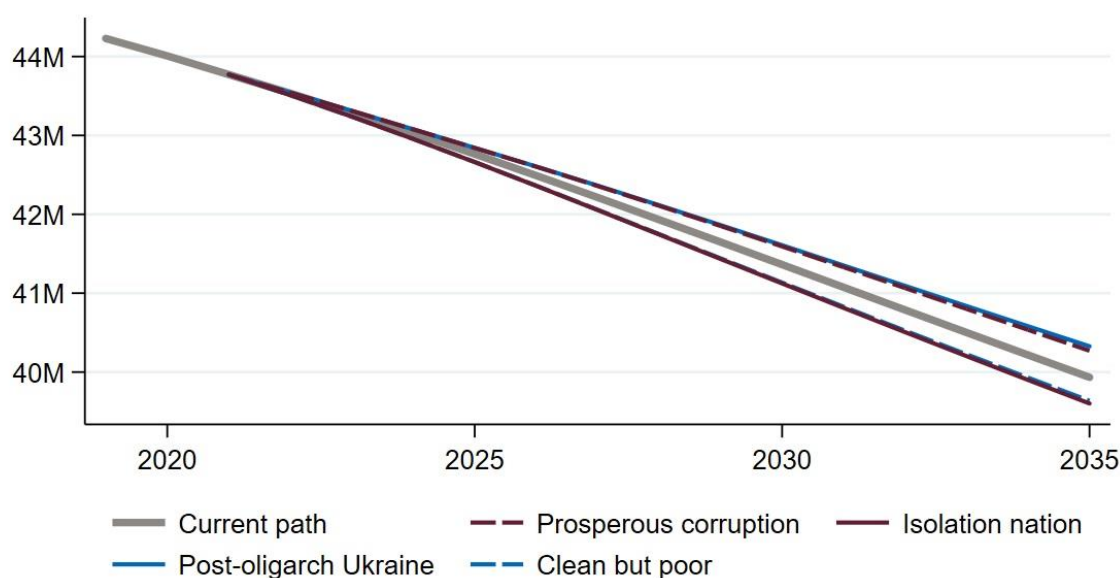


feature in other Western countries that have experience an influx of migrants in recent years (Klaus and Pachocka 2019)

## POPULATION

The CMU has set goals for the country to increase its birth rate and reduce its death rate from now through 2030 (2021, p. 334). However, both seem unlikely even in the event of improved outcomes assumed by our more optimistic scenarios in this analysis. It is unclear what causal mechanisms would lead to meaningful increases in birth rates based on the government's current plans for reforms. While unlikely to decrease, scenarios where Ukraine achieves the WHO "best buys" for improved health with regards to non-communicable disease show a temporary halt in Ukraine's crude death rate through 2025 before all forecasts then begin to project a continued increase in deaths rates due to the country's aging population.

Exhibit 16: Forecasts of Ukraine's population across scenarios



Even if death rates see a short-term reduction relative to the *Current Path*, Ukraine's population is likely to continue to fall barring significant increases in migration—something IFs results do not suggest will happen. That said, a major net increase in inward migration is technically possible. As noted in the earlier discussion of our methodology and the patterns of "knowability" that validation exercises for IFs have revealed, migration has often proven to be more difficult to accurately predict than most trends. That said, if anything, our past forecasts have underestimated outward migration from Ukraine.

## AGING

Across all scenarios in this analysis, Ukraine's population is expected to continue to age. Our forecasts are essentially equivalent across all four scenarios with regards to median age of the population, advancing from roughly 41.5 today to approximately 43 by 2025 and 45 by 2030 (plus or minus one-tenth of a year). In the negative economic scenarios, the ratio of elderly to working-age individuals does decrease slightly (from 0.303 in the *Current Path* to 0.3005 by 2025 and from 0.3349 to 0.3282 by 2030),

though this is largely a mechanical outcome of decreased cardiovascular health and, thus, more Ukrainians dying at a younger age.

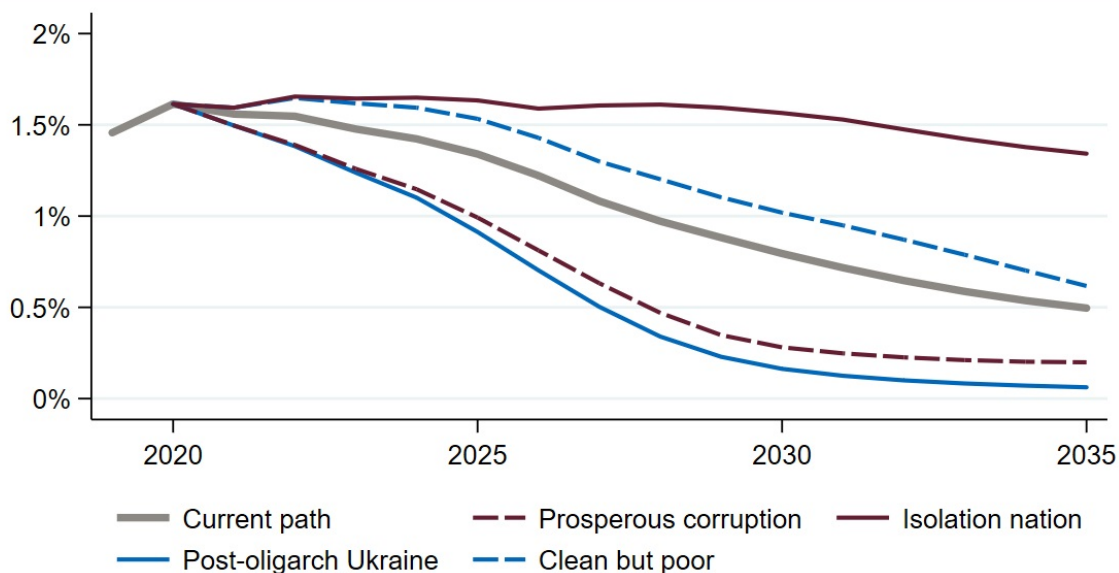
In the parlance of demographers, as the median age of the population exceeds 45 years of age, Ukraine will enter the “post-mature” phase of the age-structural transition of societies. Here, policymakers must “deftly manipulate a full range of social and fiscal policy levers in order to mediate, and adapt to, the cost burdens that are poised to descend upon their pension and healthcare systems” (Cincotta 2021, August 2).

## HUMAN DEVELOPMENT

The assumptions relied upon for each scenario play a somewhat stronger role in our demographic projections with respect to Ukraine’s score on the Human Development Index (HDI). Along the *Current Path*, Ukraine is forecast to rank 96<sup>th</sup> of the 186 countries in IFs in 2030 for the HDI, a result of gradual improvements in Ukraine that are slightly exceeded by much of the world. (Ukraine currently ranks 74<sup>th</sup> among the 189 countries tracked by the UN Development Programme in 2020.) In a *Post-oligarch Ukraine*, its performance is slightly better, ranking 88<sup>th</sup> of IFs’ 186 countries in 2030. Among the worst of outcomes, Ukraine’s HDI tracks fairly close to the *Current Path*, with a ranking in the *Isolation nation* scenario that slips only to 98<sup>th</sup> place.

The HDI is a product of citizens’ standard of living, educational attainment, and life expectancy. Educational attainment is relatively unaffected across all four scenarios—an unsurprising result, given Ukraine’s already high level of educational attainment, which, at about 10 years of education per student on average, is roughly equal to the minimum standard for students in the United Kingdom. However, economic improvements have the potential to significantly improve outcomes for Ukraine’s poorest citizens in the coming decade. As illustrated in Exhibit 17, the percentage of the country’s population living in poverty could hold steady at greater than 1.5% through 2030, or, if all positive assumptions in this analysis come true, be reduced to less than one-fifth of one percent (0.16% in *Post-oligarch Ukraine*).

Exhibit 17: Forecasts of Ukraine’s population living in poverty, as measured by a \$3.10/day threshold, across scenarios





As indicated earlier in Exhibit 15, each of these demographic trends is intricately related to Ukraine's future path with regards to economic well-being, governance, and other issue areas. In few respects are these connections clearer than when examining health outcomes, which are discussed next.

## HEALTH

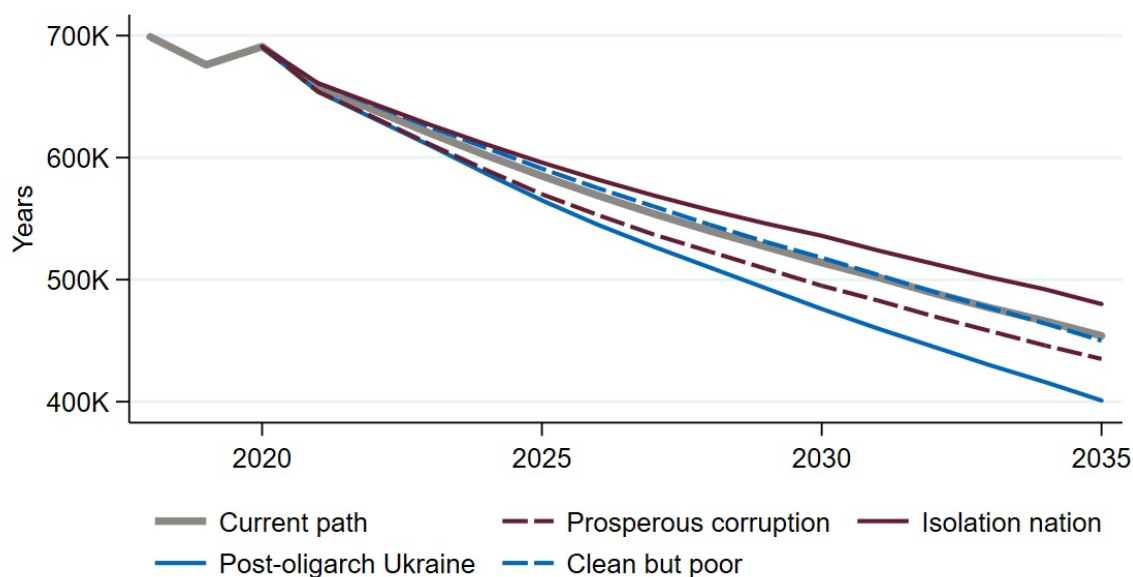
Ukraine's near-term prospects, when viewed through the lens of its healthcare system, are at the same time promising and concerning. In relation to children's health outcomes, Ukraine continues to perform well above the global average. As today's children grow into adulthood, however, they are likely to face a different kind of healthcare problem—paying for the debts incurred by their aging friends and family.

For this scenario analysis, a single intervention was used to differentiate across scenarios. In positive economic scenarios, Ukraine is assumed to have enacted WHO “best buys” and reduced mortality by 35,000 people as of 2025. We use cardiovascular disease—Ukraine's top cause of death as of 2020—a proxy for all non-communicable disease for the sake of modeling simplicity and to ease interpretation of results. Along the *Current Path*, cardiovascular disease death rates hold steady. In more pessimistic scenarios, stress induced by hard economic times and the long-term after-effects of COVID-19 are assumed to increase deaths by 35,000 people in 2025 relative to the *Current Path*. The operationalization of these assumptions in IFs is presented in Annex 1.

## BURDEN OF DISEASE

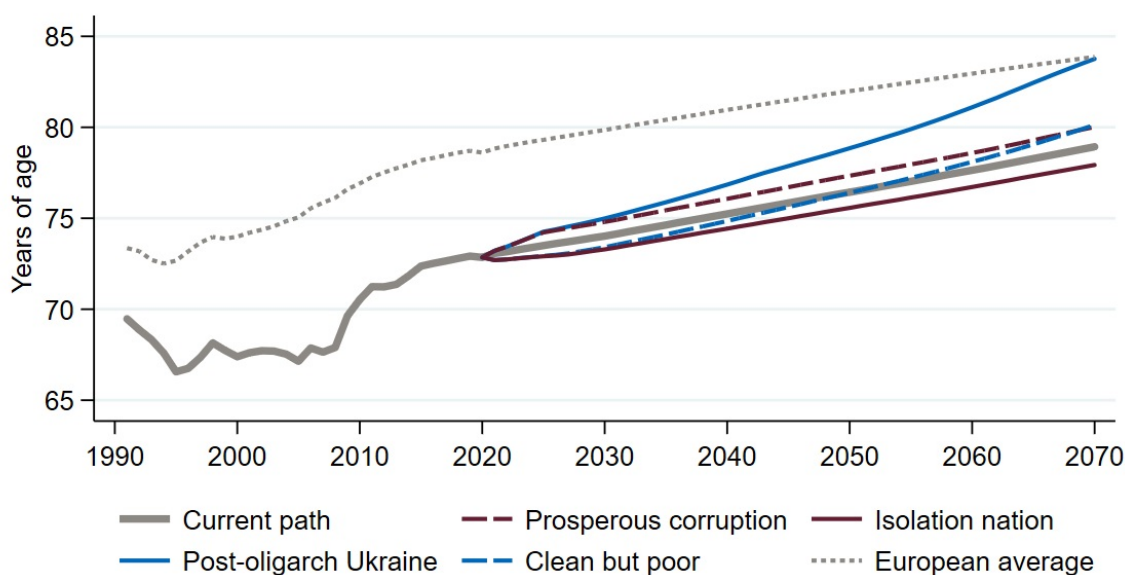
While our scenario assumptions surrounding cardiovascular health have clear, direct effects on our forecasts related to the burden of non-communicable disease in Ukraine, less direct but equally as important are the effects of the collection of economic and governance-related assumptions on the burden of communicable disease, a focus of USAID/Ukraine's 2019-2024 CDCS DO 4, IR 4.2. By 2035, the gap in years of Ukrainian life lost due to communicable disease between our scenarios is equal to more than 100,000. (See Exhibit 18.) This is the equivalent of all present-day residents of Kamianets-Podilskyi, estimated to be Ukraine's 45<sup>th</sup> largest city as of 2019, enjoying a full extra year of life before passing on.

Exhibit 18: Forecasts of years of life lost due to communicable disease in Ukraine across alternative scenarios



In terms of life expectancy across Ukraine, the CMU have recently set a goal to increase Ukrainian's life expectancy to match "not less than the European average" by 2030 (2021, p. 334). Even in our most optimistic of scenarios, however, this improvement in health outcomes is a tall order. Our *Current Path* forecasts in IFs project that the average life expectancy across Europe is expected to grow to nearly 80 years of age by 2030. Even in a *Post-oligarch Ukraine*, we do not forecast that Ukraine will reach the average life expectancy in Europe for several decades, perhaps as late at 2070 according to the current version of our model.

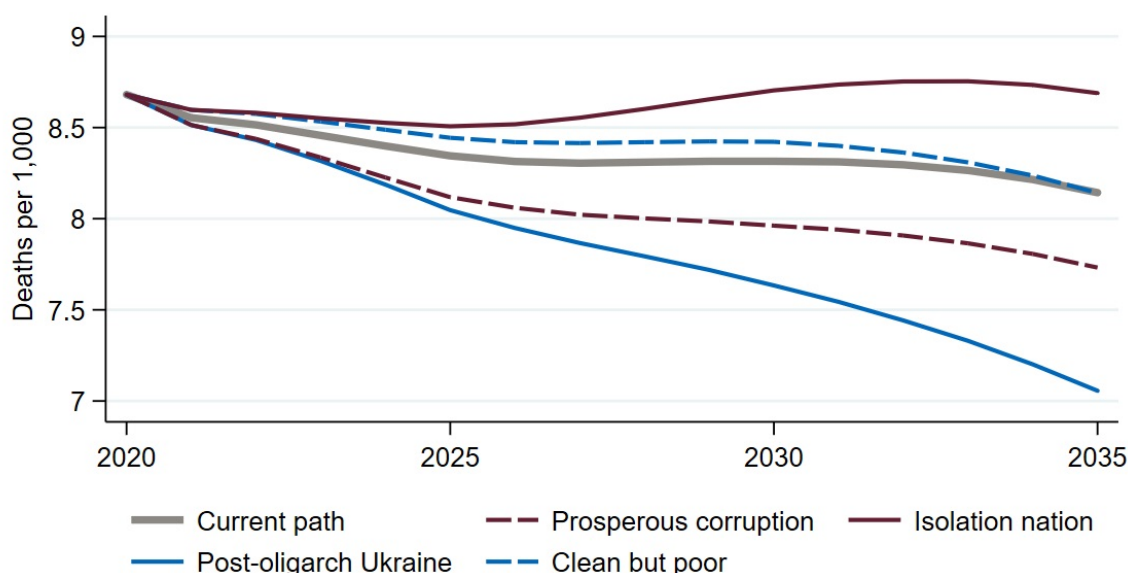
Exhibit 19: Forecasts of Ukrainian's average life expectancy across alternative scenarios relative to the European average



## CHILD HEALTH

Ukraine is, and continues to be, an excellent place to be born in terms of children's health. Its infant mortality rate, neonatal mortality rate, stunting rate are all well below world averages and are expected to remain that way. Still our scenario analysis indicates that Ukraine has room from improvement. (Relative to the Europe Union average, Ukraine lags behind.) In our *Isolation nation* scenario, mortality rates of children under five years of age hold relatively constant around 8.5 deaths per thousand children from today through 2035. *Post-oligarch Ukraine* sees this value drop to just over 7 deaths per thousand children, more than one-tenth of a percent when evaluated in deaths per hundred children. The results of these and our other scenarios are presented in Exhibit 20.

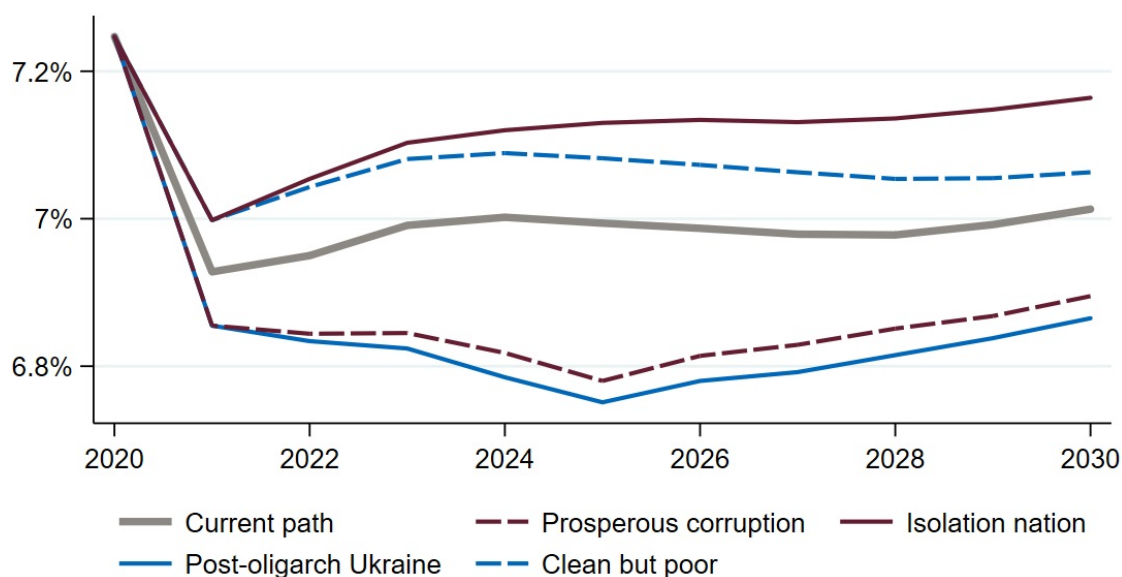
Exhibit 20: Forecasts of child mortality rates in Ukraine across alternative scenarios



## HEALTH COSTS

As Ukraine's children grow into adulthood, they are expected to face a different kind of healthcare challenge: debt. Already, the sum of healthcare costs in Ukraine are equal to more than 7 percent of the country's GDP. Varying in part based on how well the country recovers from the COVID-19 pandemic, these costs are forecast to range between roughly 6.7% and 7.1% of GDP by 2025, as illustrated in Exhibit 21.

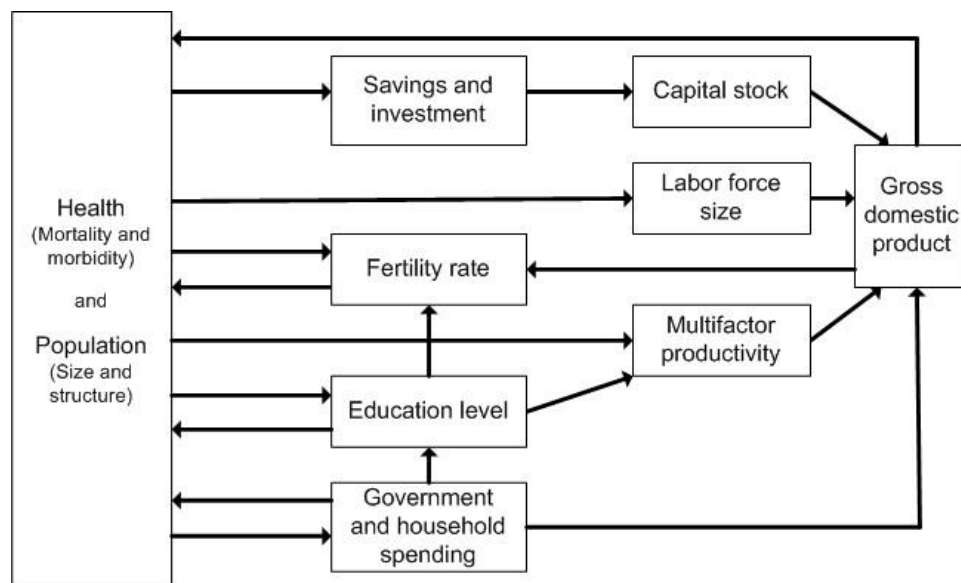
Exhibit 21: Forecasts of public and private health expenditures as a percent of GDP in Ukraine across scenarios



Leading among the drivers of increased healthcare costs are those related to cardiovascular disease, which currently sum to roughly \$2.1 billion annually (in constant 2011 U.S. dollars). Trailing relatively close behind are costs related to unintentional injuries (\$2 billion) and other non-communicable diseases (\$1.5 billion as of 2020).

If healthcare costs and other strains on government finances are left unchecked, government debt in Ukraine is expected to balloon past a value equal to 100 percent of its GDP within the next decade along the country's *Current Path*, a concern discussed above along with our economic growth projections. As illustrated in Exhibit 22, poor health outcomes and their associated costs can, through a variety of mechanisms, hinder GDP growth—the driving engine of a country's economic power and, ultimately, its national power.

Exhibit 22: Conceptual diagram of the linkages between health, population, and GDP, as modeled in IFs.



# NATIONAL SECURITY

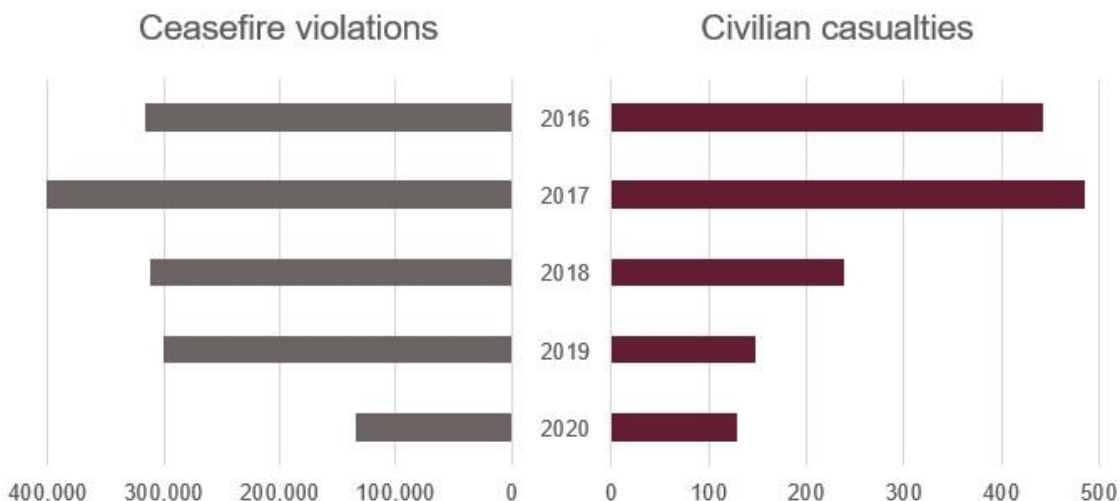
Conditions surrounding Ukraine's national security remain highly uncertain; however, several structural factors are expected to exhibit trends in the country's favor. Having already significantly reduced its energy dependence on Russia in recent years, Ukraine's overall dependence upon energy imports is expected to continue decreasing. Meanwhile, Russia is expected to become increasingly dependent upon its own energy exports for economic growth. If oil and gas prices remain low, this could bode ill for Russian attempts to return to Soviet-era domination in its near-abroad.

## RUSSIAN AGGRESSION

Conflict is, by its very nature, uncertain and often unpredictable. However, in terms of structural factors that increase the relative risk of conflict—namely, a recent history of militarized disputes, a shared border, a lack of democratization in Russia (Bennett and Stam 2004)—the probability of conflict between Russia and Ukraine is likely to continue to remain high for years to come. This is particularly true so long as the fates of disputed territory in Donetsk and Luhansk remain uncertain (perhaps Crimea as well, though its increasing integration as a Russian territory provides a measure of stability, disagreeable as it is).

According to statistics gathered by the Organization for Security and Cooperation in Europe (OSCE), the conflict with Russia has been trending in a positive direction in recent years. As illustrated in Exhibit 23, both ceasefire violations and civilian casualties have notably reduced since a high in 2017, with each declining to roughly one-quarter of 2017 levels by 2020 (OSCE 2021, January 28). What role the COVID-19 pandemic has played in this lull and whether the July 2020 ceasefire agreement will have long-lasting effects remain to be seen.

Exhibit 23: Conflict statistics from the OSCE Special Monitoring Mission to Ukraine



In 2020, half of all civilian injuries and fatalities related to the conflict with Russia were due to mines or unexploded ordnance (OSCE 2021, January 28). If the experiences of the heavily mined regions of Vietnam, Colombia, and Afghanistan are any guide, these explosive remnants of war have the potential to plague Ukraine for decades to come even if the conflict in the east were to stop today.

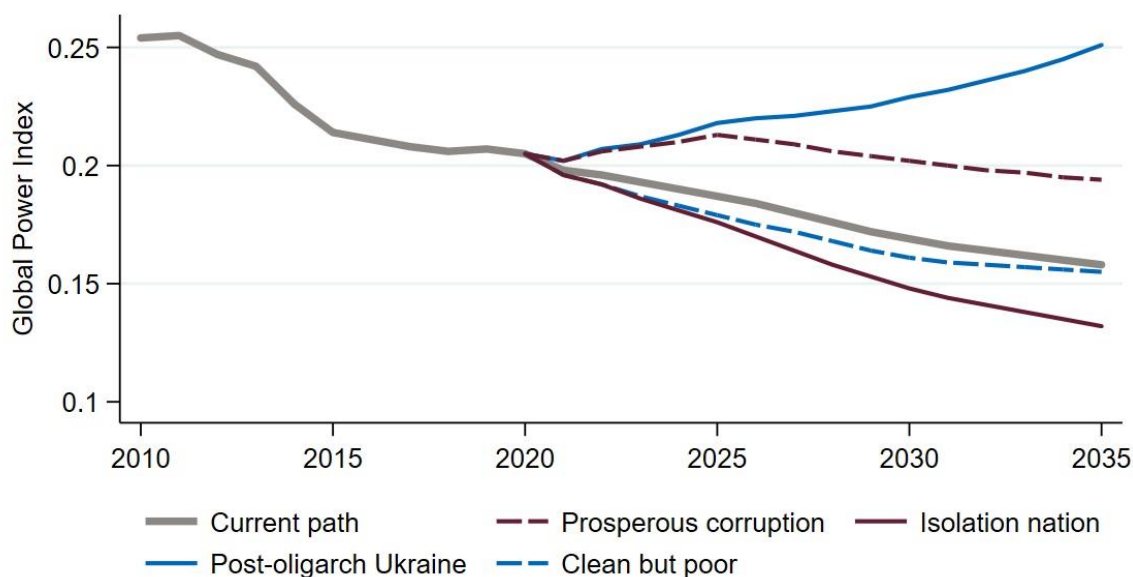
## UKRAINE'S NATIONAL POWER

Somewhat more certain is Ukraine's *Current Path* for its composite material capabilities, also referred to as national power. That said, the country's declining role in the international system is not a foregone conclusion.

One way to measure the decline that Ukraine is forecast to see along its *Current Path* is with the Global Power Index, a composite measure of material capabilities across military, demographic, economic, technological, and diplomatic dimensions that has previously been used in analyses such as the U.S. National Intelligence Council's *Global Trends 2030* report. According to the Global Power Index, Ukraine's power has seen a nearly continuous decline since independence from the Soviet Union. This was at first due to its relinquishment of nuclear weapons (completed by 1996) but is now driven by the factors mentioned above. At present, Ukraine is assessed to possess less than one-fifth of 1 percent of the world's material capabilities (a measure of power), a value that may continue to shrink, albeit at a gradual rate.

However, as the Exhibit 24 below illustrates, if Ukraine can achieve the economic gains and corruption and governance reforms necessary for *Post-oligarch Ukraine* to become reality, it has the potential to reverse its losses in material capabilities that occurred in the wake of Russia's seizure of Crimea—even if the recovery of lost territory is less likely. Conversely, worse than expected trends in economic growth have the potential to accelerate Ukraine's decline in power, as illustrated by the *Clean but poor* and *Isolation nation* scenarios. Should economic growth improve but corruption and governance reform be stymied, our forecasts in the *Prosperous corruption* scenario suggest that Ukraine's current levels of national power will largely remain static through 2035.

Exhibit 24: Forecasts of Ukraine's national power, as measured by the Global Power Index, across alternative scenarios



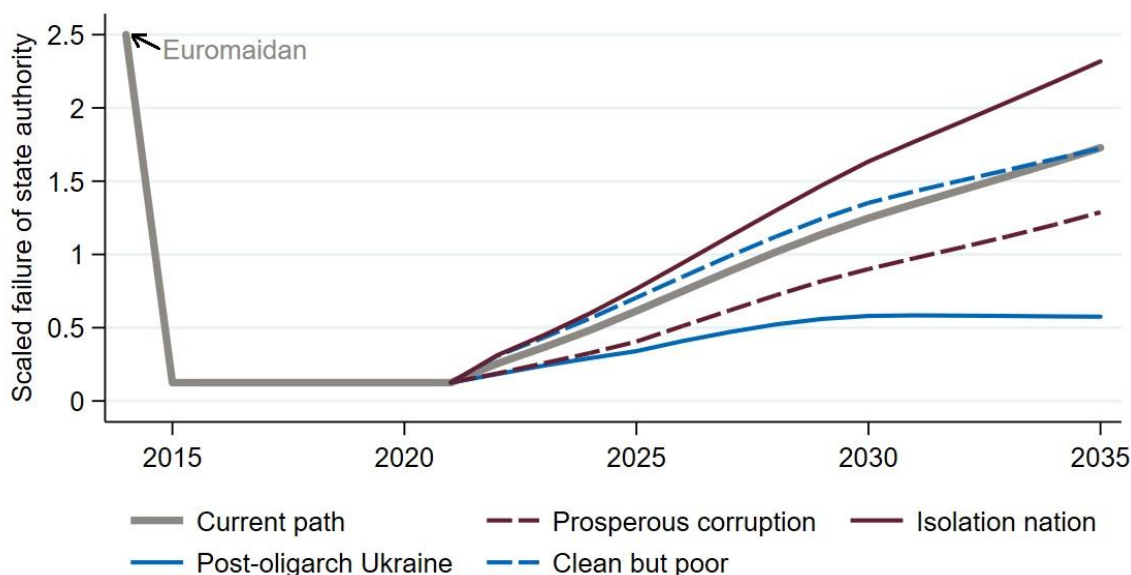
Note: The Global Power Index is scaled from 0 to 100, where values correspond with the percent of global power held by a country

## INTERNAL STABILITY

In using a long-term forecasting model such as IFs, analysts should be careful not to draw any definitive conclusions with regards to the risks of state conflict, whether external or internal. Instead, these risks should be viewed through the lens of structural pressures. As Bello-Schunemann and Moyer describe, “Understanding and measuring structural pressures and the likelihood of conflict is akin to understanding whether a rag will catch fire by measuring the amount of flammable material it contains. Structural pressures measure the quantity of flammable material” (2018, p. 23).

In terms of the structural pressures, all scenarios presented in this analysis suggest that the risk of future internal instability will increase, a *Post-oligarch Ukraine* sees this increase taper off. In the *Isolation nation* scenario, Ukraine’s prospects are least promising, with the forecasted risk of the failure of state authority begins to approach the level of a Euromaidan-like event by 2035. Though far from certain—indeed, Bowlsby and others has highlighted the weakness of models of state instability (2019)—policymakers should understand that the path toward improved governance is unlikely to be an easy one.

Exhibit 25: Forecasts of the risks of the failure of state authority in Ukraine across alternative scenarios



Note: The Political Instability Task Force’s “Scaled failure of state authority” index is scaled from 0 to 4, with 4 equaling state collapse.

Still, the results presented in Exhibit 25 should be taken with a sizeable grain of salt. While the structural drivers of internal instability are projected to increase for Ukraine across all scenarios, analysts should again remember that an increase in pressures does not guarantee that a major instability event will occur. Additionally, it is important to note that IFs does not capture micro-level factors that could help increase internal stability. A primary example is the proposed reform of Ukraine’s Security Service, recently passed by the Verkhovna Rada (Polyakovskaya 2021, January 28). If this reform is enacted into law and thoroughly implemented, the transformation of the Security Service into an organization that focuses only on intelligence and counter-intelligence activities (rather than these and internal state security, similar to the Soviet Union’s KGB) will bring Ukraine more in line with North Atlantic Treaty Organization member countries, which have enjoyed significant normative benefits following their clear separation between policing and intelligence activities.

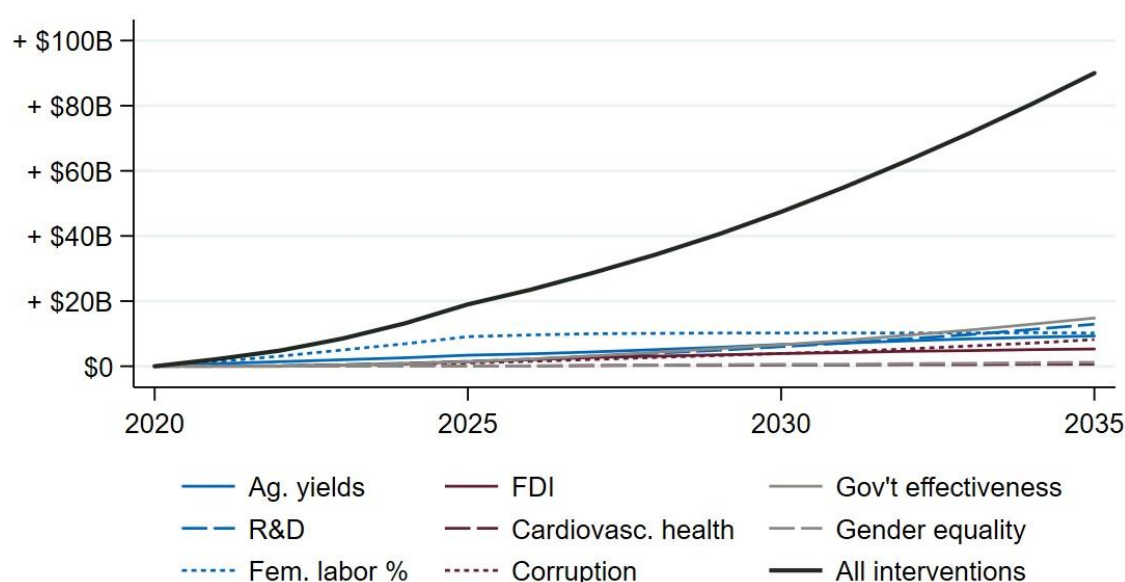


# POLICY IMPLICATIONS

Ultimately, policymakers and analysts should use their own judgment as to how best to interpret and act on the information presented in this report's analysis. Here we highlight key takeaways from the results presented above and clarify more nuanced points, such as the temporal effects of scenario interventions and their synergies. In brief:

- **Strong, long-term growth is plausible for Ukraine's economy, though it will require leveraging the synergies that would develop from successes across several areas, including improved agricultural yields, increased foreign direct investment and R&D spending, and corruption and governance reform.**
  - Economic improvements across any one issue area will of course be positive for growth, but a whole of economy approach would yield significantly improved outcomes. (See Exhibit 26.)
  - Building a truly robust economy will require governance reforms, not just those targeted at purely economic improvements. Likewise, significantly improved governance will require a strong economy.

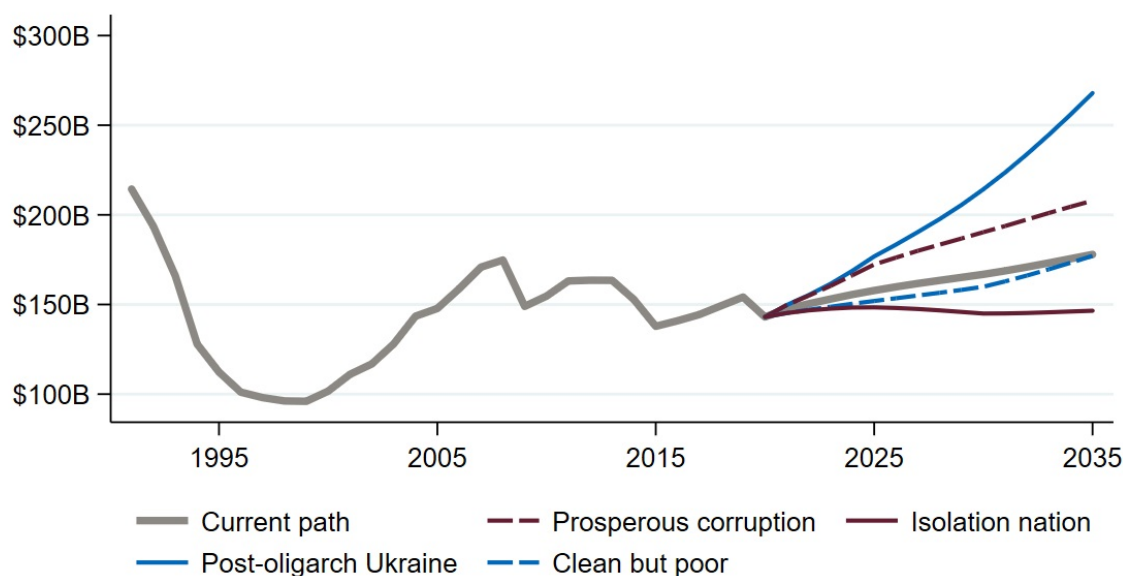
Exhibit 26: Cumulative increase of all positive scenario interventions to Ukraine's GDP relative to the *Current path* compared to the individual effect of each intervention, the sum of which falls well short of the synergistic effects of their combined impacts



- **Government analysts should entertain long-term economic forecasts that are less optimistic than those currently presented in the CMU's draft *Vectors of Development* report (2021).**
  - In the best-case scenario here, Ukraine's GDP is forecast to reach roughly \$246 billion (in constant 2018 values) by 2030. The Cabinet of Ministers of Ukraine's (CMU) recent low-end estimate appears to be equal to roughly \$250 billion by 2030. (See Exhibit 27.)
  - Even if for the sake of a thought experiment, it would be useful for planners to assess their options under less-than-ideal circumstances. This could lead to creative solutions or, at a minimum, highlight government priorities by forcing planners to consider what items on their agenda may need to be cut in the event of austere conditions.

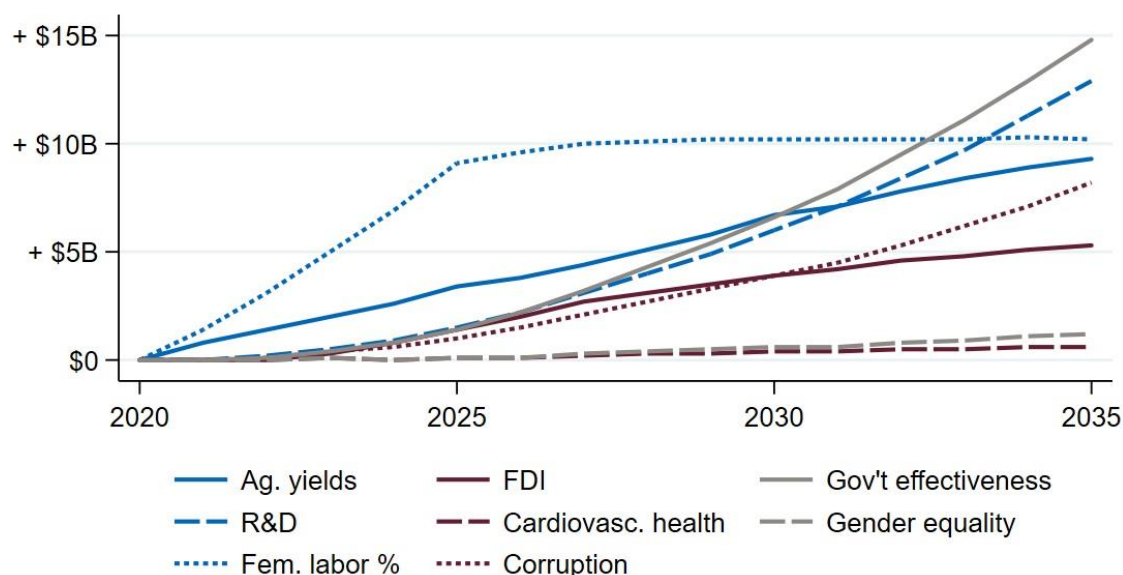


Exhibit 27: Long-term forecasts of GDP at market exchanges in 2011 USD for Ukraine in alternative scenarios compared to the CMU's apparent target for 2030, which exceeds that of the most optimistic scenario presented here



- Individual reforms are forecast to take effect at different rates over time. For corruption-related reforms in particular, at least at the macro-level of analysis presented here, notable benefits for Ukraine's economic growth are expected to take several years before setting in.
  - Increases in female labor participation rates are expected to provide the fastest results among the interventions modeled here (see Exhibit 28), a product of labor being a primary input of economic growth along with capital and multi-factor productivity.
  - Improvements to corruption perceptions and government effectiveness are expected to take five to ten years before notably affecting Ukraine's GDP, though their projected long-term effects are among the most significant of the interventions modeled in this analysis.

Exhibit 28: Temporal effects of each intervention and its increase in Ukraine's GDP, denominated in 2011 USD.



The findings from this analysis will be revisited and updated annually, seeking to reflect the impact of recent developments. Meanwhile, the USAID/Ukraine Monitoring and Learning Support team will engage with the USAID/Ukraine Mission for feedback on how best to support its scenario surveillance needs. In this vein, forthcoming *Scenario Surveillance Analysis* and *Indicators and Warnings* reports should both be read as living documents that are meant to evolve with the Mission and its Development Objective teams' needs, and be updated to reflect changing conditions on the ground.

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# ANNEX I: DATA SOURCES AND INTERVENTIONS IN IFS

The forecasts and scenario analyses for this report were generated using the International Futures (IFs) integrated assessment model. For more on IFs, see the relevant section in the main report, or visit: <https://pardee.du.edu/>. For a complete description of all data series used in the IFs model, see: <https://pardee.du.edu/wiki/Data>. For a tutorial on how to complete a scenario analysis in IFs, see: <https://www.du.edu/ifs/help/use/scenario/>.

## DATA SOURCES

International Futures (IFs) modeling application contains a large historical database that enables model users to explore patterns, understand relationships and estimate parameters. The database consists of a large collection of country level time series tables covering a large number of variables on IFs model issue areas like population, education, health, agriculture, energy, economics, environment, infrastructure, governance and international politics. The database is compiled, in most cases, from publicly available cross-country data series, e.g., World Development Indicators, UNESCO Institute for Education database on education, FAO database on agricultural production, Correlates of War data on conflicts etc. IFs data team add new series to the database and update the existing ones on a regular basis.

As of IFs version 7.59, the model contains 4,799 data series which cover 186 countries over time. Of these, more than 500 primary series are read into the model and used for forecasts. These data come from a variety of sources, particularly large international organizations. Temporal coverage, in most cases, start in 1960. As much as is practically feasible, we try to collect data from the fewest number of sources for the following reasons:

- International organizations compile data from many sources must standardize the results to ensure comparability and quality. By collecting standardized data directly, we avoid some time-consuming data validation processes.
- Time-series data are imperative for long-term forecasting. In our experience, international organizations tend to collect data across time (annually) and commit to frequent updates.
- Third, by limiting the number of data sources, we limit the amount of time and organizational resources required to collect new data every year.

Where historical data are missing or provide contradicting values, a “preprocessor” algorithm reconciles all data necessary for IFs forecasts for all countries for the initial year. This requires “preferencing” particular data series among which must be determined given the data’s credibility and coherence with other observations. Once complete, the model is said to be “initialized” and can begin running its dynamic, recursive forecasts. Unless otherwise specified, forecast values are generated by IFs. A description of the most prominent series used for the analysis in this report are presented below in Annex Table I.

Annex Table I: Primary variables and data sources featured in the IFs-based *Scenario Surveillance Analysis*

Category	Variable(s)	Source(s) for historical data
Agriculture	Agricultural yields	Food and Agriculture Organization of the United Nations
Demographics	Life Expectancy; Population	United Nations Population Division
	Poverty	World Bank World Development Indicators
	Human development index	United Nations Development Programme
Economy	Economic growth	International Monetary Fund World Economic Outlook (October 2020)
	Foreign direct investment (% GDP)	United Nations Conference on Trade and Development; World Bank World Development Indicators
	Government expenditures, revenues, and debt; Household consumption and savings	International Monetary Fund; Organization for Economic Cooperation and Development; World Bank World Development Indicators
	Labor participation	United Nations International Labor Organization
	R&D spending (% GDP)	Organisation for Economic Cooperation and Development; World Bank World Development Indicators
	Trade in goods and services	CEPII-BACI; International Monetary Fund Direction of Trade Statistics
Corruption and Governance	Corruption perceptions	Transparency International Corruption Perceptions Index
	Gender empowerment measure	United Nations Development Programme
	Government effectiveness	World Bank Government Effectiveness Index
	Polity; State failure risk	Center for Systemic Peace
National power	Global power index	Frederick S. Pardee Center for International Futures



# INTERVENTIONS IN INTERNATIONAL FUTURES

Brief paragraph description followed by a table. A scenario is a story or story outline. Thinking about the future normally involves creating alternative scenarios, or stories, about the possible evolution of drivers. Some such scenarios are exploratory and consider the possible unfolding of different futures around key uncertainties, such as the rate of some aspect of technological advance or the fragility of some element in the global environment. Other scenarios are normative and develop stories about preferred futures, such as a global transformation to sustainability.

Scenarios in IFs are built from multiple interventions that collectively help build a coherent story about the future. By interventions we mean adjustments in model parameters that alter the *Current Path* trajectory of a variable or given set of variables that the parameter affects directly or indirectly in the model.

The four scenarios used in this report are based those developed by the Futures Team and USAID’s Global Development Lab to answer the question of what Ukraine’s development trajectory will look through the year 2025. Their four largely qualitative scenarios were built around a two-by-two framework of corruption reform and economic growth outcomes, positing a mixture of positive and negative trends for each, namely:

- 1. *Post-oligarch Ukraine* — lower corruption and improved economic growth.
- 2. *Clean but poor* — lower corruption and poor economic growth.
- 3. *Prosperous corruption* — higher corruption and improved economic growth.
- 4. *Isolation nation* — higher corruption and poor economic growth

— Williams, Gale, and Bobick 2016, p. 4

A depiction of the two-by-two framework is presented below in Annex Exhibit I. This is followed in Annex Tables 2 through 5 by a description of the operationalization of these scenarios in IFs. Each table describes the IFs parameter that was adjusted and relevant one-, five-, ten-, and fifteen-year targets.

Annex Exhibit I: Depiction of the scenario framework developed by the USAID Global Development Lab’s Futures Team



Annex Table 2: IFs interventions for the *Post-oligarch Ukraine* scenario

<b>Parameter (IFs name)</b>	<b>2021 target</b>	<b>2025 target</b>	<b>2030 target</b>	<b>2035 target</b>
Multifactor productivity (mfp)	1% above base case	n/a	n/a	n/a
Agricultural yields (ylm)	n/a	120% of base case	130% of base case	130% of base case
R&D spend. (randdexpm; gdsm)	n/a	200% of base case (i.e., double)	250% of base case	250% of base case
Female labor participation (labparm)	n/a	123.5% of base case (to reach parity w/ males)	120.3% of base case (parity w/ males)	117.5% of base case (parity w/ males)
FDI inflows (xfdiinm)	n/a	200% of base case	250% of base case	250% of base case
Cardiovascular disease mortality (hlmortm)	n/a	90% of base case (reaches WHO “best buys” target)	90% of base case	90% of base case
Corruption perceptions (govcorruptm)	n/a	140% of base case (CPI increase = less corruption)	160% of base case	160% of base case
Government effectiveness (goveffectm)	n/a	140% of base case	160% of base case	160% of base case
Gender empowerment (gemm)	n/a	120% of base case	130% of base case	130% of base case

Note: Interventions start in 2021; “n/a” indicates that the International Futures tool’s endogenous model logic takes over. For all variables except mfp, small interventions occur in 2021; these values are the first year of interpolation toward 2025 & later years’ targets.

Annex Table 3: IFs interventions for the *Isolation nation* scenario

<b>Parameter (IFs name)</b>	<b>2021 target</b>	<b>2025 target</b>	<b>2030 target</b>	<b>2035 target</b>
Multifactor productivity (mfp)	1% below base case	n/a	n/a	n/a
Agricultural yields (ylm)	n/a	95% of base case (keeps yields flat)	90% of base case (keeps yields flat)	85% of base case (keeps yields flat)
R&D spend. (randdexpm; gdsm)	n/a	90% of base case (randdexpm); 80% (gdsm)	90% of base case (rand); 80% (gdsm)	90% of base case (rand); 80% (gdsm)
Female labor participation (labparm)	n/a	87.5% of base case	75% of base case	74.3% of base case (keeps rates flat)
FDI inflows (xfdiinm)	n/a	80% of base case	80% of base case	80% of base case
Cardiovascular disease mortality (hlmortm)	n/a	90% of base case	90% of base case	90% of base case
Corruption perceptions (govcorruptm)	n/a	77.5% of base case (CPI decrease = more corruption)	77% of base case (keeps CPI flat)	76.5% of base case (keeps CPI flat)
Gov't effectiveness (goveffectm)	n/a	80% of base case	81.3% of base case (keeps flat)	82.7% of base case (keeps flat)
Gender empowerment (gemm)	n/a	90% of base case	90% of base case	90% of base case

Note: Interventions start in 2021; “n/a” indicates that the International Futures tool’s endogenous model logic takes over. For all variables except mfp, small interventions occur in 2021; these values are the first year of interpolation toward 2025 & later years’ targets.

Annex Table 4: IFs interventions for the *Prosperous corruption* scenario

<b>Parameter (IFs name)</b>	<b>2021 target</b>	<b>2025 target</b>	<b>2030 target</b>	<b>2035 target</b>
Multifactor productivity (mfp)	1% above base case	n/a	n/a	n/a
Agricultural yields (ylm)	n/a	120% of base case	130% of base case	130% of base case
R&D spend. (randdexpm; gdsm)	n/a	200% of base case (i.e., double)	250% of base case	250% of base case
Female labor participation (labparm)	n/a	123.5% of base case (to reach parity w/ males)	120.3% of base case (parity w/ males)	117.5% of base case (parity w/ males)
FDI inflows (xfdiinm)	n/a	200% of base case	250% of base case	250% of base case
Cardiovascular disease mortality (hlmortm)	n/a	90% of base case (reaches WHO “best buys” target)	90% of base case	90% of base case
Corruption perceptions (govcorruptm)	n/a	77.5% of base case (CPI decrease = more corruption)	77% of base case (keeps CPI flat)	76.5% of base case (keeps CPI flat)
Government effectiveness (goveffectm)	n/a	80% of base case	81.3% of base case (keeps flat)	82.7% of base case (keeps flat)
Gender empowerment (gemm)	n/a	90% of base case	90% of base case	90% of base case

Note: Interventions start in 2021; “n/a” indicates that the International Futures tool’s endogenous model logic takes over. For all variables except mfp, small interventions occur in 2021; these values are the first year of interpolation toward 2025 & later years’ targets.

Annex Table 5: IFs interventions for the *Clean but poor* scenario

Parameter (IFs name)	2021 target	2025 target	2030 target	2035 target
Multifactor productivity (mfp)	1% below base case	n/a	n/a	n/a
Agricultural yields (ylm)	n/a	95% of base case (keeps yields flat)	90% of base case (keeps yields flat)	85% of base case (keeps yields flat)
R&D spend. (randdexpm; gdsm)	n/a	90% of base case (randdexpm); 80% (gdsm)	90% of base case (rand); 80% (gdsm)	90% of base case (rand); 80% (gdsm)
Female labor participation (labparm)	n/a	87.5% of base case	75% of base case	74.3% of base case (keeps rates flat)
FDI inflows (xfdiinm)	n/a	80% of base case	80% of base case	80% of base case
Cardiovascular disease mortality (hlmortm)	n/a	90% of base case	90% of base case	90% of base case
Corruption perceptions (govcorruptm)	n/a	140% of base case (CPI increase = less corruption)	160% of base case	160% of base case
Gov't effectiveness (goveffectm)	n/a	140% of base case	160% of base case	160% of base case
Gender empowerment (gemm)	n/a	120% of base case	130% of base case	130% of base case

Note: Interventions start in 2021; “n/a” indicates that the International Futures tool’s endogenous model logic takes over. For all variables except mfp, small interventions occur in 2021; these values are the first year of interpolation toward 2025 & later years’ targets.

# ANNEX 2: QUALITATIVE SCENARIOS FROM THE FUTURES TEAM AT USAID'S GLOBAL DEVELOPMENT LAB

In 2016, the Futures Team of the Global Development Lab at USAID completed a literature review and workshop meant to support USAID/Ukraine's refinement of its CDCS. Their "in-country participatory scenario-planning workshop, held at the U.S. Embassy in Kyiv, Ukraine, on September 28, 2016, [involved] about 25 participants from USAID/Ukraine, local [non-governmental organizations], and civil society organizations" (Williams, Gale, and Bobick 2016, p. 3). Based on these efforts, and follow-on analysis by the Futures Team, four scenarios were developed to answer the question of what Ukraine's development trajectory may look through the year 2025. Synopses for the Futures Team's four scenarios, which were built around a two-by-two framework of corruption reform and economic growth outcomes, are provided below.

The International Futures (IFs) tool's scenarios in this analysis are built upon those developed by the Futures Team but are by no means identical. Rather, they are a best approximation, where differences may exist to adapt our analysis to the IFs modeling framework. Note that the scenario numbers below are those assigned by the Futures Team and not the ordering used to present the analysis in this report.

## SCENARIO 1: POST-OLIGARCH UKRAINE

"This is a world in which sustained pressure from the public, civil society organizations, and external donors leads to significant and meaningful reductions in Ukraine's endemic corruption. Alongside governance reforms, economic reforms also beginning to take root, slowing the momentum of the out-migration and brain drain that have long threatened Ukraine's prosperity. Together, these factors have spurred growth in small- and medium-sized enterprises as well as higher levels of foreign direct investment (FDI), providing a positive outlook for Ukraine's future. In building this scenario, participants emphasized the need for internally-driven reforms rather than expecting that the EU, IMF, or others will singlehandedly solve Ukraine's problems" (Williams, Gale, and Bobick 2016, p. 11).

## SCENARIO 2: CLEAN BUT POOR

"This is a world in which Ukrainian civil society manages to put forward a number of reforms that are largely aimed at curbing corruption, but continued tensions with Russia and a distracted international community prevent them from being coherently implemented and coupled with economic growth initiatives. As a result, Ukraine continues to muddle along in economic stagnation, even though corruption nominally decreases (due to intentional and unintentional factors). This in turn leads to Ukraine facing many of the same problems in 2025 as it does today, including out-migration, brain drain, and environmental degradation, though some bright spots in entrepreneurship and local-level activism may appear" (Williams, Gale, and Bobick 2016, p. 13).

## SCENARIO 3: PROSPEROUS CORRUPTION

“This is a world in which Ukraine’s corruption proves to be mostly intractable for the foreseeable future, in spite of the best efforts of local and international actors: entrenched oligarchs successfully parry anticorruption initiatives, civil society organizations are subsumed into the system and declawed, and the governance landscape shows no sign of improving. Although this naturally prevents Ukraine from expanding traditional trade with many countries, new agreements are forged with partners willing to turn a blind eye to Ukraine’s endemic corruption, potentially even reinforcing it. As a result, Ukraine’s economic growth appears impressive on paper, though the spoils of this growth continue to primarily benefit the elites. Workshop participants found it particularly challenging to draw out a scenario where corruption reigns but economic growth is nonetheless stronger, and in the end they found some compelling possibilities” (Williams, Gale, and Bobick 2016, p. 15).

## SCENARIO 4: ISOLATION NATION

“This is a world in which Ukraine’s governance and economic situation continues to deteriorate despite the best efforts of domestic and international actors. Out migration skyrockets as anyone with the means to emigrate leaves the country, and those who remain find themselves increasingly despondent about the diminishing prospects for an open, democratic, and Western-allied Ukraine. Emerging far-right nationalist movements rally on this hope, while Russia-aligned parties call for a return to ‘the old days,’ forging a truce and new ties with their neighbor to the East. Widespread despair and polarization set the stage for a potential ‘Third Maidan’-like event, even more so than in Scenario #3, the ‘Prosperous Corruption’ scenario” (Williams, Gale, and Bobick 2016, p. 17).