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WHAT WILL IT TAKE TO MOVE BEYOND GDP?

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P R O C E E D I N G S

MR. KHARAS: Good afternoon, everyone. My name is Homi Kharas. I'm the Director of the Global Economy and Development Program here at Brookings.

So, it's my real pleasure this afternoon to introduce our discussion on “Beyond GDP.” I think we all know that GDP has many flaws as a metric of welfare, but I think we should also bear in mind that it has been the workhorse of measure of how economies are doing ever since it was introduced by Simon Kuznets in 1937. So, this is a metric that has a pedigree of well over 80 years, and is not something to be discarded lightly.

So, there are lots of reasons I think to move beyond GDP, GDP doesn't measure a number of the things that we care about. We care a lot about environmental externalities for example, we care a lot about the unpaid work that many women, in particular, do across the globe. One of my colleagues at Brookings, Carol Graham, has written a lot about non-material aspects of welfare including hope and optimism, and other indicators of happiness. None of these are measured in the form of GDP.

So, it's clearly not something that is a full measure of individual well-being and prosperity. And I think that also, we should recognize that GDP and GDP growth tends to be quite volatile. When we look at the experience across countries growth rates over a decade are not very well correlated with growth rates over the next decade. So, you know, countries that do reasonably well don't necessarily do well in the in the following decade.

And so I think that there has long been a quest for some kind of alternative measure that would give us a sense of what one might call sustainable growth, rather than just actual growth of the moment. And that I think is really going to be the focus of our discussion this afternoon.

So, what we are going to do is, we are going to have a short PowerPoint by Glenn-Marie Lange and Quentin Wodon, both are Economists at The World Bank, who have just co-edited a volume called, “The Changing Wealth of Nations 2018.” It's the second, I believe, in what will be a series over time, extremely comprehensive, covering 141 countries over 20 years.

So, this is a volume with a wealth of information in it. And it's, I believe, available outside if any of you would like to look at it in more detail, it's also available online.

And after that presentation, we will move into a panel discussion. The panel discussion will be moderated by David Pilling; he's the Africa Editor of *The Financial Times*, and himself, the author of *The Growth Delusion*: *Wealth Poverty and Well-Being of Nations*, also available outside, so I hope that you go away from this afternoon with lots of good reading material to help you understand these issues a little bit better.

So we've got a really wonderful panel. We have Kristalina Georgieva; she is the CEO of The World Bank. She's a Former Commissioner of the European Union for International Cooperation and Humanitarian Aid, a Former Vice President of the European Commission, a Former Co-Chair of the U.N. Secretary-General's High-Level Panel on Humanitarian Financing. Kristalina, it's a wonderful pleasure to have you here.

We have Professor Dale Jorgenson, the Samuel W. Morris Professor at Harvard. His extraordinary career spans, you know, many aspects of econometrics and growth theory. And I am particularly privileged to introduce him because he taught me econometrics as a graduate student some 41 years ago. (Laughter)

And Dale, I'd like to thank you on behalf of all of your students over the years, before you think that that's a, you know, a compliment, just to look at some of the errors I've made in some papers that I've submitted for publication.

Andrew Steer is the President and CEO of the World Resources Institute, WRI, has just been named one of the outstanding think tanks on environment and sustainability issues in the Think Tank Rankings that have just come out. Congratulations on that, Andrew.

And then finally, we have our own Danny Kaufmann. I like to introduce Danny as a Non-Resident Senior Fellow in our Global Program; unfortunately, he also has a day job which is to be the CEO of the Natural Resources Governance Institute, which is a major player in the push for transparency around the utilization of natural resources in the world.

So, I look forward to a wonderful panel. The event is being webcast. We encourage you to use the hashtag *BeyondGDP* when tweeting, and as some of you have already found, there are some sandwiches and refreshments outside, to my left over here, and after the event please feel free to have some.

With that let me ask Quentin and Glenn-Marie to start with their presentation.

MS. LANGE: I'd like to thank you all for coming here today. We are really excited to have this opportunity to tell you about our new report: *The changing Wealth of Nations 2018, Building a Sustainable Future*. This is the latest in the series of reports The World Bank has done on wealth accounting. So, let me start by explaining why The World Bank thinks it's important to measure wealth.

Some years back Joseph Stiglitz, Nobel Laureate, and our Former Chief Economist, commented that private companies are always assessed on the basis of both their income statement and their balance sheet, their net wealth. That's because a company can always increase its current income by selling off assets, but this is a short-term strategy that would undermine the long-term financial viability of any company.

He noted, however, that countries, on the other hand, only report on their national income or GDP, and we know nothing about the assets that underpin and produce GDP. If we want to continue to maintain GDP in the future, we must maintain the assets that produce it. GDP measures current national income, wealth measures the prospects for generating that income into the future.

These two indicators are complementary, and both are needed to measure the economic health of a national economy and sustainability. It's for this reason a better measure of sustainability that The World Bank thinks it's important to measure wealth.

In the early 2000s, The World Bank launched an initiative to fill the information gap about national wealth. Our latest report, as Homi mentioned, estimates the wealth for 141 countries over 20 years. We define wealth measured in market prices very broadly to be comprehensive.

It includes produced capital, the infrastructure, buildings, machinery and equipment that we are all pretty much familiar with, it includes natural capital, minerals and energy resources, agricultural and forest land, protected areas. We are still missing some important components of natural capital, like water, renewable energy resources, of fisheries and others. The book discusses how we might move forward to fill this gap in future work.

For the very first time we are able to measure human capital explicitly, and this is one of the major innovations of this report on the wealth of nations, and of course we also include net foreign assets, a relatively small but critical component of wealth. Viewed from the lens of wealth development is about building and managing a diverse portfolio of assets.

With this introduction let me turn to some of our global results. My colleague, Quentin Wodon, will then come and discuss some of the detailed results for natural capital and human capital.

So global wealth grew by 66 percent between 1995 and 2014; the most striking feature was an increase in the share of global wealth held by the middle-income countries, in the light blue and orange there. They increased their share from 19 to 28 percent of global wealth by 2014. Of course, much of this was due to rapid growth in Asia, especially the large economies of India and China, but also smaller countries like Vietnam and Bangladesh. The share of global wealth held by Sub-Saharan African countries, on the other hand, remained unchanged.

But we don't want to look just at how total wealth change, we need to look at how wealth per capita changed. That's because the amount of wealth per person determines the GDP per person that a country can produce.

The low-income countries all the way on the left, many in Africa nearly doubled their wealth, shown in the light blue bar, increasing wealth at a faster rate than the global average of 66 percent. But higher population growth in these low-income countries means that per capita wealth, the dark blue bar, grew only 17 percent far below the global average of roughly 30 percent.

Despite the growth of global wealth great disparities remain. Here is the average wealth per capita across the different income groups. We see that high-income OECD countries like Canada, the U.S., Australia, Great Britain, and so on, still hold far more wealth per person than the others, at roughly $700,000 per person on average, this was 52 times the wealth in low-income countries which averaged just under $14,000 per person.

These income group averages had a great deal of variation among countries within each of these groups. Total wealth grew everywhere but per capita wealth did not. Let's consider the ones that grew the fastest, those in green, that's where per capita wealth increased at least 100 percent over these 20 years.

These include countries like China and India, Vietnam, Bangladesh, Sri Lanka, some countries in Latin America, like Peru and Chile, and some others, Africa shows a great mix of experience with some fairly high performers, like Rwanda and Ethiopia, and others where wealth per capita actually declined.

What we found was per capita wealth stagnated, meaning somewhere around zero up to 5 percent per person, or declined in 25 countries for a variety of reasons, and you can see them highlighted in pink and orange here.

Most of these countries were fragile, conflict states with high population growth. Countries like Zimbabwe, Madagascar, Lebanon or Papua New Guinea. The 2009 financial crisis even hit some of the high-income OECD countries like Greece and Spain, which are now expected to be recovering.

With this brief overview let me now hand over to my colleague, Quentin, to talk a little bit in more detail about the natural capital and human capital.

MR. WODON: So, Glenn-Marie went through some of the key findings of the report in terms of the broad trends in wealth and in per capita wealth by income groups or by regions. The second part of this brief presentation is about giving you a bit more of a flavor for some of the results related to natural capital and human capital especially.

So this first slide gives you the share of total wealth of the main three types of capital, produced capital, natural capital and human capital. And what you can see is that for produced capital, with the exceptions of low-income countries where the share is lower, there's not that much of a change depending on the development level of the countries; produced capital accounts for about one-fourth of the total.

But you see a major shift between natural capital and human capital. So, natural capital remains the largest component of wealth at 47 percent of the total in low-income countries, but then it shrinks as a share of wealth to 3 percent in high-income OECD countries. And by contrast, human capital increases over time.

So, if you think about two countries. Think, for example, about the Democratic Republic of Congo, that Glenn-Marie mentioned, you realize there's a lot of wealth that is represented by a natural capital, whether it's minerals, whether it's forests, whether it's agricultural land, and you think about Switzerland, if you don't account for ski slopes, there's actually very little natural capital, it's less than 1 percent of the total.

So, let's look a little bit more in details at trends as countries develop in natural capital. So what you have on this slide is, in blue, the share of total wealth, what I just presented before, of natural capital that declines as countries reach higher levels of economic development.

But what you have in orange is the actual level of natural capital per person per capita. And this is an important point, in absolute value natural capital is actually higher in high-income OECD countries than it is in low-income countries, about three times higher.

And so the message that we want to give here is that we are not talking about liquidating natural capital for other investments, we actually have to invest as well in natural capital, including in renewables.

Now, this slide shows you some of the main components of natural capital, in per capita values for the world as a whole over time, from '95 to 2014. And what you see is that the absolute value per person of natural capital has increased. And the area that you see that has increased the most, in gray, actually represents fossil fuels.

Now, this takes into account both the reserves, the proven reserves that countries have as well as prices, and it's important to note that in the 20 years represented by this graph oil prices, for example, tripled.

But even the value of minerals has increased, and importantly the value of agricultural land, which is in orange in the slide, also increased, both, because the area's being cultivated increased, and because the value per hectare of the land increased as well.

What also emerges from this graph, and that's sometimes not realized, is that among all sources of natural capital the renewable sources actually represent a larger share of the total than the non-renewable, which points again, it's to the importance of managing those resources well.

Now, in the same way that the previous slide, two slides ago, represented the trend as a share of natural capital, and the levels in absolute value of natural capital across income groups, this shows you the same picture for human capital.

And as I mentioned it, human capital as a share increases, it accounts for about 70 percent of total wealth in high-income OECD countries, but what is really striking is the gap between low-income countries and high-income countries in the values. What you have is that human capital is about 90 times higher in high-income countries versus low-income countries.

And maybe I should just say: how do we measure this? Human capital is computed as the value today of the future earnings from the labor force, and the two main authors or innovators, are Dale Jorgenson and Barbara Fraumeni, who are both here; what we did is apply their methodology to 141 countries, but the idea of measuring human capital as the discounted value of future earnings from the labor force comes from them.

Now, this graph makes it clear that as countries develop you really have to invest for your competitivity, for the ability of generating future income in human capital. And I just want to mention a few of the topics that we are working now on, using those data.

So, one aspect of those data is that they can be used for cost-benefit analysis, we can, for example, look at how would a reduction in child malnutrition change human capital wealth for countries; what's the value of that? Or, we can look at how much would human capital increase if you were providing better education for girls? So all of this is feasible, and made easier through those data as examples of applications.

Now, one of the applications that is in the book, and on which we are doing more work as well, is about gender. What we find is that women account for less than 40 percent of global earnings, and that essentially means human capital, the total value of future earnings for the labor force.

But then, if women were earning as much as men this would mean that human capital wealth would increase, and what that graph shows is that that increase would be especially high in South Asia, it would also be larger in low-income -- low- and middle-income countries than is the case for richer countries.

Now, to summarize, so what have we learned from this whole exercise? So, first, and that's good news, global wealth increased by about two-thirds over the 20-year period that we looked at. And as Glenn-Marie mentioned it, the upper middle-income countries actually are slowly catching up with high-income countries, and they account now for a much larger share of total wealth.

Per capita wealth increased as well globally, but by one-third only, and the difference is population growth. And as Glenn-Marie mentioned, the impact of population growth varies depending on which countries you look at.

Human capital is the biggest components of wealth, natural capital is still extremely important of course, especially, again, in low-income countries, and the rents, the earnings from natural capital have to be invested properly to drive future growth, especially in those countries.

And the broader message that we want to give you, or we hope that these data will be used by many of you, is that the composition of wealth is important, and that countries need to manage that composition of wealth, the different assets they have, the portfolio of assets, for long-term sustainable growth. Thank you. (Applause)

MR. PILLING: Thank you very much for that opening presentation, for what I thought were excellent graphics as well. I'd also like to welcome our online audience, and of course everybody who is in the room today.

As we've heard, you know, ever since GDP's conception and invention in the 1930s, its inventor, Simon Kuznets, had doubts about the measure that he unleashed on the world, and yet it's been very enduring, and enduring for many good reasons. It's very concrete; it tells us something that that you can make policy around.

Given that, Kristalina, why has The World Bank become so involved, and put really so much capital, if I could use that word, political capital, and behind, you know, looking for alternatives? And looking for -- and we should be clear what this alternative is -- really the balance sheet that is the complement to the flow measure, the income and production measure that is GDP?

MS. GEORGIEVA: First, many thanks to Brookings for bringing us here. I think the presentation gave a very clear answer. We know more about the capacity of countries to meet their development objectives when we complement GDP with understanding the asset underpinning for producing this GDP.

MR. PILLING: Yes.

MS. GEORGIEVA: It is like a return on what you have. If I can just go back in history, I had this incredible privilege to have been there when this work was put on tracks, and I don't see in the audience, Kirk Hamilton, one of the original authors of this report, but I very clearly remember the discussions we had on *Beyond GDP*, and the necessity to give decision-makers a clear understanding on what they have, and how they can turn it into prosperity for the future.

The most important element of this report is that it is policy informative. In other words, if you look at the world as a whole, or you look at a particular country, knowing the compositions of assets is very clearly able to inform your decisions, your policy decisions.

For example, if you are rich of non-renewable natural capital, you can extract it but you have to invest the rent you get from this extraction into education and health, or physical capital, or renewable natural capital, so you can sustain your progress. And if you carefully assess how countries are performing, it is so very obvious that there are some pressing policy issues to be addressed.

For example, population growth; so many countries today have population growth that way exceeds what they can sustain and still get better off in the future. And yet we all have to admit that our collective attention to policies that bring a more sustainable population growth has been a bit underwhelming. We know what they are, get boys and girls in school, keep them there, make sure that there is family planning, that health services are accessible to women, I could go on.

And yet it has not been such a strong focus of policy, and yet if you go back to what the graph has shown, it is so clear that we are -- we have a set of countries where people are getting either not better off, or they are getting worse off, and because we are not aggressively addressing that.

So, from the perspective of The World Bank, yes, it feels good to have this report. It is actually the third we have issued. It is a great report, but much more importantly, it helps us in informing policies we engage countries we work with for the well-being of their people.

MR. PILLING: Thank you. I mean to be clear some countries could be producing what look like very good GDP results, a very fast GDP, but their wealth might be declining, particularly in per capita terms.

MS. GEORGIEVA: Could I just quote you? You had this great story of the two men that illustrates how GDP is misleading. If people haven't read the story, please do, and I'm sure reading this book will help you through.

MR. PILLING: Thank you.

MS. GEORGIEVA: It basically says that if you only take GDP it is kind of driving with only a semi-good outlook on the road ahead. And you shouldn't do that. It is absolutely paramount that this notion of complementing GDP with wealth analysis is adopted by the research community and by the policy community.

MR. PILLING: Thank you. Let me turn to Dale Jorgenson, on and because one of the most interesting aspects of this report is the new methods of calculating human capital, human capital in previous World Bank reports was really a residual, it was just what was left over. We knew it must be there, but we didn't really know how to measure it. This report goes one stage further and actually puts a number on human capital, and finds that human capital is what, 70 percent of the wealth in the in all countries. Is that right? In all countries, yes?

MR. JORGENSON: Yes, that's right.

MR. PILLING: Could you tell us a little bit, without too much detail, but just a little bit about the methodology. How are we actually calculating the human capital?

MR. JORGENSON: Well, the key idea, and I think it's very important to underline this before we launch into the specifics, is the idea that this really transforms the nature of the calculations of wealth that The World Bank has been doing, as we just heard, for more than a decade. And of course this goes back to work on sustainability in The World Bank and elsewhere.

But the key thing in the innovation that David just described, is the idea that human capital should be measured with the information that is specific to the countries, and the regions, and the world economy, that are to be captured by this very, very important measure.

The idea of using lifetime labor income is intuitive. It turns out that that is the idea of wealth in the form of the labor resources that people bring to the economy, into the world markets every day. But what we found as a result of this pioneering research is that this turns out to be the most important element of sustainability. It's 70 percent of the value of wealth for large countries like the OECD as we saw; it's by far the largest component. So, in order to deal with the issue of sustainability we must deal with the issue of measuring human capital.

So as a result of this exploration, in The World Bank and elsewhere, people begin to look around to different measures of human capital, and there are many, many of them, and ask the question: which measure will fit best into The World Bank framework for dealing with the issues related to sustainability?

And it soon arrived as a conclusion that the key idea was to take data for individual countries that measures income over the whole lifetime of each member of the labor force, and treat that as the value of human capital. It's only then that you bring out the details.

How much detail did this study provide? The study includes specific measures of human capital for a 141 countries, and this is based on a resource that The World Bank itself brought to the research bench, so to speak, through its work on poverty and inequality, in what is called the International Database for Income Distribution. This is something that had been used, primarily, by The World Bank for measuring poverty and inequality.

The key leap that is the foundation for this innovation is the idea of bringing that to bear on sustainability through the idea of human capital, so these three ideas came together: sustainability, human capital, and the dataset for individual countries that provided a lifetime income.

So, this is a major contribution to economic measurement. It's something that's going to resonate through the field of economic development, through the field of economic growth.

And I'd like to congratulate Quentin, and Glenn-Marie, and their co-authors, on putting together a magnificent study with many important new ideas that are going to be fruitful sources of research ideas for decades. Congratulations!

MR. PILLING: I think it's important to note that embedded within that though, those numbers for lifetime earnings, are of course health, skills --

MR. JORGENSON: Education.

MR. PILLING: -- education that underpins because, of course, that will determine, critically, the lifetime earnings of people, what they bring as you say.

MR. JORGENSON: Exactly.

MR. PILLING: And so this is not just a calculation of wages, there's a lot that's implicit within that. I mean, I want to move on to natural capital in a second, but could I just ask you, very briefly, was there anything that leapt out at you looking at those numbers in 141 countries?

MR. JORGENSON: I'm sorry?

MR. PILLING: What leapt out at you? You saw --

MR. JORGENSON: What leapt out at me was the fact that this is the driving force in sustainability, it's the number that you have to make precise in order to use the ideas that originally motivated the study that we just heard about. Namely, The World Bank's objective of trying to understand this concept of what makes sustainable growth; how do we deal with of the race, if you like, between the increase in population and the increase in wealth? The key idea turns out to be this idea of human wealth. And so, that is essentially the lesson that leaps out at me.

MR. PILLING: Thank you. Andrew, if I could bring you in now, and if you could talk about natural capital, because one of the things that comes out of this report is natural capital plays a huge role in poor countries, but then as they become wealthier, and hopefully use that natural capital well, they build up other forms of capital, and then natural capital diminishes in proportional terms, but absolutely not in absolute terms, because if you ruin your natural capital you don't have anything left for the future wealth.

First of all, how robust do you think these numbers are? And do you wish that other forms of natural capital, renewable natural capital, were also included here in these numbers?

MR. STEER: Yes, I do. But first, look, congratulations, Glenn-Marie; Kristalina, that fact you as the CEO are sitting up here and talking about this, this is a great blessing, and well done to The World Bank. I had the privilege of being the Director of Environment of The World Bank about 15 years ago, so did Kristalina, actually. I remember when we set up this little unit called The True Wealth of Nations Unit.

MS. GEORGIEVA: Yes.

MR. STEER: With John Dixon, and Kirk Hamilton, and people like that. And my goodness, you've come a long way. And well done. And I particularly like the fact that you also make, for example, the point that it's not just about running down your capital, that's natural, and building it up in education. Although that is a very good thing to do, you actually can invest in your natural capital, and actually natural capital in rich country is actually worth more than it is in low-income countries.

But yeah, look this is a journey we are on, and I might come out in a slightly different place, in the sense of, I would have liked some of the non-marketed natural capitals to be included. So, for example, what we do here in this book and it's very legitimate, because you have to have data for 190-some countries, and therefore if you don't have all the data you can't really include it.

But take, for example, a mangrove, the way we measure it here is the value of the mangrove is the forest products you could get out of it, and that's about $800 for a hectare. But actually if you look at the ecosystem values it's $36,000, you know, and that's because it protects against flooding, but it also is the home of fish being born, and all kinds of things like that.

So, I think that I mean -- and I think the book is very honest, it has a chapter 11, which is terrific. Start with the last chapter (laughter), because that is actually what is -- what's the next report is going to have to do.

But there are some interesting things here if you think about it, I mean take for example fossil fuels, they are in the ground. Now this report legitimately says, okay, we've got to measure them. So, if you're Saudi Arabia it's what's under the ground. Well, yes, and then imagine you could keep selling it. Well, yeah, but what about the sunshine that we have today? I mean a coal under the ground or oil under the ground is simply bottled sunshine, it just happened to come here from four million years ago, but actually the sunshine coming today.

It's not easy to measure the solar potential you have today, and that is actually even more valuable than what's under the ground. And so the next edition needs to sort of look at that as well. A and I think the fact that it doesn't is perfectly legitimate for this time around, but we do need to move towards that.

There's another issue with fossil fuels of course which is, you know, are we actually going to be able to sell them all, and probably no, because if we are going to deal with climate change, actually we'll have to keep half of it under the ground. So, should we be assuming you can keep selling it?

So, look! This is a journey. Just one final thing, it sounds like I'm grumbling, but I love this book by the way, it's a fine book. How do we measure the value of capital here? It's by assuming that you can market something and then you discount it back to the present, and so you use a discount rate of 4 percent, which sounds reasonable except that $100 a hundred years from now is worth $2 today, if you discounted it at 4 percent.

It doesn't really give the sense that you really care about sustainability, does it? Now, Nick Stern in the Stern Report says instead of having 4 percent let's have 1.4 percent, that way $100 would be worth $25 today if you discounted it back.

At least it's -- so I would recommend two things for the next edition, one to do some sensitivity, to say, look, this is whatever, but let's assume a lower discount rate as well. And there's a very legitimate disagreements here by the way. And the second thing, I'd take chapter 11, which is a fabulous chapter, and I'd say: imagine we could measure these, and we've got sort of rough, back of the envelope here: what would it do?

Because, you see, the only problem is, if you say that natural capital to rich countries is only 3 percent of their wealth, why bother; because in fact, they need clean air, clean water, and ecosystems just as much as anybody else.

MR. PILLING: So, I don't want to start a battle of the capitals, but do you think that natural capital is, in a sense, underrepresented in the numbers?

MR. STEER: Oh, I think the reports are very honest, it is, I mean, yeah, it's very honest.

MR. PILLING: Yes? Okay. We got that.

MR. STEER: It is seriously underestimated, yes.

MR. PILLING: Okay, Danny, if I could now bring you in. As I was saying before human capital used to be a kind of a residual in these numbers, but there was more in there than just human capital. There was what you might call institutional capital, and a part of that structure, that you probably know, at Cambridge, tells the story of two islands, they both have exactly the same wealth, and they start off at exactly the same place. But one has absolute trust, and one has no trust at all, and very soon the island with more trust begins to exceed the island with no trust, because it could trade, and specialize, and all of that.

And that is, in a sense, a kind of shorthand for institutions. So, is institutional capital, does it exist in this report or has it been squeezed out? Should we try to measure that, or is it somehow in between there?

MR. KAUFMANN: First, I echo what everybody said. Congratulations to the World Bank. Let me perhaps summarizing what was said. I think this is potentially transformative, and I'll discuss and build on what was said very quickly, on both, potentially on transformative.

First, I think it's really important and that's a great contribution of your book, David --

MR. PILLING: Thank you.

MR. KAUFMANN: -- to make a clear distinction between flows and stocks, and the importance, just like at a personal level, in my organization we have to manage a balance sheet as well as an income statement. So, that's absolutely clear, and The World Bank has been working on this for a decade, and this is another leap forward in this context, really important.

At the same, time the real contributions which are a bit buried in the report that I will think that it's important for everybody to look at, which is also about the flows. So, how to complement GDP and go forward? The net savings measure is not a stock measure which is very important, very important for our work regarding natural resources.

Now, potentially transformative, my own country Chile, Chile, very rich subsoil resources, particularly copper, forever didn't develop too much until some decades ago when they put all the institutions, and everything in place, major transformation is in very dark green there. Of course I'm biased, I'm from there, but just compare with Equatorial Guinea, and so many other countries that have not done well in transforming the natural wealth, in transforming the natural resources into human capital, which is absolutely crucial, productive capital, and then GDP.

So, we need to think about that transformation. It's in a sense a value chain. Now, what's not in slide two, which is a key one showing the value chain, is governance and institutions, which is absolutely a crucial mediating factor to convert, to transform first from the natural capital to the next stage, which is human capital, productive capital, GDP and ultimately well-being. Great slide but that should be center front.

Of course, we all know that it's incredibly difficult, so it's not just trust. I mean rule of law, what about rule of law? What about corruption? What about freedom of the press, civic space? All those things that we know now, and we have measured the extent to that matters, for not only income per capita in the long term, which we have done with my colleague at The World Bank, Aart Kray, and with all the worldwide governance indicators, a major three-to-one ratio in terms of per-capita income at a higher governance level.

So, that's missing but not totally, because it is, to some extent, embedded in the calculations of the future flows, and net present value at market prices. The problem is that it's not sufficiently differentiated by the quality of those institutions, the quality of governance today, and also discussing, as Andrew said, for environment different scenarios.

We just produce another report which could be very useful in this context, which measures the quality of governance, accountability and transparency for the resource-relevant countries, and rate them. I would submit that it's really important to integrate, as an addition to the discount rate, which could be 4 or 1.5 percent depending, but the governance factor, because if we would have done this exercise 10, 20 years ago; the Venezuela, or the Zimbabwes of this world, the path would have looked very different.

And then the other thing is, it is really important to think hard, and there are ways that we can work together in terms of also measuring that institutional capital, but it should not be added just as another fourth pillar, because it basically -- it's embedded. It's an umbrella issue that is critical for what I call the transformation. And that potential transformation will not, and does not happen if those institutions are not in place. A lot of this structural wealth is just space on the ground.

MR. PILLING: Let me ask you a very specific question about Chile versus, say, Equatorial Guinea. What is it in Chile, that if you could bottle it, and could, you know, help other countries make that transition? Because I mean Chile had very many political systems, it went from Allende to Pinochet, to the Christian Democrats, it's had center-right governments, you know, it's had Ricardo Lagos, Bachelet, but then it's also had, José Piñera.

So, you've had a very varied political system, and yet you had this, you know, fairly smooth transition from copper to these other forms of capital. So, what it what is it about Chile?

MR. STEER: Well, in a nutshell, and of course there are many ways of skinning a cat, and everybody has their own view. But the bottom line is that in Chile, when the Dictator leaves in 1999, because he thought that he would win the public side, because the country was starting to grow again, but instead it was yes or no for to stay. The country voted no, so he has to leave. Poverty was 45 percent of the population was below the poverty line, nowadays it's in the low teens and 10 percent.

That is absolutely crucial tuning point, when new leadership comes, also a new cadre, it becomes generational, once it becomes to a democratic country again.

MR. PILLING: Yes.

MR. STEER: Whether it's being center-left or center-right, there has been a complete consensus, and absolutely crucial importance of institution, the macroeconomic management, what we believe in? In order to --

MR. PILLING: Yes. So, solidity took hold?

MR. STEER: Absolutely. And there's the institutional condition. Now we have our scandals and problems, and we had recently some corruption scandals, just to make it very clear, governance, good governance in a country is not the absence of misgovernance, or not having any corruption scandal, is a resilience and ability, institutionally, to respond to that.

Homi has written, too, about that, about Asia, some Asian countries on that. Chile has that too. So, we are no angels.

MR. PILLING: Yes. Let me turn back to you, Kristalina. I mean one of the, sort of, points of this report really is as you say, this is information that governments can use. So, if you're a government in a poor, or moderately poor country, and you're looking at your -- you know, various capital levels. How do you get from here to there? What are the lessons in this report for a government?

MS. GEORGIEVA: Let me start from where Danny left it. And the thing is that rule of law and institutions that function in a transparent manner is a prerequisite to make good use of the assets you have. Zimbabwe has no reason to be poor, except for poor governance -- failures of governance -- and let's hope that now, with a page being turned, that particular lesson will be put to work.

When you have a more inclusive government where different perspectives can be put forward, then that translates into carefully-crafted policies that make the best of the assets you have. If you are to be a resource-rich economy then how you invest for a long time the extraction of resources, and how you turn this rent into benefit, broadly, for the population, that is your key for success.

Look at Norway. If you are rich on renewable natural resources, and I agree with Andrew that we have to get deeper into understanding that, how you manage it in a sustainable manner and, again, how you lift up the value of what you have, by having good certification, by having to weigh that what is in your hands goes the longest possible mile for your people.

And of course, recognize that we also have countries that are poor on natural resources, they need to look at ways in which the little they have can turn into a good build, building capital, and of course in skilled populations. What we have seen time and again, is that a careful analysis and understanding of assets combined with good governance, goes a very long way.

And I would add here, and bringing more women up in the chain of command in the countries. That goes a very long way for countries that are not particularly rich, to get to a -- to be on a sustainable pattern to get their people to live better lives. And then we also see, and I want to say that for the fairness of it, that even countries that are well governed they also depend on what is happening around them.

In the report, we have the case of Lebanon, actually, it would be exactly the same impact in Jordan, when a country's wealth is going up but wealth per capita is falling drastically. If I remember it correctly, wealth per capita in Lebanon dropped 38 percent -- minus 38 percent. Why? Because Lebanon is doing a global service by taking refugees from Syria and the population of Lebanon, not just because of reproduction in the country, but because of the war in the neighborhood has skyrocketed.

Well, there is also a policy lesson from this. If a country is doing that kind of regional or global public service, the international community has to step up. We cannot let this country to struggle only on its own. So, careful analysis always can take you to very good policy conclusions.

MR. PILLING: Yes.

MS. GEORGIEVA: And then with more women at the top, very good things would happen. Look at The World Bank. (Laughter)

MR. PILLING: You don't need a report to tell you that. Dale, could I --

MS. GEORGIEVA: And I didn't mean myself. Look at this, look at this. Could you please, you ladies get up; this is The World Bank row here. (Laughter)

MR. PILLING: Dale, can I bring you in? We have no sort of representative, in a sense, for produced capital here, for infrastructure. You know, China obviously, for example, are putting huge resources into infrastructure, roads, subways, factories, you know, and cement housing, et cetera. And if you are well-governed country, let's say, with lots of natural resources, let's say lots of oil, how do you choose between, you know, what sort of choices should you make between building up your natural capital; which means investing, I guess, in health and education, technical skills, and you're building infrastructure? Is this a dichotomy? Is there an emphasis question? How would you sort of access --

MR. JORGENSON: The key idea here is the idea that we've just heard about, which is the idea of investments. This is a story about the relative importance of different components of wealth beginning at the lowest level, and rising to the highest level. What is involved in the processes of investment? The World Bank plays a very important role here, but the key thing turns out to be investment in the resources that we've talked about.

We can talk specifically about investment in natural resources, but the big number is human capital. It turns out that we've got to think all along the way as we transform these countries into viable, sustainable, developing countries, and then ultimately into advanced economies of the idea of investing in the basic resources, basic resources being human resources.

That is precisely the lesson of China. China has very, very impressive infrastructure. A high-speed rail that would be an asset to the United States, but what they have succeeded in doing is going from a very, very human capital poor, to one of the better educated emerging economies, and their goal, explicitly, is to transform this into the human capital that's associated with advanced economies.

They have a very clear idea about to how to undertake the investment programs that are going to produce economic development on a sustainable basis. And it turns out to be, primarily, as we've heard a matter of building the human resources that will enable them to undertake this investment.

MR. PILLING: Why don't you come in, Danny? And then I know Andrew wanted to come in on this question as well? And then I would like to open it up for questions.

MR. KAUFMANN: On this question, the game-changing way of addressing that question is for it to become much of a -- less of a trade-off between the two.

MR. PILLING: Right.

MR. KAUFMANN: So, the pie, and the pie of investment, as you say, has to expand. Already, a decade ago, also at The World Bank, we did that study, and the importance of improved governance in the long run, it essentially reduces infant mortality, but by two-thirds, increases human capital, and GDP per capita goes up by three to one. So, ultimately that should not be such a huge trade-off.

Right now in a handful of key Latin American countries, infrastructure investments are paralyzed, let's be very frank. Why are they paralyzed? Because of the Petrobras or the (Inaudible) scandal, and that has come to a complete halt because everything is frozen, and also in the judiciary, and we are suggesting ways, and others also, how that has to move forward.

Again, such a poignant and potent example, that ultimately if we don't fully factor in the importance of institutions and governance, then you're going to be faced with a shrinking pie, and with much more of that tradeoff.

Just to add, what you said is absolutely right, but one of the implications of what we are discussing, is our net worth, and we can follow up later with the authors of the report, that it's quite likely, and we are looking at the numbers, that have poor-governed countries, for poor-governed countries the evaluation of natural capital is overestimated, because the potential of that to be fully transformed into effective wealth is much, much --

MR. PILLING: Because (inaudible) it's stolen?

MR. KAUFMANN: So, already that looked pretty dire, that picture there, but it may be in reality, the more dire, so we need to redouble our focus and efforts on these institutions.

MR. PILLING: Time is running out before we go to questions. Andrew, come in on that question, you seem to be keen to.

MR. STEER: You asked an interesting question about China, and how does this help it? And I think Professor Jorgensen gave absolutely the right answer. But, you know, China would now admit that this kind of analysis is informing how we actually made some mistakes. So, for example, it built loads of factories, and then it suddenly realizes, wait a minute, as this report says, six million people in the world that dying every year from air pollution and over a million in

China.

And they say wait a minute, we've got this wrong; and so if you go to China, as I did in December, beautiful blue skies in Beijing. Why? Because they've said: we want our natural capital, please, and we are going run down or close down our man-made capital. They've closed steel mills, they've closed -- fascinating as sort of the example of: could we please have our natural capital back please? And of course, you can have both.

MR. PILLING: Haven't they just moved it to the west of China, but that doesn't --

MR. STEER: Yeah. There might be a slight quibble with your --

MR. PILLING: And did you want to come in, Kristalina, briefly, and then I'll open up.

MS. GEORGIEVA: Very briefly. I want to thank Professor Jorgenson, because what he's talking about is where we are taking the Bank very decisively, understanding much better this correlation between investing in people and improving the conditions for growth, the potential for development. We have a big human capital project, so you would see us coming time and again on that topic.

And one of the things we realize is that investing in people actually is absolutely paramount if you want to have good institutions. It doesn't mean that you if you have educated population you will have good institutions. But it is, if you don't have educated populations, you're for sure, are not going to good institutions. It's kind of necessary, but not sufficient condition, so let's make the necessary deal.

MR. KAUFMANN: And the reverse also.

MS. GEORGIEVA: The reverse is also true.

MR. PILLING: I have another question I'd love to ask, but let's see if I have time to ask that. Let's have a question from this gentleman here, if you could just identify yourselves, and then ask a brief question. Thank you very much.

MR. SCHILLING: Well, I'm Jud Schilling, and I spent a lot of time working at The World Bank with Andrew, and several other people here. And this is really interesting, because we started trying to introduce the natural -- or the physical capital, in some of the things, and taking into account the depreciation, this work is making very important steps forward, but I think there are several things I think need to be taken in account.

First, in setting up the priorities, I think we have to admit the most important priority of these assets is natural resources; without air, water, food, none of the rest of us will survive. So, that's the basis for all the work that's being done. Then of course, it's human capital that figures out how to organize it, produce and use it, and then the physical capital and the economic activity that does the production and things like that.

And it's also very important to take account of the relations between these things. Andrew made a couple of good points, that the mangrove trees you were talking about, it's not just the production of the food, it's how it affects the water flow downstream, and things like that. So, you take account of that, or the pollution that we create causes a real damage to human capital, and stuff like that.

MR. PILLING: Is there a question mark at the end of this somewhere?

MR. JORGENSON: Listening for the question mark.

MR. SCHILLING: We need to take account of these interrelations, and looking how we go forward. A couple of natural resources that weren't mentioned that have become very strong constraints, and I think to be taken into account are water, and something I just learned about which is sand, which we need for so much construction and other things, are getting scarcer. And water, we've just heard that parts of South Africa are facing water depletion, and other areas are depleting available resources. But you can deplete them for years and years and years, and then you hit the bottom and you're suddenly out of it.

So all of these things; and then just one last comment, since I left the Bank I worked with the Millennium Institute, we've developed an integrated system dynamic model that links the economic, the social, human capital and environmental factors, and shows how they interact and generate longer-term scenarios, to look at these impacts over a long period of time, much more effectively than The World Bank models and stuff which I did a lot of work.

We actually did one in Bhutan which included measuring gross national happiness --

MR. PILLING: I'm going to have to ask for a question, or maybe there isn't one. I mean is the question, do we need to think about thresholds as well, you can't just convert one form of capital into another and hope for the best, you may just, while you're doing that hit a threshold that's catastrophic? Andrew?

MR. STEER: Yes.

MR. PILLING: Okay. That was a very short answer to a very long question. We have a question here, and then one here. Okay. Thank you very much.

QUESTIONER: Thank you. I'm Pierre Karowski. Hearing here about the human resources being valued, human capital being valued, and discounting sort of the future incomes, in these days when we have robots, artificial intelligence threatening around the corner, makes it very, very difficult to try to identify an appropriate discount rate. There's so much volatility in some of these issues, for that volatility has to be impacting the final figures too. There are some things you can predict a little bit safer --

MR. PILLING: Okay. There's a broader question there if I may, which is that GDP is criticized from being a backward-looking measure, wealth accounting is by definition really a forward-looking measure, but the problem is, we can't know anything about the future, we certainly can't know everything about the future. What do you think about that, Kristalina?

MS. GEORGIEVA: Okay. Going back to my analogy with the car, yes, GDP is to drive looking at your rearview mirror only, a very dangerous way to drive. And with wealth accounting, we can project in the future, and of course, it's like you put your lights to see as much as you can of the road, but you sure don't see the end of the road.

MR. PILLING: Mm-hmm. Right.

MS. GEORGIEVA: And you have to accept a degree of uncertainty in your projections. What it means for us is that we have to work hard on making sure that we have as sound methodology as possible.

MR. PILLING: Yes.

MS. GEORGIEVA: And recognize that this is one of many inputs for policymakers. It is not going to be the input, ever.

MR. PILLING: Okay. Dale and then Danny; so, Dale, I mean, we've got this very precise numbers for lifetime earnings, but this could all be wrecked by robots and AI. We may think that we can earn a certain amount, and our job market is taken away.

MR. JORGENSON: Well, the key idea is that you've got to bring to bear detailed data, and that's what The World Bank has succeeded in doing. They have incorporated the most detailed data that is available to estimate human capital and they've captured the great heterogeneity that characterizes human capital from the point of view of the kind of investment that's involved.

The key step though, and this is something I don't think anybody has emphasized enough, and that is that The World Bank is changing its role. It is not only providing capital, that is to say providing loans, and financial resources, it is providing knowledge, and the understanding of the development process. That's what this report represents it represents the forward edge of what The World Bank is becoming. And I think all of us owe The World Bank our congratulations.

I would just like to mention one thing, and that is that with regard to China, we talked a little bit about that, this turns out to be the country where information about human capital is best developed, this is an area of research that the Chinese have pioneered, with the help of my collaborator, Barbara Fraumeni, who's worked there for a period of 10 years, helping them improve their estimates.

The last report, the one before this, five years ago, from The World Bank incorporated a summary of the Chinese study, of their Leader, Hao Jing Li, and this is an indication of the direction that were going to go, and they have succeeded in this report in arriving. And something that is very useful.

MR. PILLING: Thank you. Can I bring in Danny on this question?

MR. KAUFMANN: Yes, to complement what was said. But in the next stage, I think it's incredibly important. We are near 2020, there has to be, for credibility, scenario planning. We are dealing with known unknowns.

MS. GEORGIEVA: Yes. I agree.

MR. PILLING: Mm-hmm.

MR. KAUFMANN: Known unknown means that, and since the future comes in so potently, net present value, you know, into these analyses, there have to be different scenarios. You alluded to that; one builds three, four scenarios. Out of that let's be totally transparent and precise, and we have tried to do that in governance about margins of error.

MR. PILLING: Yes. Yes.

MR. KAUFMANN: What is the range, rather than an artificial sense of precision, because it's incredibly valuable as you say, but this is within a range. Third, let's incorporate those unknowns. What you're talking about?

MS. GEORGIEVA: Mm-hmm.

MR. KAUFMANN: And the institution of capital that we are talking about,

MR. PILLING: Yes. So, you could be a bus driver in Delhi, but your job is replaced by a driverless bus. And you could have lots of oil, but you find you can't -- because of regulations, and tax you can never use it.

MS. GEORGIEVA: Mm-hmm. Yes.

MR. PILLING: A question here from this gentleman, and then we'll go to the back. Lots of questions, that's right.

MR. KHANNA: Hi. My name is Anupam Khanna. I used to be at the Bank too. And I think, indeed, I was also present at the genesis of, when Kirk Hamilton and his team did this, but also when Joe pushed this. But and I'd like to say there were three other trends that Joe was trying -- Stiglitz was trying to pull together, why he thoughts this idea of wealth of nations was important.

He didn't get very far in the Bank, but then he pursued it later. One was the capabilities approach that the markets then were saying. So, to bring in the second one that was actually at the heart of internal criticism of his, which was the fact that we were also in the throes of the privatization and PSP mania, and he was very concerned people were looking at privatization receipts as, you know, selling of stocks and converting them into income flows.

MR. PILLING: Yes.

MR. KHANNA: So, that was another. There were two other things that (inaudible) was also trying to come up with the balance sheet approach. I'm going to my question. I now live in India most of the time. I'm going to say, The World Bank and rest on its laurels, I think it looks like a very good report, but you can do indicators, inter-country comparisons, but when you try to operationalize them, and as a matter of fact for the last eight years I've been trying to operationalize some of these, there are certain policy questions.

And the difficulty goes beyond the intuition of converting future earnings into this. And there are four areas that I'm wondering how they are being dealt with. One is of course the discount rate that Andrew has mentioned. The other bigger problem that we've confronted, and I'll give you three examples -- I don't have --

MR. PILLING: We don't have time now --

MR. KHANNA: I want to give the example.

MR. PILLING: Can you come to the question, please, sir?

MR. KHANNA: Yes. The question is: how do you treat -- I don't know if they've dealt with the whole issue of discount value, of the environment.

MR. PILLING: Okay.

MR. KHANNA: But the pricing issue and human capital is very, very difficult. The third one is inter-country comparison because of the global talent flows. And the fourth is of organizational capital. These are two areas, which are very much at the forefront of research here. Just to give you, I'm sitting in India, in the company when I look at the asset value of my earnings there, they are 10 times -- sorry my asset value of my earnings in the U.S., the same person, the same capital, than if I'm based in India.

Not only that, and as we know in this country if you're working in a firm with --

MR. PILLING: So, I'm going to have to stop you. Because there's a lot of people who want to ask questions, and we are going to run out of time.

MR. KHANNA: Yes. Okay. Sorry. So, these are the difficulties of actually doing it. It affects privatization of Air India, just to give you a complete example.

MR. PILLING: I don't think we can have an example. I'm sorry.

MR. KHANNA: No. But what I'm saying, you have policy issues, and unless you know how to operationalize them, you can't go -- you have to go beyond the issues.

MR. PILLING: Okay. All right. So, we've got the discount rate, and the sort of -- and how to operationalize these, and cross-country comparisons. Let's take another couple of questions; one at the back there, and one here.

QUESTIONER: Good afternoon.

MR. PILLING: And can we have it as a question?

QUESTIONER: Yes. Martin Malory; currently I'm a Diplomat, but as a Journalist that served in East Africa for twenty years I think I went through the other side of this question. The confusion is that when you count the natural resources you should count the natural disasters, because you can't just take the positive side of the nature. If you take the nature, the difference --

MR. PILLING: I heard you say question, but I'm not hearing the question. Can you just?

QUESTIONER: Okay. I think there is a confusion, how do you solve this confusion?

MR. PILLING: The confusion is what now? So, how do you solve the confusion between?

QUESTIONER: Between having the positive side of the natural resources and ignoring the natural disasters, just like decertification and --

MR. PILLING: Decertification, et cetera.

QUESTIONER: -- and active volcanoes and others?

MR. PILLING: Okay. That's for Andrew.

QUESTIONER: Thank you.

MR. PILLING: Thank you. And one here.

QUESTIONER: Thank you. I'd like to offer a question. (Laughter) I'm Eglis Milbergs. I'm co-founder of a nonprofit in Seattle dealing with water innovation, water infrastructure. My question, the implications of this report, groundbreaking report for public policy are pretty clear in my mind. You know, investing in human capital, sustainability, et cetera, all makes sense. But most decisions are made in the private sector, so what are the implications of these kinds of measurements at the firm level or micro level? You know, we are talking at the macro level.

MR. PILLING: Okay. Yes.

QUESTIONER: What can we do at the micro level here, and the impact that might have on the private sector if they were to adopt measures like this?

MR. PILLING: Okay. Those are all great questions. Andrew, why don't we start with you with natural disasters?

MR. STEER: Well, if you went to Davos two weeks ago, you know they do this risk assessment each year, a thousand CEOs are asked: what risks, in terms of likelihood and impact. So, for all of these, these are CEOs of major companies, the number one risk in the two, both impact and probability, extreme weather events. Number two, failure to address climate change; number three, water.

This is all about natural capital, that's what they are worrying about. If you go and talk, as I did, with some of these CEOs of companies like PepsiCo, they say: what am I worried about? I'm worried about water availability, that's natural capital. So, yes, we absolutely need to factor that in.

And so we need to factor also in: how do you how do you deal with climate change? Well, you deal with the stock of bad things in the air, and if each year that passes there's a greater probability that we are going to have natural disasters, that is your natural capital declining. And so again, for next time, I mean we need to try and factor that in as well. And I think, to be very honest again as to the need to do that.

MR. PILLING: And Andrew, while I've got you, do you want to comment on any of the other? So, there was the private sector, the kind of the micro implications of this, and then there were the questions about the cross-country --

MR. STEER: For this I would love to hear Professor Jorgenson who is, in a way, the grandfather of all -- well, you're not a grandfather, but you're the guru who --

MR. JORGENSON: I am a grandfather --

MR. STEER: -- but you are all this as well. So issues like this pricing across countries being different, the discount rate, I would defer my time.

MR. PILLING: Okay. Well, Professor Jorgenson?

MR. JORGENSON: I think the basic lesson here is, essentially that what we need to do is design market institutions, that's partly an issue of governance, but the goal for The World Bank and for us as analysts, is essentially to deal with the issue of how do you design institutions. And here is where measures like the ones in this report come to bear.

They provide the accounting system, not in the form that a business person could use to make decisions about whether to invest more money in fossil fuels, or whatever, but rather the information that includes all of wealth, and that turns out to be 70 percent, at least, for the world economy human capital.

We have to design institutions that will build the ability to invest, and invest fruitfully in situations where we don't have standard markets, financial markets, that's where The World Bank has an extremely important role, admittedly, to play, because they are going to create market-like institutions.

In the case of an environmental work, that's going to be market-based institutions for dealing with environmental problems, including climate change. And for human beings it's going to be dealing with what turns out to be the wealth of the world.

And building institutions like that may seem to be overly ambitious. And I think that The World Bank deserves our admiration for taking on this task, and deploying the kind of talent that it can -- only it can mobilize to move investment and managing the world economy in a fruitful new direction. That's what this report is saying to us.

MR. PILLING: But the question maybe, Kristalina, about cross-country comparisons, or did you want?

MS. GEORGIEVA: Two things, one is on the private sector.

MR. PILLING: Yes.

MS. GEORGIEVA: What at micro level is of interest in this report? I think there are two -- useful for private investors aspects of it, the first one is that looking into the wealth, and how wealth is being managed at the country you invest, is as important as knowing how well it is doing in terms of GDP, consumer spending, and so forth, because if you don't look at the quality of assets and how they are managed, it may be doing very well at the moment but longer term, you may be in trouble.

And second, it tells you that you have interest to actually care about investing in skills and people, and that in terms of where your tax money goes in a country you should have -- you should think about it. You should not -- this is not irrelevant for you. I think that it is not meant to be a guide to investor in a particular country, but it is useful input for investors as they make decisions. It is more kind of a here, high-level, but it is still useful input.

On cross country comparison, we have 141 countries in this report; we will strive to increase the number. It is truly remarkable when you look at the data on groupings, and then you look at individual country data how much you can learn about the country's current status, and future prospects. It would confirm certain things, certain trends that we broadly know; it would give you additional pointers for these trends.

And I certainly believe that looking at the wealth per capita, in particular, the calculations on wealth per capita, really, really enlightening.

MR. PILLING: Thank you. Danny?

MR. KAUFMANN: I mentioned very briefly before, in addition to the wealth measures which are very important in this report, there is also a very important flow measure, and that's then adjusted net savings.

MS. GEORGIEVA: Ah, yes. Mm-hmm.

MR. KAUFMANN: And which takes into account -- it starts with the GDP but then adds and subtracts other elements which are not in GDP, particularly the whole issue of pollution and depletion. It's not fully there, as Andrew suggests, because they are so much of environmental damage and climate changes, it's not fully there, but the framework is there.

And that would be a very important measure for investment in terms of management resources. Sorry to say, Angola, their adjusted net savings, if I recall correctly, looking at the report it's minus 50 percent of GDP. Right?

MS. GEORGIEVA: Mm-hmm. Yes.

MR. KAUFMANN: While Chile is highly positive.

MS. GEORGIEVA: Yes, yes. I agree.

MR. KAUFMANN: So, again, it's not a competition between stocks and flows, all these are important, and they are complementary to each other. So, look at that. Now, if in addition, we manage to integrate, which is difficult, but we can do it, these institutional measures they are incredibly important for investments.

Right now, the risk-rating agencies used our indicators on governance, and so on, if that could be clearly integrated into these that will be additional use for.

MR. PILLING: We can have one more question. Let's go -- I feel terrible now. Let's go here, it's just easier, the gentleman in the blue shirt. Sorry, everybody else.

QUESTIONER: Thank you. I'm just an interested citizen. And thanks to Brookings and World Bank for having this session. One thing that wasn't mentioned is the stock of technology, our ideas, patents, et cetera, for the difference in prosperity between countries. What's the thinking on why that's not included?

MR. PILLING: Okay. Patents, technology, ideas, are they somehow -- are they there somewhere, or is this an extra element?

MS. GEORGIEVA: I'm looking at the author's to answer this question.

MR. PILLING: Okay. It's implicit in the macros and practices --

MS. LANGE: As you say, it is a very important element, and if you look at the national accounts over the last couple of decades this research and development information has become an increasingly important component. We have certain constraints in the data that we use because we have to cover a large number of countries, and we don't have that kind of information for a very large number of countries. But as you say, it is very critical.

MS. GEORGIEVA: So, chapter 11. (Laughter)

MR. PILLING: We may just have time -- this gentleman here has been very patient. Yes?

QUESTIONER: Thank you very much. I came in late, so if this has been addressed, excuse me. But where does leadership play in these issues that we are talking about? It seems to me that as America continues to withdraw from the international stage, we are losing some leadership, or what we thought was leadership, especially in the three issues that those thousand CEOs and Davos talked about; the climate, and the weather, and all the rest of that. So, as we move away, who is going to take the leadership positions in all of this? Thank you.

MR. PILLING: When you mentioned Davos, actually I thought you were going to talk about a man-made disaster. (Laughter) Leadership, does anyone want to address the leadership question? Okay, just quickly.

MR. STEER: Just one from Davos. The best speech at Davos was given by President Macron, and he said: if we are going to lead into the future, we have three obligations. The first is, invest in the future, it's all about education. He spoke for maybe 15 minutes. The second thing we have to do is to share, and the third thing we have to do is to protect. It's great leadership, but it's like he'd read this report. And by the way, just because I'm talking about a natural capital, doesn't mean I don't believe that human capital is the most important.

MR. PILLING: Danny?

MR. KAUFMANN: I'm here, with my wonky hat, and thanks to Dale, he was also my teacher, not just Homi's, so every mistake I make it's mine, but all the -- if there's anything useful, it comes in terms of statistics data, it comes from Dale. But this is addressable and immeasurable. Talking about the private sector, companies have been, already inroads have been made in measuring intangibles, reputation, brand, and so on.

And this is what we are talking about, or what's not yet measured here. Of course it's at the national level has different implications, and how to figure out in terms of discount rates, and so on, but when we talk about institutions, about trust, and about leadership, that can be there.

So, the question is absolutely key, what's happening here, a few blocks from here is erosion in those intangibles, and that matters not only for the U.S., but for many other countries in the world. That is, nowadays, measurable with margins of error, but it is measurable.

MR. PILLING: And of course, the treatment of R&D has been changed in national accounts, in the GDP treatment. So, I mean you can account for these in different ways; it doesn't just have to be in wealth accounts.

I'm not going to try and sum up, but all I will say, as we come to a close, is I think that this discussion has really shown that looking at things through a different prism, here the prism of wealth, can throw a different light on policies. Just one thing that came up, for example, the sort of privatization rage which actually now is being looked at more critically in Britain, in my own country, which you could see as a conversion of, you know, a stock of wealth into a quick flow.

And professor Collier, in a previous discussion mentioned debt, you know, the one bit of stock that we tend to look at is debt, but if it's looked at in isolation that might be misleading, because if you borrow to invest in something else and that something else is useful, then you might think that that's a very valuable trade-off.

If you borrow to blow that money on consumption, then you might think that that's a very unuseful thing to do. So, in other words looking at these things more holistically which I think this report helps us to do, you know, as a way of really refining policy, and also just thinking about things differently. So, I think The World Bank is to be commended, as is our --

MR. JORGENSON: And that's our model, holistically.

MR. PILLING: Holistically, as is our panel. So, I'm going to wrap it up here. I'm going to thank everybody online, and in the audience, and most of all, the panel. Thank you very much. (Applause)

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