Unedited Event Transcript

Book Launch: World on the Move: Consumption Patterns in a More Equal Global Economy

Paolo Mauro (International Monetary Fund) and Tomas Hellebrandt (former PIIE)

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Adam Posen: Good afternoon, ladies and gentlemen. Welcome back to the Peterson Institute for International Economics. I'm Adam Posen, the Institute's president, and it's my privilege to welcome you here today for our first event of the calendar year, the release meeting for World on the Move: Consumption Patterns in a More Equal Global Economy by Tomas Hellebrandt and Paulo Mauro.

You know, there are a lot of things going on in the world today, and particularly in Washington. A lot of things with trade, with fiscal policy with inequality. And, the Institute will continue to grapple with those, and we hope, provide honest accountable leadership on those issues.

But, at the same time, the Institute remains committed to thinking about the long-term and trying to keep policymakers and the public focused on some things that are around the corner, that are not the immediate threat or the immediate opportunity. And it's in that spirit, I'm very proud to release the book by Hellebrandt and Mauro, World on the Move. Again, available at the PIIE bookstore for those of you who are not via Columbia Press, for those of you who are not fortunate enough to be with us in person today.

For a long time, the Institute has been concerned about issues of long-term growth, of inequality, and we've increased our work in that area over the past couple of years, past four years since my taking over. And we've been supported regularly in that effort by the ERANDA Foundation. We're very grateful for their support, investment in long-term research.

But also to the GE Foundation, which has supported our efforts in the areas of infrastructure and investment. Obviously, the book is independent of these supports, but we're grateful to have had the resources to go in this direction.

So, let me turn to the substance. There's been a lot of talk for many years, some of it very serious, some of it very loosey-goosey about Africa being the future, about the rise of the global middle class, and there's some broad patterns that people take for granted.

The huge contribution by [inaudible 02:10] is to really reground this in some very new and solid ways of thinking about this at the household level. And what they find is, with relative rigor and, I think, clarity, is that Africa truly can be an engine for consumption, for growth, and as well as China and emerging Asia in the decades to come. And this isn't some far off thing. This is more than three years out, but it's not thirty years out. It's ten, twenty years out. It's stuff we care about now.

The second thing that I think they find that is important, in which we've heard from others, going back to the book Surijit Bhalla published with the Institute a decade or more ago called Imagine There's No Country, is we think about human beings rather than national borders. Inequality is going down at a rate unseen before in human history.

And while that makes nothing to take away from the horrific income and wealth inequality that US policies have inflicted on its own people. It is an important perspective to remember that it is billions of people who have entered global middle class, who have exited global poverty. And, who will do so in the next coming years, barring terrible policies or terrible accidents.

But the third thing that I think is most fresh and important that Paulo and Tomas would present for you today is that they are tying this to specific aspects of consumption. That we're going to be seeing a world where this global middle class cares a lot about transportation, cares a lot about energy. Is spending less on food just as the Americans, the Europeans, the Japanese used to.

And that has huge implications for global warming. That has huge implications for corporate investment. That has huge implications for capital flows. And that's the kind of insight that they're taking forward and rightly, warning policymakers about.

And so, we're very proud to have the global perspective of World on the Move to help people understand this baseline and this future, going forward. We're very pleased to have with us two long-time friends of the Institute as expert discussants as well today.

The very distinguished Anne Krueger, who, of course, is senior research professor of international economics at SAIS, Johns Hopkins University, many other affiliations. Was long-time name chair, Herald L. and Caroline Ritch Professor of Sciences and Humanities in Economics at Stanford. Was First Deputy Managing Director of the International Monetary Fund from 2001 to 2006, a long-time adviser and participant in our work. And will, of course, give the true development economist perspective on these prospects for Africa, these prospects for investment. Why these opportunities are not coming together and how they might be taken advantage of.

And then, our dear friend Bertrand Badre, who is CEO and founder of the new BlueOrange Capital, which is trying, in practice, to bridge this gap between the opportunities that are there in the emerging developing world and the need of private funds to get better returns. And we had a recent event with him and the Inter-American Development Bank talking about projects they're doing.

Bertrand, of course, was CFO of the World Bank. And prior to that, CFO of a couple of major French banking institutions. And turned, in his current leadership direction after a stay, or during a stay, as a visiting fellow here at the Institute. We're delighted to welcome them back.

I'm going to turn this over to Paulo and Tomas to present, so let me just briefly give their bios. Tomas Hellebrandt was a research fellow here at the Institute from early 2013 till late 2015. He contributed to all our work on inequality and inclusive capitalism, of which this book is in part. World on the Move is his first book and we're delighted to have him with us today to help him do that.

Tomas worked for me and with me at the Bank of England when I was a member of the policy committee there. And was deluded or inspired enough to join us here for a few years after that experience. So, I'm very proud to have Tomas back.

Paulo Mauro is another old friend and distinguished colleague. He's currently the Assistant Director of the African Department of the IMF and is running the critical work with South Africa. He was a senior fellow at the Institute from 2014 to 2016, did work on fiscal policies, some ground-breaking work on GDP-linked bonds with Olivier Blanchard. And, of course, authoring World on the Move.

Prior to joining the Institute, he was twenty years a veteran at the IMF, including managerial positions and research in fiscal affairs in the African departments. These are great, not just friends, but good practical scholars. Honest data people, who are helping us understand the world as we see it on the critical issues of growth, investment, inequality. And I'm delighted to welcome them back to the Institute.

Which of you is going first? I guess Tomas? Please.

Tomas Hellebrandt: Thank you. Before we dive into the analysis, Paulo and I would like to thank Adam for his continued support for this project. Also our colleagues here and our external referees for their very helpful feedback and also a big thank you to all the people who worked very hard to make this work and this book possible.

Let me begin with a roadmap for today's presentation. We are estimating a global, interpersonal income distribution. Which means the distribution of income among people, regardless of their nationality, not between countries as is the case when one simply compares GDP per capita. I will walk you through how we estimate the global income distribution, now and in 2035. This involved a lot of technical and painstaking work. And I will give you a flavor of what went into it, as well as all the assumptions that we have made to project the distribution into the future.

This work is interesting in its own right because it allows us to project global inequality and poverty, which are of course, topics of increasing public interest. But we take the analysis further by looking at the resulting consumption patterns and some of the associated policy challenges.

As Paulo will discuss, we're able to say something about how the relative demand for various types of goods is likely to change over the next twenty years.

The key observation which makes it necessary to work at a highly disaggregated level is the fact that income affects the type of goods people buy. So, to put it in extreme terms, if all the income growth were to accrue to the richest people on the planet, then demand for things like sports cars and luxury handbags would go up, but demand for things like wheat and soap would remain unchanged.

If, by contrast, the income growth were to accrue to the poorest people, then demand for food and other necessities would rise significantly. Concerning potential applications, which we develop in various level of detail in the book, this analysis of consumption patterns allows us to comment on likely infrastructure needs in twenty years' time as a result of increased expenditure on transportation.

The pressure on scarce natural resources and the global climate due to high food and energy consumption, and things like migration pressures as more and more people acquire the resources needed to cross national boundaries in search for a better life.

So, let's first look at the methodological challenges that we faced. We obtained information on incomes from national household surveys. Imagine we lined up people from the poorest to the richest and divided them into narrow income brackets.

Here is the distribution one obtains for the United States. It is plotted on a log scale, which means the income increments are getting larger as we move to the right. This is because income distributions are highly skewed, and we want to capture the relatively few people with high incomes. The distribution has the usual bell shape.

Now provided that the sample is representative and respondents answer correctly, surveys should give a pretty good indication of the distribution of incomes in the population. However, surveys suffer from known measurement errors that bias estimated means downwards and explain why they tend to be lower than national accounts measures.

We therefore don't take the surveys at face value, but apply two adjustments to the survey data to deal with these errors. First, the income of the self-employed is increased to correct for underreporting. Now, this problem seems to be related to tax evasion by the self-employed, and therefore the adjustment is larger in countries with perceived weak institutional quality.

Second, the gap that remains after this adjustment is closed by boosting the share of high income individuals in the distribution to adjust for under sampling of rich households which tend to have lower response rates.

Now this second adjustment is illustrated for the United States in this chart. The blue curve shows the distribution obtained from the survey after adjusting self-employment income upwards. Mean income is a little over 25,000 dollars.

Now, to increase this mean up to the level of household final consumption expenditure in the national accounts, which is over 36,000 dollars, a thicker tail is spliced onto the survey distribution. The tail follows the parietal distribution, which is recognized as a good approximation to the distribution of incomes at the top.

The splice point is chosen to yield a smooth and continuous transition from the survey distribution to the parietal tail, which explains why it is not visible in the chart. The adjusted distribution contains fewer people at lower income levels and more people at higher income levels, which increases the mean of the distribution and also within country inequality.

Now, I will show you a few pictures that will hopefully help you to visualize how we combine the information at the national level into a global income distribution. This is the income distribution of India and Poland. The income data throughout the analysis have been converted into 2011 purchasing power parity dollars to reflect differences in cost of living across countries.

The two distributions are very different. First of all, Poland is richer than India with a mass of Poland's population found at higher incomes than the mass of India's.

Second, India is more unequal than Poland. Its bell curve is broader and covers a wider range of incomes. We are aggregating or summing up individual country bell curves to obtain a global distribution. But before we can do that, we need to rescale the bell curves to reflect differences in population.

So, here the populations of India and Poland are expressed as a share of global population. Now, with the bell curves rescaled like this, we can simply sum up vertically across the countries. And this is our result for 2015.

The regional bell curves are shown in different colors, with each one obtaining by summing up the individual country bell curves in that region. The area of each region is proportional to its population.

Now, looking into the future, how the global distribution will change over the next twenty years will depend on three factors. The first is population growth, which determines the relative size of the individual countries' bell curves. The second factor is average income growth, which determines whether the bell curves of poor and richer countries are getting closer together or drifting apart. And the third factor is changes within country inequality. If average growth is not equally distributed across a country's population, then the shape of the bell curve will change.

So, let's look at the first factor using the United Nations population projections. The world's population is projected to rise from 7.3 billion in 2015 to 8.8 billion in 2035. And this is driven mainly by emerging market economies and in particular, sub-Saharan African and India. As we will see, this will swell the lower tail of the global income distribution and push up on global inequality.

Concerning the second factor, the growth of average incomes, this chart shows that per capita GDP is projected to rise faster in emerging market economies than in advanced economies over the next twenty years according to external forecasters. And this convergence in average standards of living will push down on global inequality.

For those of you who find this projection too optimistic, we also explored a downside growth scenario, which results in more limited convergence.

Now turning to the projections of within country inequality, our baseline assumes no change so that all incomes grow in line with the country's per capita GDP. Now, this is a simplifying working assumption.

In reality, some countries will see a rise in inequality, others will see a reduction. It is motivated by a lack of overall pattern seen in recent trends across countries, and also by our own decomposition of the recent changes in global inequality which show that the contribution of within country inequality has been very small compared to the contribution of convergence in average incomes. But we'll also consider an alternative scenario which assumes that within country inequality evolves in line with the quadratic relationship shown in this chart between inequality and development.

Now, Simon Kuznets suggested in the 1950s that inequality initially rises with development due to growing urban and rural divide caused by industrialization. Eventually, however, the middle class against critical mass are leading to an expansion in the welfare state, which pushes down on inequality.

Now, our adjusted data shows a much stronger relationship across countries than in previous studies. But we would caution against putting too much weight on this in forecasting within country inequality because studies suggest that support for this Kuznets hypothesis from time series data is weaker than in cross-sectional data.

For what it's worth, this scenario projects a decline in inequality in many of the largest emerging market economies which are currently at or past the peak in the Kuznets curve.

Now, we can return to the chart showing the global distribution in 2015, decomposed by region. Now skipping to 2035, we can see the growth of the global economy represented by the rightward shift of the distribution to higher incomes. At the same time, we can see that the areas representing the emerging market economies are expected to shift further than the blue area at the bottom indicating advanced economies. Also apparent in this chart is the expanding size of the blue area in the left portion of the global distribution, which represents population growth in sub-Saharan Africa.

Now, here the distribution is plotted on a standard scale with equal income increments to emphasize the large rightward skew. A large mass of the world's population lives on very meager incomes. All in all, seventy percent of human kind is below the US poverty threshold.

People in this room are of the scale on the right, some of you may even find yourselves somewhere in the embassy of Uzbekistan next door. When we add the distribution for 2035, what is most apparent is the huge reduction in the share of population living on very low incomes. We project the number of people living in absolute poverty, that is less than one dollar ninety a day in 2011 PPP dollars to fall by almost half a billion to 400 million in 2035.

Now, turning to global inequality, the net effect of population changes and growth in average incomes can be observed in this chart, which also shows our estimate for 2003. Overall, the global GINI index is expected to fall between 2003 and 2035 by 7.2 points on a hundred-point scale.

Now, to give you a sense of how significant this is, if you wanted to achieve the same reduction in the United States by transferring income from each person in the top half of the distribution to each person in the bottom half of the distribution, the amount required would be around 3700 dollars per person per year.

Now to show the effect of the adjustments of the survey data, we add the estimates obtained by Lakner and Milanovic for the period 1988 and 2008 using the survey data only without any adjustments, and also our own estimates using the same methodology and projections as well.

Now, the first thing to note is there are adjustments affect the estimated level of global inequality, but they have relatively little effect on the downward trend. The second thing to note is that the downward trend is a very recent phenomenon, beginning only in the early 2000s.

There is evidence that prior to this, global inequality had been rising ever since the beginning of the Industrial Revolution when living standards in the advanced countries began pulling away from the rest of the world. So, we're really living in a period of unprecedented changes in the global income distribution.

Now, earlier I briefly discussed two alternative scenarios. One is a pessimistic growth scenario, which assumes each country's per capita growth gradually reverts to the global mean, which reduces the extent of convergence. If this came to pass, the projected decline in global inequality would be much smaller.

If on the other hand, within country inequality were to evolve according to the Kuznets scenario with inequality falling in some of the largest emerging market economies. This would significantly reduce global inequality relative to the baseline.

I will now hand over to Paulo who will talk you through some of the implications of this.

Paulo Mauro: Thank you. So, Tomas has explained how we derived the global income distribution and has shown that under the consensus view of most economists, we project that global inequality is going to decline and under reasonable alternative scenarios, that result holds.

We think this as interesting in itself, but we also want to use it as a stepping stone to derive what we think is going to happen to global consumption patterns. So our projection of global income distribution in 2035 is going to be the crucial input for what we say about the future of what people will spend on and where those expenditures are going to take place, both in terms of regions and in terms of goods and services that people are going to choose.

In order to get there, I need one more crucial ingredient, which is a mapping of how rising individual incomes translate into changes in what people choose in terms of their consumption basket. As many of you will know, one of the most robust and stable relationships in economics is the fact that as people become richer, as people increase their total consumption, they also reduce the share that they spend on food and beverages. And we have known this since the 1800s through the work of Engel.

What we do is we generalize that approach and we look at several categories of spending. We look at transportation, healthcare, education, and so on. And ultimately, we use this to project global consumption patterns.

One of the striking findings that we identify in this book is that there is a similarly robust relationship between total incomes per person or total consumption for one person and the share of spending for transportation.

As people become richer, initially they spend a little bit more on transportation, but then once they get to about 5000 dollars a year, they purchase their first car. And when they get to about twenty thousand dollars a year, they start flying internationally for tourism. So, we identify this very robust relationship between total consumption for an individual and a rising share of spending on transportation.

Let me tell you a little bit more about this chart. The weird looking wiggly blue lines are lots and lots and lots of observations from household surveys for per capita consumption, total per capita consumption, and the share that goes on transportation.

And you will see that within each country, that is a relationship which holds and then the red line is the panel estimate that puts everything together. And you will see that there is also a certain non-linearity to the relationships. So, as per capita consumption, total per capita consumption, rises on the horizontal axis initially, the share of spending on transportation rises slowly but then it starts rising much faster, and eventually at the very high income level, it sort of peters off.

You may be familiar with the finding that cars are becoming less prevalent in Japan or other countries that are really at the top of the income distribution. So we see that a little bit. But the big deal here is that as people become richer, they spend more and more on transportation.

For the other items, somewhat we are surprised, we don't find a whole lot. For example, people who use macrodata often find the relationship between total incomes and the share that goes to healthcare. We don't find that in the micro-household level data. So we think that's also interesting. But for the rest of this presentation, I'm going to focus on food and transportation only because these are the items where we find the most action, so it's a bit more interesting to look at the results.

Having got the global income distribution and the mapping from total per capita consumption to the shares of spending on various categories, we're now ready to project the whole growth rate of spending on consumption in general, but also on subgroups. Food expenditure, transportation expenditure, and so on. And that's what I'm reporting here for the next twenty years. The most striking finding here is that spending on transportation in countries such as China and India, or the sub-Saharan African region. Spending on transportation in those groups is going to quadruple.

On the other end of the spectrum, in the advanced economies, we don't see a whole lot of action. So, this obviously leads to very important policy implications. Just think about the infrastructure needs that will stem from this pattern. It will be necessary to build a lot of new transportation networks in the rapidly growing emerging economies.

Think about the implications for climate change. We know that transportation is an energy intensive sector and therefore, this tells us that the urgency of tackling climate change is even greater. And even for trade, we know that transportation is a sector where it is more prevalent in international trade than other sectors. So, there are linkages to several policies and one can do this exercise for specific spending items, individual products. We don't do that, but in principle, this is a methodology that can be applied to that as well.

So, what does this mean for infrastructure needs? Well, let me try to give you some estimates. Here I'm a little bit looser than in previous estimation. I'm abandoning the household survey approach here and we're relying on country average information. We're doing panel estimation on per capita incomes. We retain distribution of income variables in our explanatory variable set. And what we're doing is we are using historical patterns, we are doing panel regressions relating paved road to per capita incomes, urbanization, income distribution variables and so on. And the same for railways.

And we use those historical patterns to project what will be the infrastructure needs over the next twenty years. What we find, consistent with what I was showing you earlier, is that in India, East Asia, sub-Saharan Africa and so on, we will need a massive expansion of transportation networks, increasing paved roads in India by 250% and so on. So, this just gives you a sense of the scale of the needs for emerging economies. On the other end of the spectrum, in the advanced economies, we're really talking about maintenance and upgrading of transportation networks, but no longer an expansion of those networks.

One interesting angle on this is that the countries where the infrastructure needs are the greatest are also the countries that are perceived to be worse at controlling corruption. So, it just turns out, this is a simple statistical association. It just turns out that the very countries that need the most investment in infrastructure -- the size of the bubbles here represents GDP in 203, so the large bubbles at the top left hand side would be China and India and on the bottom right hand side, we have US, Japan, and so on.

There is a pattern that tells us that those countries that have the most infrastructure needs are those that have the weakest institutions in terms of selecting infrastructure projects, making sure that the money's not wasted, ensuring that there's no leakage to corruption. And of course, this has important implications for policymakers. It doesn't mean that this is not an issue for the advanced economies, in fact it may well be a very important issue for the advanced economies, but it is particularly prominent in the emerging economies.

So, in the book, we spend a lot of time discussing the nitty-gritty of how you finance more infrastructure, how you ensure that the money's not wasted, and also how we can try to steer countries to make the right choices in terms of forms of infrastructure that are more climate-friendly. So let me give you a bit of a sense, and maybe we can come back to this in the general discussion.

But to begin with, how do you finance these large boost to infrastructure, particularly in the emerging economies? Well, some of it can be done through choices, political choices in the fiscal area. Countries can decide to spend a little bit less on items other than infrastructure. Alternatively, they can decide to raise more revenues. And, of course, those are difficult political choices but they need to be made. At the end of the day, it's not really realistic to think that all of the increase in infrastructure spending can come through changes in fiscal policy. It will be necessary to bring in the private sector. And that leads us, typically, to think in terms of public private partnerships.

Historically, we know that a lot of infrastructure projects, particularly in the transportation sector, have been financed through PPPs. We also know that it's only some projects that lend themselves to that financing modality, So historically, we know that some kinds of highways lend themselves to PPPs because then one can charge tolls. We know that some metro systems can be financed in this way, but not all infrastructure can be financed in that modality.

Moreover, we know that when there are these financing modalities that involve a private-public partnership, typically, this becomes a way in which governments try to postpone the recording of the spending. And there are often guarantees that are provided to the private participants that place the fiscal accounts at risk. So, it's very important that as we move in that direction, governments are careful in recording all of the real and contingent fiscal obligation that they're taking on.

Much more generally, when it comes to selecting the right kinds of projects and making sure that they are appropriately implemented without waste and corruption, it's important to have transparent processes. And I realize that I'm sort of sounding a little bit preachy now, but the reality is, that there is a lot of nitty-gritty actions and institutional checks and balances that are necessary to ensure that this process goes right.

For example, by allowing whistle-blowers to be protected, providing them with financial incentives, so that people can report instances of corruption in practice. Another factor that is often mentioned by private participants as being important is a reassurance of stability of the regulatory environment. So, the government should be perceived as one that can be relied upon, not to arbitrarily intervene with changes in regulations over the long duration of infrastructure projects.

At the most general level, of course, there are 500-page manuals of how you do public procurement that are published by the OECD, the IMF, the World Bank and so on, and of course, those are all very important. But at the most general level, what's really needed is a situation in which there is a level playing field where private providers are competing on an equal basis without any favoritism. And we have to have freedom of press, we have to have investigative journalists that are able to get the information and provide it to the general public.

There's a lot that can be done to increase the amount of financing that comes from the private sector. Bringing in pension funds, insurance funds, making sure that there are no prudential regulatory barriers beyond what is reasonable to allow more of these players to come in and provide financing.

And last but not least, the type of infrastructure that India and so on are going to put in place in the next twenty years, we are going to be stuck with it for a very long time. So it is very crucial that the appropriate choices are made when it comes to climate change. And to the extent that both domestic policymakers and international policymakers can provide financial incentives for countries to make the right choices, I think that's going to be crucial over the next years.

So, I'm going to end on that note. I'm just going to put up a quick summary of what our main findings are and I very much look forward to the discussion.

Anne Krueger: Thank you, it's of course a pleasure to be here and I'm pleased to comment on this study. It's obviously a good one and has a lot to be said for. As was stated, there is a lot of technical stuff in it, and one does have to plow through some of that to make much of it, but it's worth doing, if you put it that way.

I think I will focus on a couple of issues. The first is growth prospects, and the second is PPP as an infrastructure. Let me turn to growth prospects since I don't have much time fairly quickly.

I'm not really sure how important income distribution changes are for growth prospects over the intermediate and long-term for a couple of reasons. Major one of which is that the growth rate itself is a major determinant of savings, at least in the countries I know about. And countries that are growing fast, I have in mind are South Korea, Taiwan, and India, sorry, China, Chile and such and the savings rate shot up.

Korean savings rate in 1960 was minus 3% of GDP. It got up to 38% by 1985. This was not because incomes didn't become more equal, it was not because of that, it was simply that the best predictor of the increase in consumption was not the absolute level, it was the growth rate. When the growth rate went up, the rate of increase went up, the savings rate went up even more.

So, that that became a major factor and that gets me to the point with regard to India—I'm sorry, with regard to this study, and particularly for Africa. A major determinant of growth has been economic policies. And economic policies, in general, in Africa and in much of South Asia, have not been all that conducive for growth. As a result, they have had low growth. If they were to speed things up significantly, by amending policies, I think we would see an increase in consumption, of course, but also an increase in savings and funds available for investment.

These things aren't independent of each other. In the case of India, I can go on for a long time, but I know I don't have time to do that, but quite clearly, they have adopted policies which has led an industrial sector increase in the sense of increasing output and capital intensity. But in a decade, in which they didn't have rapid growth after their first set of policy changes, they have tripled industrial production, no increase in employment in the urban formal and informal sectors.

The informal sector was large largely because people didn't have an alternative. There were not jobs available elsewhere and people have to work. If that were to change, and if indeed, the Industrial Relations Act and other things that constrain Indian entrepreneurs and managers from hiring workers since it's so risky, I think we'd see a change in the savings rate. We'd certainly see a change in tax collections. We would certainly see more public funding.

And I think that sort of putting these things in separate categories is a little bit difficult because I think they do go together, and I think a bunch of the Indian income inequality is the result of people being bottled up and not able to leave, it's still over 70 percent rural. After all this time and they can't leave, so they're on the farm. And yes, they might get a job in the village or something like that or go in and work, sweeping up their cousin's small shop in the nearest town.

But that is not the kind of growth we need, and is not the kind of growth that would give India the sustained high growth rate that is necessary. They did have reforms in 1991, that started a process. Those reforms have pretty much run their course, it's pretty visible what the next reforms would have to be. Without that, getting them above about four-and-a-half, five-and-a-half percent for any given time is going to be unlikely. Let me put it that way.

And I could go on with other countries the same way. With savings rates have tended to rise with growth rates, and in that sense, government revenues have as well, public as well as private saving and that's a major factor.

Let me turn quickly then to infrastructure. I guess one of my questions as I read the book, I think you answered it partially here, was why focus on transport? That's one form of infrastructure, but there are others that are perhaps equally, if not more important and the one that comes right to mind is power. Electricity production. But ports are equally important as are other kinds of things, telecommunications, et cetera, et cetera.

And to focus on one kind of infrastructure, is, I think, why is my question for that, and I will leave it at that. We have other forms and choosing the right form of infrastructure is important. You may remember, among other things, the debate here. When was it? Several years ago, when somebody found that within the expenditure bill for the following year in Congress, there was a proposal for the road to nowhere, as it got called.

In Alaska, where there were 50 people in a village, one side of a river and half the year, they couldn't walk across the ice, and so you needed the road. There's lots of that kind of infrastructure lying around in Africa already. The road to Yamoussoukro, I gather, was fairly major, a fairly modern road that was built I am told that now can't even be seen because of the weeds growing through it. It's not used, so what was the use of the infrastructure? And getting it right, I think, is necessary, but it takes the right incentives for both government and private sector.

I think that that raises a number of things. I think, first off, if you're going to do it at all, you need to finance it appropriately. I think some kinds of infrastructures may be possible, and I used the word may and I'll come back to why. With PPPs, but others are probably doubtful. The ones that are probably more PPP-appropriate are the ones where, indeed, there will be individual use of the final good. And there I have in mind, of course, electric power, for one right away. Irrigation for another. If you don't price water, you get misuse and so on and so forth.

And many of the countries where we talk about inadequate infrastructure, meaning things like roads, and again I have India in mind, but lots of African countries come to mind. What has happened is that the power generation has been public. It has been underpriced, the result of which is government funds have maintained operating costs. Forget investment. Just operating cost, which is diverted funds from the infrastructure where it might more appropriately be used.

In the case of India, I haven't looked at the most recent number, but about two years ago, it was estimated that four-and-half percent of GDP, which was about one-quarter of the Indian government's budget, was spent on subsidies. The subsidies went to make up for the losses of things like the electricity companies. They also went in large part to people for different, so-called social welfare goals, but in many of them, it was estimated that much less than half the subsidy, in one case 15 percent, got through to the intended recipients.

It is not true that subsidies are all that effective, and simply transferring half of the waste from subsidies to infrastructure investments in sensible things in the government, by the government of India and the states would make a huge difference. And the same is true in many African countries. So, I think, we should be very careful on this. But let me now turn to PPP a little bit more. PPP has been successful in some places. There's no doubt about it. Australia, Canada, I think are perhaps among the leaders in this regard, but there are others.

But, there has also been disastrously unsuccessful in some other places. And there are some key reasons why. A major one is misallocation risk. And misallocation risk in contracts has all kinds of consequences. The risk is that the government will change something, you're passing the risk on to the private sector unless you can do something in the contract, which cannot always be done.

In Argentina, you may recall, they tried PPPs in the power sector among others in the 1990s. And they guarantee that the international price of power would be -- the electric companies would always guarantee, sorry, that they could charge the international price so if the exchange rate changed, they could change it. Well, the exchange rate changed but they didn't permit the power companies to change their prices and electrical shortages have been a hallmark of the Argentinian economy ever since. The same has happened in other countries, I just picked on that.

In India, PPPs were relied upon very much during the Singh administration, particularly the latter half. And in that period, all kinds of misallocation risk happened and almost all of the PPPs, that were the big ones, I don't know about the little ones, the headline ones, were picked up, were found in court and delayed. And when the new government came into power, a newspaper estimate, I have no idea how they made it, but there were an estimated 15 billion dollars' worth of goods have been spent by a public sector on PPPs that were halted, as the debate had gone to the court as to who owed what to who.

PPPs are nothing that you can do, unless you're sure that you could make sure that whoever is bearing the risk also has control over the situation and pays for the consequences. And as long as the government regulates power rates, and prevent them from changing the way they needed to change. You got a big problem because the power companies will lose money, and/or they won't go in at all, which is, I think, the more likely event.

The last thing I guess I want to say, the last thing I want to point out is the authors seem to think that PPPs are subject to more corruption than public procurement. I'm not at all sure that's true. I think that mankind is ingenious enough that you can find the corruption either way, as much as it's going to happen. And particularly, in the case of public procurement, as we all know, there are lots of studies that demonstrate that that has been a major problem over the years.

PPPs may or may not help with that one. They are subject to corruption too. If, indeed, something goes wrong and the private winner of the contract underestimates his expenses, he can simply walk in and simply walk away in a number of cases. It goes both ways. I'm not convinced that either one of them is that.

But I guess the last and final comment would be this. Yes, you need more infrastructure if it's the right kind. Some of it has to be done by government. And much of that is of the kind like the road from the village to the town that probably cannot use a toll road. In those cases, it has to be publicly financed. What's happened with PPPs is they become the politicians' excuse, in my view, for not raising the necessary revenues.

There are ways you could reallocate resources from this, especially subsidies. There are ways that you can raise revenues, and instead of doing that, what has been happening is that it's PPPs because that's the cheap way out. It doesn't cost you anything to raise political capital as it would to raise taxes, or as it would to cut subsidies and so on.

But for healthy development, I think it's necessary anyway to cut those subsidies and to raise those tax rates and so I don't see the PPPs as quite as much of a positive answer as I think the authors do. Although, it clearly does have a place. Thank you.

Bertrand Badre: Well, thank you very much. I would equal my predecessor by thanking you. It's extremely good to be here today for many reasons, first one, I had a great and happy year with you last year. So, it's good to be back. And my year with you started with the first review of your first draft of the book last year, and I must confess that was part of the many things that pushed me in the direction I've taken today to create my own business.

So, you are my business case so I hope you are right. More importantly, what you said -- I'm not an economist so I will not enter into that field. I am a practitioner, and what you explained and what you try to anticipate, really, it goes two things. My immediate past at the World Bank where I really try to see how an institution as a World Bank group can accompany that and be as effective as possible in these changes. And also my immediate present and future, which is how you can mobilize money of the pension forms, life insurance, et cetera into that space in appropriate conditions.

So, that's really where I'm in, I think I'm at the right place, so thank you very much.

I was also amused by the fact that you started your book by mentioning stove. One of the most impressive trips I've done with the World Bank was in Mongolia. They brought me like 200 kilometers away from Ulaanbataar. For those of you who don't know, in Mongolia, in Ulaanbataar and nothing else. I mean, you have tents everywhere.

And so, I met a farmer in a tent, and probably it's the same tent as 500 years ago. But then you enter the tent and then you have LCD screen, you have the old wooden staff, and the guys say "Thank you very much to the World Bank, because the World Bank paid for the solar panel, which basically brings me power and they pay for the Wi-Fi. And, you know, with my cellphone, I have access to a catch-on insurance product that has been put together by whatever Swiss insurance and the World Bank so I can control the cost of the insurance of--." Well, that was really -- and the stove in the middle, it was a stove which was called not intensity but on the contrary, pretty good actually. So to be more serious, two brief comments and something a little bit more detailed.

First, I was really interested by the way you approached the need for infrastructure. You focused on transportation, as the same question, I think it's not only transporting power; it's absolutely critical, too. And for transportation only, you come with a staggering figure of 48 trillion. I think almost 10 trillion, we don't really know what it means actually. For 48 trillion, that in itself, way bigger than any analysis I've seen for all of infrastructure that was published by the World Bank, by Mackenzie or others, so I think it just says that whatever is your approach, you mentioned the values approach from experts, a survey of executives et cetera. I mean this is a very, very big issue and it's no longer time to discuss it, I think. At the end of the day, whether it's 40, 50, or 60 trillion; it doesn't make a big difference. It's time to action and I think this is really, that's really my first one, so we really have to move to action.

Second thing, again, I think I'll just say that your review of the pros and cons of the world of infrastructure I think is -- I mean, is pretty well-documented. We know that infrastructure is positive, you can qualify that in economies. But I really enjoy the importance you put on the risk and corruption in particular because people at least in the back of their minds, it's not really put up front, but now that I'm talking to investors, this is the first question they raise. So are you sure the money is there? And it has painful implications. I mean, when you want to transfer money now, it takes you ages because the banks are nervous to say, "Oh, where does the money come from? Is it true?" et cetera, and this is a big issue, I can tell you. Now I'm having very well-known European, American investors willing to put money in my staff, and they are pissed off because it takes them two weeks to transfer the money because of all these constraints. So I think it's important to know that there is a risk, but we have to find ways to handle things in an appropriate manner and not run the risk of freezing the old system because of too much compliance, and that's a side comment.

More importantly, let me focus on the supply and demand on these infrastructure gap equation and the financing. I think it's absolutely central. Again, if we're talking about dozens of trillions, we cannot do business as usual. It's as simple as that.

So we need a paradigm shift and this is something that you hint at in your book. This is something which I've tried with my colleagues at the World Bank to push and I hope it will continue and this was really what was behind the report that we collect with the IMF and the various development banks published in [inaudible 0:52:49] 18 months ago go from billions to trillions. It's really highlighting the fact that public transfer are limited. These are in billions, the needs are trillions, although we get there and it's mostly about infrastructure.

So the first part is obviously public resource, luckily. So raising the tax on the ground, that's absolutely critical. It's also some mobilizing local savings. I mean, it's not just public money; it's also private money. Again, we can discuss a way as the [inaudible 0:53:17] Finance Extension of the Suez Canal by taking a significant cost through savings from Egypt, but he did that with local money. And so pretty more can be done on that side.

But you can also engage with the private sector and that, I think, is your critical point. On the private sector, on the corporate side, on the construction side, but so on the financing side, again, domestically and internationally. And it's a very big issue. It's difficult after the global financial crisis because each actor of this financial sector is under stress. I mean, the banks are struggling for their profitability. The regulatory framework is by no way incentivizing the banks to do that. So they are really -- whatever, I mean, growing, taking risks, going long-term, being exotic, not very interested, so that's the real issue.

The Institutional investors, I mean, technically you could argue they manage under a trillion, so this is exactly, the money's there and you have their needs. But they are paralyzed today by the interest rate environment, I mean, they are paralyzed by the negative rates, they are paralyzed because they don't know really where the rates are going. And they are not equipped to handle this. They are only equipped to enter projects on the ground, they don't have people on the ground, they're not our banks. So they don't know what's going on in a given country, so you really have to help them move their money at the right place. And the [inaudible 0:54:29], which is a multilateral system. The development banks, they're under pressure because multilateralism is under fire. Let me put it this way: capital increase, which was probably obvious 18 months ago, is probably not that obvious today. And we still have a cultural issue. I mean, this is an issue of public-private, and public and private don't work naturally well together; it's difficult.

That comes to my last point, which I think is the real reset. We need a reset at the macro level and we need a reset at the micro level at a certain point. At the macro level, I will repeat what I think David Lipton in the very same room said six months ago when he came here. We discussed infrastructure and he said, "Well, at the end of the day, the G-20 has all the capacity to mobilize for infrastructure. You have the regulator so if it's a regulatory issue, discuss it. You have the Ministry of Finance so if it's tax issue, discuss it. You have the OECD guy so if it's a transfer, you should discuss it. But stop talking and move." That's what you call moving from Ohio to California -- corrective action. So we need to discuss this, we need to send a very strong message that it's time for action. If we really believe it's true, we have the capacity. We don't have to reinvent the wheel somewhere else. So that's really this macro reset where we have to put the factors and, I think, I hope your analysis will help.

On the micro point, I will not repeat what you just said on PPP. I think it's absolutely central. PPP are not well understood in general. People think it's about finance; it's about risk, actually. It's really is taking care of which risk, et cetera, and it's difficult. It's really difficult. I mean, I have many interviews on that and what I want to challenge you, I say, "What do you think is the safest country on earth?" And usually they come with three -- Singapore, Switzerland, and Norway. These guys are relatively big countries, reliable, rich, et cetera. And one of the big PPP issue is in Norway, surprisingly. I mean, they put a big PPP for gas distribution, then they change the terms of the contract, and now they are being sued by the entire world.

So you see it's not just a poor emerging market, it could be Norway. So I have nothing against Norwegian, and I hope they would finance my own business so I showed the brackets. But my point is that PPP are difficult so we have to train people, we have to provide support, we have to certify, we have to standardize things, it's a lot of things that needs to be done. We don't want to reinvent the wheel every time, but you said a lot so I don't want to spend too much time on PPP.

I think, on the Institutional investor front, this is really a seam of infrastructure as an asset class. We really need to work on that. What does it mean? What are the risks and return which are expected? What else the good practices? What is the regulatory framework setup? It's not that difficult. But we have to be serious and join forces. I think this is extremely important. If we don't build that environment, forget about it. As I often say, an institutional investor is not paid to think out of the box. So since he will not change this box, we have to design a box where he feels comfortable. And that's back to the G-20 point, but I think it's critical.

And the last point is on the development banks. I think development banks are focused on financing themselves. It's not enough. At the end of the day, if you add all the money put together by the development banks, it's on right around 50 billion per annum. We are very far away from the trillions. But they can mobilize money easily. They can have track money easily. They can pool people around the table. So I think it's as much a cultural issue as a regulatory issue, but we have to move in that direction.

And the last point is, again, we have also to say and that's your road to nowhere, which leads me to that point. When you say 48 trillion, nobody knows what 48 trillion is. There are so many zeroes. So we have to manage hundred thousand projects at half a billion and that starts to be a little bit striking. So we have to focus on the so-called 'bankable' projects. So we have to create a circular system, which goes with stability in the country, stability of the framework, the project or framework, et cetera, but also the capacity to replicate things.

Once you've done a great solar farm, do 20 solar farms instead of reinventing every time and spreading risk of corruption, et cetera. It's difficult and that's why, I think, one of the reasons BlackRock, actually, which is a large asset manager made the decision to basically go on the ground in Mexico and they say, "Well, we have travelled to find infrastructure to finance so we will buy an infrastructure company in Mexico then we'll do our own portfolio in Mexico." So we have to be innovative and we have to go in that direction.

So thank you very much. I keep my business case, I'm quite comforted this morning, and good luck.

Adam Posen: Thank you, Bertrand. Thank you, Anne. If I can invite all four of our speakers up to the podium, please. As I said at the start, the Institute's very proud to have this project as one of our lineage of projects, not just on inequality and growth, but thinking about the long-term and the broader issues. And I think to have a combination of Anne as the high-level policy practitioner and Bertrand as high-level financial practitioner, combined with the deep analysis that Paulo and Tomas gave us is a very powerful combination.

Paulo, before we start, or Tomas, can I ask you to just say very briefly some thoughts on power grid, power generation? Again, it may just be you didn't have the data whatever, but just informed speculation. How should we think, is there likely to be an Engel curve in power, how should we think about that issue since both Bertrand and Anne I think rightly raised it?

Tomas: So, I will answer the question, but let me first thank both discussants, it's really great to have feedback from a practitioner and an academic and policymaker. So, thank you, Bertrand, thank you Anne.

I have to say, on a personal note, it's really a great honor for me to have Anne Kruguer, Professor Kruguer as my discussant because I confess, one of the reasons why I went to graduate school in economics is that I read her seminal paper in the academic economic review -- American Economic Review on The Political Economy of the Rent-Seeking Society, 1974 paper.

And that paper makes a very important point, which is germane to the discussion and also germane to much of the discussion these days, it shows that when you have trade restrictions, or more generally when you have government regulation, that creates rents. And when you have rents, you have rent-seeking behavior. So, it's very important that when the government regulates and when there's the potential for arbitrary intervention by government officials in trade or in infrastructure, as in this case, then that creates the scope for a quid pro quo which is deleterious to business.

So, it applies to trade, but it applies also to the infrastructure work that we have just presented. So, the question is on why did we pick transportation as opposed to energy, more generally? And the reason is that we are very cautious, very modest researchers. The reason is that we were grounding our analysis in consumption surveys, and we had data on food expenditures, transportation expenditures, and so on.

So transportation at the consumption level is something which can be cleanly linked to domestic consumption, whereas power is something that has a lot to do, not only with domestic consumption, but it also has to do with exports. So for example, if you are China and you export a lot, maybe a lot of your power generation is attributable to manufactured products that you're sending abroad.

So we would lose the tight link that we have to the consumption surveys that were the baseline for our work. That said, if I can speculate, I would speculate that the 48 trillion would become at that point, gazillion. I lose track of the orders of magnitude and exactly, I agree with what both of you said.

The point is just to sensitize to the scale of what's needed and therefore to start thinking big, thinking about a new paradigm, maybe that's the broader message beyond the specific number that we came up with.

Adam Posen: Thank you. One more thing, if Tomas, you could give a brief response. Anne raised the issue of, essentially, downside risk to the growth projections you had because of these histories and continuations of not-great policy mixes. You mentioned and showed in some of your initial charts the idea of your downside scenario of consumption. Could you just say a little bit more about how the results change if you assume a lower rate of growth going forward?

Tomas: So, I should say upfront that the growth projections that we used, we didn't do them in house. We basically, used external forecasters such as OECD, IMF, and consensus forecast, so it's a little bit difficult for me to know what assumptions underlie those forecasts.

But, if you look at the scenario which assumes the downside scenario, which assumes that GDP growth reverts to the global mean experienced over the past few decades, then on the inequality side, the reduction is far smaller.

We haven't actually done the projections for consumption under that, for transport and food for that scenario, but I would say, given that the average growth rates would be significantly lower, it would probably be half the size or something.

Adam Posen: Great, thank you. Let me now open up the floor to our audience. There's a standing mic there if you're able to go right there. If people could just please identify themselves.

Peter: I'm Peter McPherson. Very interesting, interesting study and very helpful. I build on the question, I think, you first asked is why only transportation? I mean, what about health? What about education? And as you suggested, if you take the projections of all these needs, the zeroes become too much?

I particularly think about health, where I think the expenditures could be huge. And it seems to me that people may well be willing to allocate proportionately more money there than some other ways that the technology is available, which it seems like it might be. Thank you.

Paulo: So, on healthcare, in fact, one of the most interesting findings to me was a non-finding. Or the finding that there's no clear relationship in the data, let be more specific here.

So, when you look at macroeconomic data, in the advanced economies there's a very well-known finding that as countries become richer, spending on healthcare tends to rise as a proportion of total GDP. And that's most pronounced in the case of the United States, but you also see that in advanced economies more generally, so the interpretation, usually, is that, well, healthcare must be a luxury good.

Meaning that as people become richer, they like to spend more on healthcare. That's the interpretation that you get from looking at the macro data, we were surprised that when we were in the micro data, when we went to the households surveys, if you look today, within a country, it doesn't matter which one, you do not see that spending on healthcare rises more than proportionately with incomes.

So, if you look at the share of spending of healthcare of the rich and the share of health spending on the poor in the United States or within some other country, you don't see that relationship. Of course, healthcare spending rises as people become richer, it's not more than proportionately, which suggests, based on the micro data, that healthcare is not a luxury good, it's a normal good.

So how do I put those two findings together? I can speculate, it's not something which is in the book, I'm speculating. I think the reason is that a lot of what we saw in the advanced economies was cost push and you know, the pharmaceutical companies were able to increase costs, the medical profession or the way the hospitals are organized is one of the factors that underlies the macroeconomic relationship.

But to answer your broader question, of course, very difficult choices have to be made between infrastructure and other items such as education or healthcare which can also promote economic growth. Our sense is that probably, people right now are underestimating how much they have to invest in infrastructure in order to keep up with the natural pattern that as people become richer, they want to travel more. We're probably not preparing for that. And it will happen very strongly in the emerging economies over the next twenty years. That's our sense.

Adam: Thank you very much. Someone else, please. You can get the microphone there, please.

Will: Will Matton from [inaudible 1:09:15]. I thought that your Engel curve for food demand coming down seemingly uniformly, I think there's a richer story under there. If you do have sharp income convergence, more rapid growth of income in the poorer countries, the food consumption patterns there continue to rise for quite a long time if you think of it just in terms of total value rather than thinking of it as income shares.

Now, it rises because of a move away from staple foods towards livestock products in particular, which have a lot of implications for markets for agricultural products. And in the short run you get, quite a lot more pressure on agricultural markets if you have rapid convergence.

One thing I wasn't quite sure, I was wondering if you have a summary, a statistic there for how rapid the income convergence is in your scenarios that have come? You do have more rapid growth in poorer countries, you mentioned, but I just don't have a good feel for how much more rapid it is, in terms of say a convergence elasticity or anything like that.

Tomas: I haven't got the convergence elasticity, I can just say that the per capita GDP growth in the base line scenario assumes 3.4 percent growth on average in emerging markets and 2 percent in the advanced economies.

Adam: Is there -- yes, please. So we have a travelling mic up front and a standing mic up at back and people can feel free to make their way to the standing mic.

Emmy: Okay. Emmy Simmons and I'm going to speak largely with my global panel on Negro voucher and food assistance for nutrition cap. We've already mentioned, or people have already mentioned, the Engel Curve issue and the Bennett Curve issue, which of course is the next one. But there also seems to be emerging a really close relationship between food consumption pattern changes and health care costs. Not just health care costs that are incurred by the individual, but that are incurred in terms of health care costs for the economy as a whole. And the rising rates of overweight and obesity are actually, rapidly replacing the costs of undernutrition in many developing countries. And those rising rates of overweight and obesity are very much associated with rising global burden of disease. So I just wondered how you are taking that into account? So that's one question.

And the second question has to do with your assumptions regarding behavioral changes and that point, I think, that Tomas had with regard to green choices. What kind of technology innovations are you looking at or are you assuming are going to be developed and offered in the next 20 years? Things—everything from ride-sharing to more renewable energy generation, micro-grids, that sort of thing, and how that's going to affect people's behavior and their consumption choices. So there's embedded assumptions that I would just love to hear more about and I'm looking forward to reading the book, so thank you.

Paulo: So, two questions there. One relates to food and what it does to health and the other on the technology particularly as it relates to infrastructure. Neither of these is something where we go in a lot of depth, but we discussed it a little bit in the book to, frankly speaking, to also encourage others. We give some thought to it, but we also encourage others to use a methodology like ours in order to go into greater depths into these issues, but on the rising spending on items that are not good for one's health and also not good for the environment. We know that as people come out of really extreme poverty and start being working poor, but not sort of really, really, really poor, at that moment, people switch into eating a little bit more meat, eating a little bit more fish, and perhaps, as a treat, having some sugary drinks as well.

So that has implications both for health outcomes and also for the pressure on natural resources. We discussed these a little bit, we don't go into a whole lot of depth, but we want to alert that it is something that is going to happen and it is something that needs to be looked at because, again, the numbers are quite striking.

On the scope for technological progress to kind of undo some of the results, I think ride-sharing is promising, it's kind of exciting and interesting. I don't think it's really going to change the main results in the sense that I don't see that the scale of it particularly in emerging economies is going to be such that it overturns some of the main results. I see a lot of scope for use of renewables in energy production. In fact, it's very exciting that the costs are coming down.

Basically, what we're trying to do is we're trying to sensitize that, to the extent that moving into more efficient technologies is helping, that's certainly something where both home governments and international institutions could think about providing financial incentives to steer the technology in the right direction. As more and more people go, for example, into renewables, presumably, there's greater economies of scale and the costs come down. So we touch on those issues, but of course, we're not going to resolve them.

Adam: No, no, thank you. And of course, some of the things you were just saying, Paolo, I think complement nicely the Bertrandt and before that David Lipton call for some level of global coordination and encouragement. I like Bertrandt's image of putting them in the right box and similarly in the green technology sector. We've come to our witching hour. If someone has a brief question they would like to put forward? Barry, I can count on you to be brief or be shot.

Barry: Barry Wood. My question is, since your handout is about inequality, what about the United States? I mean, the journalistic perception is here, that we're way off the tracks in terms of higher income inequality than we've ever had. So what are the trends in the US and Europe?

Adam: Thank you. A very, very interesting question.

Tomas: So if you look at the trends in -- I'm assuming you're referring to advanced economies. The United States and, to a lesser extent, United Kingdom do stand out as the countries where over the past 30 years, inequality has increased the most. But it is by no means a general picture. We present some numbers in the book, which we look at it in the global perspective and, if I remember correctly, out of all the countries in the world over the past 15 to 20 years, half have seen a reduction in inequality. Third have seen a rise, and the remaining have seen basically within one GINI point of zero.

So it's certainly not a generalizable proposition, and that in fact suggests that, as I had mentioned in the beginning, a lot of the rise in inequality in the US is self-inflicted, that it's a result of domestic policies rather than, you know, globalization or things that affect all countries more or less equally.

Adam: Thank you, that was very clear. Our discussions have been superb, our authors have been great, the book is World on the Move, worth your time, worth everyone's time, very rich set of issues. Thank you for getting our new year at Peterson Institute off to a great start. This meeting is adjourned.