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Should Developing Countries Fear Secular Stagnation?

Uri Dadush

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OCP Policy Center

Ryad Business Center – Aile Sud, 4ème etage - Mahaj Erryad - Rabat, Maroc

Website : www.ocppc.ma
Email : contact@ocppc.ma
Tél : +212 (0) 537 27 08 08 / Fax : +212 (0) 537 71 31 54

About the author, Uri Dadush

Uri Dadush is a senior associate in Carnegie's International Economics Program.He focuses on trends in the global economy and is currently also tracking developments in the eurozone crisis. Dadush is interested in the impact of the rise of developing countries for financial flows, trade and migration, and the associated economic policy and governance questions. He is the co-author of four recent books and reports: Inequality in America: Facts, Trends and International Perspective (Brookings, 2012), Juggernaut: How Emerging Markets Are Reshaping Globalization (Carnegie, 2011), Currency Wars (Carnegie, 2011), and Paradigm Lost: The Euro in Crisis (Carnegie, 2010). He has published over a dozen Carnegie papers and policy briefs as well as numerous journal articles.

Foreword

The pace of global growth has tapered off since the crisis and the ensuing rebound. The concept of 'secular stagnation' was first used in 1938 by Alvin Hanson in reference to the American economy during the Great Depression. It refers to a situation where growth is slow over a protracted period, underemployment prevails and inflation is low. In such situations, the propensity to save tends to increase as a result of uncertainty and pessimism, and liquidity – which depends on interbank lending - tends to dry up as banks fly for cash. This translates in turn into a reduction in the demand for loans which puts increased easing pressures on central banks. Under such conditions, central banks are obliged to take exceptional measures to stimulate loans and demand, including unconventional tools such as quantitative easing.

The debate over secular stagnation opposes those who argue that counter-cyclical macroeconomic policy response is the answer and those who consider that slow growth is a normal state of the economy and that periods of rapid growth are the actual exceptions. Among those who believe in secular stagnation, two major school of thoughts emerge. On the one hand, Paul Krugman and Lawrence Summers argue that the post-crisis lull results from a demand problem. On the other hand, Robert Gordon (2015) believes that stagnation is the result of a structural slowdown in innovation and productivity, as well as demographic factors.

While the debate usually focuses on developed countries, we acknowledge and praise the contribution of Uri Dadush to extend the debate to developing countries. In this paper, he provides a review of the concept of secular stagnation as well as its symptoms. He explains that although long term global growth may not return to its pre-crisis level, fears of secular stagnation are exaggerated. In fact, evidence that secular stagnation is affecting developing countries directly is weak. However, globalization, interdependences and trade linkages can affect developing countries, and they should expect a slower growth in their external trade in the future. To illustrate this case, Uri takes Morocco as an example and highlights its commercial relationship with the European Union. Slowing population growth will affect headline growth in developing countries, but not necessarily per capita income growth, especially in countries that take advantage of the bulge in their young labor force. Moreover, developing countries tend to adapt existing technologies rather than rely on creating new ones, so whatever slowing is evident at the frontier will only affect them at the margin.

The analysis provided by Dadush suggests to us that In Africa, growth prospects may be affected especially favorably by these demographic factors, by the gradual emergence of a middle class, and by the spread of technologies. The continent has a still largely unexploited natural resource base as well as incipient capacity to capture more of the value added in transforming them. in the light of the difficult global economic context, Africa's increasing potential can constitute one of the drivers of growth at the global level. Africa's growth can come from knowledge transfer, diversification as well as sectorial transformation, all of which require investment.

In this perspective, international institutions have a crucial role to play in mobilizing financing for Africa's development.

Middle-income developing countries are at a different stage, however. Sustained growth in middle-income countries requires diversifying the economy through the growth of services and the diversification of exports, helping countries become more resilient to external shocks, particularly to the fall of commodities prices; providing boost in competitiveness by undertaking measures to improve the quality fo the work-force and of the business climate, thus reducing costs, especially in labor-intensive sectors; protecting investors and encouraging private activity in the productive sectors; enabling the move to close on the world technology frontier, hence, beginning to occupy positions in the international market for goods and services that are technology-intensive and employ large numbers of skilled laborers.

Globally, the South's economic growth will certainly be affected by the slowdown experienced by most developed countries. Yet, that does not signal secular stagnation in developing countries. In effect, their population is growing, internal demand is increasing, and they are rapidly adopting the transformational technologies that advanced countries adopted long ago. This process is today especially evident in the lowest income economies of Africa and throughout the world.

Karim El Aynaoui
Managing Director
OCP Policy Center

Should Developing Countries Fear Secular Stagnation?

In the large advanced countries, GDP is little higher than the pre-crisis peak of 2007, sparking concern about "secular stagnation". Since 2007, the GDP of the G-7 countries as a group and of the United States has grown at rates near 1% a year, a fraction of the pre-crisis average growth rates. GDP in Japan and France has barely grown at all, and in Italy, it is 9% below its pre-crisis level. Secular stagnation is the term famously used by Alvin Hanson to describe the prospects for the American economy, in his presidential address to the American Economic Association in 1938, 9 years into the Great Depression[1]. However, his gloomy forecasts turned out to be spectacularly wrong. Just a few years later, the United States was pulled out of its doldrums by arms spending and subsequent decades witnessed America's great post-war boom. Today, the world economy is far from depression, but the current drumbeat of the IMF, OECD, and of many prominent observers, that global growth is now in the "new mediocre" and that secular stagnation threatens[2], is reminiscent of Hanson's admonition.

This policy paper examines the case for secular stagnation and focuses on what the syndrome of concerns that underlie it implies for developing countries. The concerns are far from idle, since economic growth in developing countries has also slowed sharply in recent years. As the Table[3] 1 shows, growth in developing countries as a group in 2015 was over 2% slower than in 2011, a year when it was in line with the long-term pre-crisis average. Though the averages may have been skewed by severe crisis in the Commonwealth of Independent States (Russia in particular) and in Latin America (Brazil especially), all developing regions slowed, in some cases, such as the Middle East and North Africa, growth halved.

Table 1: GDP growth (constant prices, percent)

Country Group Name	2011	2012	2013	2014	2015
Emerging market and developing economies	6.294	5.27	4.914	4.598	3.983
Commonwealth of Independent States	4.795	3.521	2.105	1.079	-2.849
Emerging and developing Asia	7.826	6.92	6.908	6.764	6.587
Emerging and developing Europe	5.422	1.197	2.821	2.791	3.519
ASEAN-5	4.722	6.201	5.061	4.591	4.75
Latin America and the Caribbean	4.88	3.166	2.976	1.302	-0.081
Middle East. North Africa. Afghanistan. and Pakistan	4.469	5.014	2.302	2.753	2.535
Middle East and North Africa	4.551	5.078	2.13	2.613	2.336
Sub-Saharan Africa	4.964	4.302	5.205	5.051	3.367

Source: WEO Database, April 2016

(1). Hanson, 1938.
(2). IMF, Spring 2016.
(3). IMF WEO database, April 2016

This has prompted widespread pessimism about the prospects of developing countries and led to a large-scale withdrawal of capital flows to them. Yet the GDP of this group is today about 40% higher than it was in 2007, and this advance occurred despite the crisis in advanced countries and the ensuing very sluggish advance in world trade.

This paper will argue that while there are indeed good reasons to assume that global growth in the medium and long term (5-20 years) will not match that of the extraordinary pre-crisis period, the fears about secular stagnation are overblown. It will also argue that much of the evidence often cited in support of the secular stagnation hypothesis – such as that related to technological exhaustion and demographics – does not apply to developing countries, or at least has much less bearing. To be sure, globalization has made all countries more dependent on each other, and so a secular slowdown in advanced countries will adversely affect developing countries. However, growth in developing countries will continue to depend primarily on domestic factors. Indeed, I will argue that some of the evidence cited in support of secular stagnation in the United States and other advanced countries actually reinforces the case for optimism in the growth prospects of the developing world.

Reasons to worry

Over the 25 years before the financial crisis, world GDP grew at a rate of around 3.3%, in constant prices and at market exchange rates. Since the pre-crisis peak was reached in 2007, it has grown at an average rate close to 2.1%, only about 1% above the world's population growth. As a gradual recovery of advanced countries consolidated in recent years, world economic growth has averaged 2.5%, and there appears little prospect of an imminent acceleration, much less a return to pre-crisis growth rates[4]. Is this secular stagnation? Unfortunately, there is no accepted definition of that term. A plausible definition might be a state where real per capita incomes are flat over a long period- such as the world experienced over centuries prior to the industrial revolution[5] - or a state where real per capita incomes are declining over a long period as was the case of the United States over the decade to 1938, when Hanson delivered his address. By that definition, we are not in secular stagnation, and per capita incomes across the world, including in many advanced countries, have continued to rise at a moderate pace, albeit a disappointing and far slower pace than before.

However, could we be headed towards even worse outcomes? In a recent report, the OECD Secretariat has analyzed the causes of slowdown in global growth in recent years. The OECD[6] finds that using the broadest measures of productivity, global productivity was buoyant in the ten years or so prior to the crisis, despite a moderate slowdown in advanced countries, because of strong advances in developing countries. However, since the outbreak of the global financial crisis, broad measures of productivity growth have fallen very sharply across the world, and have been close to zero in recent years. Despite the crisis, in developing countries, unlike in advanced countries, investment rates remained high by historical standards, so labor productivity – as distinct from the broadest measures of productivity, which account for capital input - continued to advance quite rapidly. GDP growth in developing countries remained rapid until around mid-2013, but was mainly accounted for by increased factor intensity, i.e. increased inputs of labor and capital, instead of by improved efficiency, giving rise to concerns that it may not be sustainable

(4). Data for calculations is based from the World Bank's WDI Database. World real GDP growth at purchasing power parity (PPP) rates from 1990-2006 averages 3.52% and 3.11% after the crisis. Data of real GDP at PPP exchange rate is only available from 1990.
(5). Maddison, 1982
(6). OECD,2015.

and subject to declining marginal returns.

Chart 1 : Growth in multi-factor productivity

Note: Multi-factor productivity (MFP) growth measures the growth of GDP over the combined contributions of total hours, workforce skills, machinery and structures and ICT capital. Emerging market and developing countries include China, India, and other developing Asia economies, Latin America, Middle East, and North Africa, Sub-Saharan Africa, Russia, Central Asia and Southeast productivity and MFP growth, but the main trends remain the same.

Source: OECD calculations based on the Conference Board Total Economy Database

However, does the sharp slowdown in broad measures of productivity signal secular stagnation, or does it, as argued by Carmen Reinhart and Ken Rogoff in their timely and prescient book "This time it's different" (2008),[7] a drawn-out but temporary phenomenon as the economy deleverages and restructures in the wake of a major financial crisis? After all, the world economy has clearly still not fully recovered from the global financial crisis. In the United States, where the crisis originated, moderate growth has resumed and households, banks and corporations have rebuilt their balance sheets, but the legacy of high government debt and a hugely expanded monetary base remains. The likely effect of correcting those imbalances on America's future remains a hot subject of debate. Moreover, America's Great Recession was followed by very severe aftershocks in the rest of the world, whose effects are also far from resolved. China's massive fiscal and monetary stimulus in 2009-10 in response to the global crisis, and the country's ensuing boom followed by a very sharp slowdown remains a prominent feature of the current conjuncture. So is the collapse of commodity prices subsequent to China's slowdown. And so is the large-scale withdrawal of capital from developing countries following a massive inflow of capital to them as international interest rates fell to zero. The long drawn-out troubles of the Eurozone reflect fundamental weaknesses in the construct of the Euro, but the Great Recession in the United States acted as a trigger, and the Eurozone sovereign debt crisis is still very much with us. The subprime mortgage debacle in the United States was certainly not the main cause of all these problems, but it did uncover deep fault lines and also created the need for policy responses across the world, some of which had serious and far-ranging unintended consequences.

So today all three giant economies, American, Eurozone, and Chinese remain, in their different ways, all far from a steady state equilibrium, and that means that uncertainty prevails more than it usually does, and the world economy remains vulnerable to any number of potential shocks.

(7). Reinhart and Rogoff, 2008.

Yet if the implication is that growth has slowed only temporarily, and will resume to its previous pace once we free ourselves from the quick sands of the global financial crisis, at least we are dealing with the devil we know. The need for a counter-cyclical fiscal and monetary response, for deleveraging of households, governments and banks, and for reforms of the financial sector – all this is familiar territory by now. Albeit with a lag with respect to the United States, nearly all advanced countries are undertaking these measures and slowly making progress in emerging from the crisis, and China appears to have the instruments to overcome its current troubles.

However, if the problem we face is instead slow growth over the lifetime of our children, then these responses are not enough and the ballgame is very different. Growth rates that are 0.5 percentage -0.75 percentage durably lower, as seen in the post-crisis period, may not seem like much but they compound into much lower living standards over time and can trigger a vicious cycle of diminished expectations. In advanced countries, investment rates have declined as growth has slowed and, in part, because investment goods have a large import component, global trade has also decelerated sharply[8]. Less capital accumulation implies lower capacity to produce in the future, and since investment and trade are among the principal drivers of efficiency and innovation, their deceleration is also likely to result in slower long-term productivity growth. Slower growth comes with low inflation, currently bordering on deflation in many advanced countries. The consequent sluggish growth of nominal wages, profits and of government revenues has raised the burden of servicing debts incurred in years past, when inflation and interest rates were much higher. In instances where these legacy debts were already too high to start with, as in Italy and Japan, for example, low inflation compounds the pressure to tighten belts, and, without growth, this pressure will remain over decades to come.

In a much lower growth long-term scenario, households must prepare to earn less over their lifetime, and so have to save a larger share of their incomes to carry them through retirement, especially as they are likely to live longer. Over a working life of 40 years, 0.5% less income growth a year results in 22% less income at the date of retirement. Corporations as well as governments must revise their investment plans substantially downwards. Persistently slower growth means that governments have to prepare to increase taxes to cover pensions and health-care costs, under schemes that were established when growth was assumed faster and people died earlier. As one can attest based on the nightly news, slower growth would also likely be accompanied by an increase in internal and international frictions, making collective decision making more difficult, and creating the need for spending on policing and defense to rise.

Therefore, there is plenty of reason to worry. However, why would long-term growth be much lower than in the past?

The Argument for Secular Stagnation

Persistent slow growth can be the result of a chronic shortage of demand or by the failure of supply to grow. A chronic shortage of demand can be the result of persistently diminished expectations, a decline in the population, or high and unsustainable levels of debt, which force belt tightening by governments or households. A chronic shortage of demand can also be the result of high and rising inequality, which reduces the ability of the vast majority of the population to consume and raises the savings rates. Economists know, however, that demand shortages are often temporary, the reflection of what Keynes called “animal spirits”, and so they tend to think of long-term

(8). Dadush, OCPPC Trade Policy Brief 2015.

growth as being influenced mainly by supply factors. For example, the World Bank's projections of long-term growth and its analysis of past growth episode over long periods invariably focus on the supply rather than the demand side of the economy, while the IMF's analysis of current growth and it is projections for the next year nearly always focus on the demand side of the economy. Supply side detriments to growth can include slower growth of the labor force, reduced investment in human and physical capital, and, most importantly, lower productivity, which can reflect forces as diverse as a decline in innovation and red tape or other government impediments to the working of markets. In different contexts and at different times, each of these possible forces – both those on the demand and on the supply side of the economy - have been cited in support of the secular stagnation hypothesis. In the not too distant past, the believers in secular stagnation found their inspiration mainly in poor agrarian economies (remember Malthus and the "Malthusian trap"?) but more recently in the advanced countries (remember the "Club of Rome"?). In the present era, Japan became exhibit 1 for the secular stagnation hypothesis. Japan had been a star booming economy, but saw a massive growth deceleration in the wake of its banking bust at the end of the 1980's and continues to struggle against slow growth and deflation today. Italy, which has been in the throes of a sovereign debt and competitiveness crisis, has seen essentially no advance in productivity over the last 20 years. Much of the debate over secular stagnation has focused even more recently on the United States, even though it has recovered faster from the crisis than other advanced countries.

In what follows, I will not limit my examination of secular stagnation to Japan, Italy or the United States, but instead will widen the scope of the discussion to consider the implications for the whole world. This optic is needed not only because we live in a highly integrated global economy, but also because much can be learnt about the likelihood of secular stagnation by examining different country circumstances. Using this wider lens, I will examine each of the arguments for secular stagnation in turn in this and the next section. I will conclude that there is some merit in each of the arguments in support of secular stagnation, but that their relevance varies greatly across countries. Moreover, only demographic factors can be said with any confidence to account for significantly slower global GDP growth in the future. In addition, slower GDP growth need not mean slower per capita income growth, which is what matters for living standards. I will temper this rather optimistic assessment a bit by noting that the extraordinarily rapid growth of China and many other developing countries observed over the last generation has been boosted by the transition from central planning to the market economy and that this process is now approaching its end.

Chronic Demand Shortage This argument, associated mainly with Lawrence Summers[9], posits that the advanced countries are held back by a combination of shifts in technology, demographics, and income distribution, as well as an overhang of debt, which -combined with low confidence - are restraining demand. With confidence depressed, savings rates have increased and exceed investment, and, with policy interest rates near zero, there is little more that monetary policy can do to boost demand. Meanwhile, the threat of deflation looms. Summers argues that the best way to redress the economy is to increase government spending on infrastructure, borrowing at the current very low interest rates and using up the underutilized human and physical capital to boost both demand and the capacity of the economy to produce in the future. I agree with Summers' policy prescription but not with his diagnosis. Infrastructure spending is, as Summers argues, the appropriate counter-cyclical measure where the fiscal space exists. Recovery in the United States would almost certainly be faster and more sustainable with increased infrastructure spending,

(9). Larry Summers, March/April 2016.

but, even absent that stimulus, the United States has not and is unlikely to lapse into secular stagnation. Over the three years from 2013 to 2015, the United States added 8 million jobs. Employment is currently 5 million higher than it reached at the prerecession peak in January 2008, and the unemployment rate is now at 4.7%, back at the pre-recession level and near or below most estimates of the unemployment rate at which inflation accelerates. Moreover, the structural shortage of demand argument clearly does not apply in the case of several advanced countries, which have avoided the worst effects of the crisis (Australia, Canada, Singapore, Sweden and Switzerland among others). Nor does it apply in the vast majority of developing countries[10]: a large part of their population still lacks access to reliable electricity, clean water, and sanitation, and the vast majority lacks access to cars and air conditioning, yet – judging by numerous indicators of economic and policy performance, such as openness, macroeconomic stability, credit ratings, and quality of the business environment - is gradually improving its capacity to afford these goods and services. This process of improved governance, which Summers has recently described as "the march of reason"[11], has enabled developing countries to already account for the lion's share of world growth. Even in 2014 and 2015, which – as already indicates - were weak growth years for developing countries, the largest among them, including China, India and Indonesia, home to around 2.5 billion people grew at rates in excess of 5%. A collection of some 80 countries, classified as low-income developing countries by the IMF, and home to close to a billion people, also grew at rates in excess of 5%. Underscoring the rather more buoyant demand conditions in developing countries, while inflation remains very subdued in several advanced countries, it has accelerated in developing countries in recent years.

Increased Inequality. Increased inequality can dampen growth in at least three ways: by containing demand, since the propensity to consume of the poor is likely to be higher than that of the rich; by tilting the playing field and reducing the opportunity of the poor and of their children to receive education and to avail themselves of good job opportunities; and by increasing social frictions, crime, and deepening political divisions[12][13]. Increasing inequality is indeed a big problem, notably in the United States, which has become the most unequal advanced country. However, high and rising inequality is not a new phenomenon[14] and nor is the trend universal, as many countries have seen only small changes in inequality in past decades. For example, the argument that the poor lack access to good education clearly carries force in the United States, where more youth are dropping out of high school and college than in the past. However, it has little bearing on many advanced countries where high school and college completion rates are still rising, and even less in developing countries where college enrollments are advancing rapidly. More generally, inequality across the world's citizens has likely declined as poor countries have grown faster than rich countries. In poor countries, increased inequality is often the natural accompaniment of faster economic growth and is necessary, for example, to incentivize people to move from the countryside to the cities. The available research on the effects of inequality on growth does not always agree, but most recent research suggests that the effect on long-term growth of high inequality is negative and significant[15]. However, while very high and rapidly rising inequality may affect growth prospects of individual countries, given the diversity of inequality outcomes across countries, these effects are unlikely to be large enough to account for a significant slowdown in the global growth rate.

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(10). Summers' argument is intended, I believe, to describe the situation of most large advanced countries and not to apply more broadly.
(11). Summers, May/June 2016.
(12). Dadush and Dervis, 2012.
(13). Robert Gordon, 2016.
(14). Piketty, 2014.
(15). IMF Working Paper, 2015.

Increased Government Debt. Increased government debt burdens can stymie future growth in the future, as they can force cuts in public investment spending on infrastructure and education, for example, and, combining with the effects of an aging population – discussed below – force tax increases which will dull worker incentives, reduce the return to private investment, and restrain aggregate demand. High debts can also adversely affect investor confidence. Reinhart and Rogoff conclude in a paper, which examines the link between government debt and growth[16], that growth slows when government debt is above a threshold, which they suggest is 90% of GDP. Above that level, a 60 % increase in external debt as a share of GDP is associated with 2% less growth. Gordon examines in some detail the increase in debt of the United States over the recent period and places high government debt high on the list of factors that are likely to depress US economic growth over the next 15 years[17]. There is little doubt that very high government debt is having growth-depressing effects in countries such as Japan, Italy, and Greece, the three most indebted OECD countries. However, very high and rising government debt ratios are not a universal phenomenon. While, from 2009 to 2015, the gross government debt to GDP ratio has increased from 92% to 106% in advanced countries, that of developing countries has increased far less from a much lower level, from 40% to 45%[18]. As always, these averages conceal a wide diversity of outcomes, with countries such as Brazil having much higher ratios. However, debt levels in most developing countries remain well below the danger thresholds identified by the available literature. Overall, while growth in several advanced countries is almost certain to be dampened by high levels of public debt, the picture of developing countries looks far less dire. Demographic trends, to which we turn, reinforce this conclusion.

Demographics

Slowing growth of the labor force – or more precisely of people of working age - is the most obvious and direct way that demographic trends can adversely affect economic growth. However, trends in the people of working age are affecting countries very differently. Countries that are well advanced in their demographic transition (falling birth and death rates) are seeing a sharp decline in the rate of growth of the labor force, and, indeed an absolute decline. Other countries, early in their demographic transition are seeing a bulge in their labor force. The United Nations projects that in the years to 2050 all of the growth in the number of people of working age, some 1 billion, will occur in developing countries, mainly in Africa, while that cohort will decline in advanced countries. Overall, growth of the global labor force has slowed sharply from 1.8% in 1960-2005 to 1.1% since 2005[19] and is likely to slow further in coming decades, a result of sharply slowing population growth and a falling share of people of working age in the total population.

Shifts in dependency ratios can augment or diminish the effects of slowing growth of the labor force on economic growth. Typically, early in the demographic transition, dependency ratios – the ratio of children and old people to the labor force – decline, whereas late in the demographic transition the ratio of old people to the labor force rises whereas the ratio of children to the labor force tends to stabilize or decline gradually. Rising dependency ratios – the case of advanced countries - often mean that more resources must be dedicated to supporting old people, government finances tend to bear a higher burden of health and pension costs, and less is available for investment. The opposite is true when the dependency ratio is declining, which is still the case in developing countries in Africa. For example, while the share of the population of working age (15-59) in the

(16). Reinhart and Rogoff, 2008.
(17). Robert Gordon, 2016.
(18). IMF, January 2016.
(19). Ruchir Sharma, March-April 2016.

total population will decline in the United States from 60% in 2015 to 55% in 2050, in Zambia it will increase from 50% to 56%, and from 53% to 64% in Ethiopia, while Zambia's and Ethiopia's population will grow much faster than in the United States. There are also big differences among developing countries. For example, the share of the population of working age will decline very sharply in China, from 68% in 2015 to 50% in 2050, but remain relatively unchanged, near 62%, in India, one reason that India may well become the world's fastest growing large economy[20]. Thus, on the face of it, demographic trends remain supportive of continued or even faster growth in many developing countries but not in advanced countries, nor in China, which is seeing the effects of its one-child policy. However, this interpretation must be heavily qualified since much depends on what how countries deal with their changing demographics. For example, developing countries which have a good investment climate and are effective in educating their young, can draw large benefits from their burgeoning labor force, the so-called "demographic dividend" but those that do not fulfill these conditions can end up with large youth unemployment as is the case in Egypt and many other countries of the Middle East North Africa today. Similarly, advanced countries, which have a good investment climate, educate their young effectively, allow increased immigration and provide incentives for old people to continue working, can significantly mitigate the effects of demographics on growth.

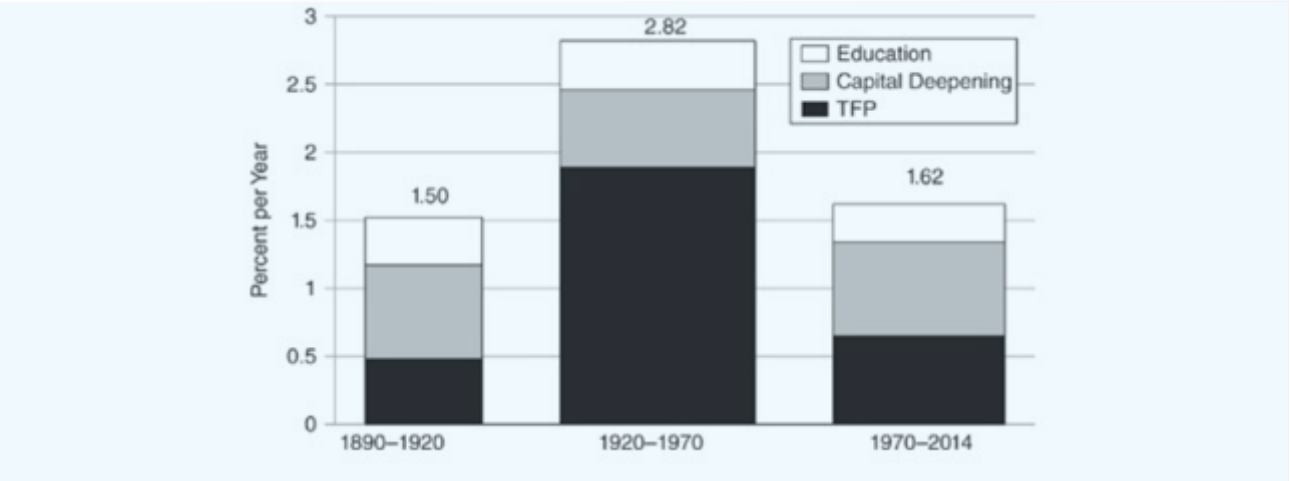
Finally, it is important to stress that slowing populations need not result in declining incomes per capita even if GDP slows. Slowing growth of the labor force and rising dependency ratios may result, on the other hand, in lower growth of income per capita. However, these forces may be offset to some degree by using labor more efficiently. This takes us to the central issue of productivity growth. Of the many arguments put forward in favor of the secular stagnation, none has drawn more attention than the decline of innovation and of productivity growth. The considerable controversy surrounding this thesis is reviewed in the next section.

Productivity Slowdown and Innovation

The argument that productivity is slowing principally because of slower innovation is most closely associated with Robert Gordon of North-Western University. Gordon's thesis long held and now comprehensively set out in a highly readable and informative new book "The Rise and Fall of American Economic Growth" draws almost exclusively on evidence from the United States, the world's largest and most technically advanced economy. He shows how the standard of living of Americans and their life expectancy have been transformed since 1870, at the dawn of great inventions, namely electricity, the combustion engine, the telephone, and antibiotics, and when the access to the telegraph, the railroads, as well as clean water and sanitation was still limited to the few. Gordon documents the remarkable acceleration of U.S. labor productivity growth that followed, and which intensified during 1920-1970 to reach 2.8% a year due to the cumulative effects of the great innovations (chart 2). He also shows that labor productivity growth has slowed markedly since 1970, to around 1.6% and attributes the slowdown to the fading effect of the great inventions of the past. Gordon argues that Information and Communication Technologies (ICT), the main innovation of recent decades, has only a narrow effect on productivity compared to the great inventions of the past

(20). UNDESA, 2015.

Chart 2: Average annual growth rates of output per hour and its components, selected intervals, 1980-2014



Source: Gordon, The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War

Gordon supports his case with extensive statistical evidence and anecdotes. However, his claim that modern-day innovation does not stack up against that of the past is strongly contested by a large tribe of "techno-optimists". This group of prominent academics, management consultants and business executives, either mistrust the available aggregate statistics of productivity, which point to a large slowdown in recent years (see box), or believe that ICT is still young and evolving and that other important innovations are in the pipeline, so the recent past is not a good guide to their future potential. Like other transformational inventions, many argue, it will take many decades for production to be reorganized in ways that take full advantage of ICT. In the view of the likes of Brynjolfsson and Mc Afee[21] and many others, the cumulative effects of recent innovations, such as artificial intelligence, the smart phone, nano-technology, 3D printing, self-driving cars, drones, on-line retailing, the internet of things, and robotics, may turn out to be so far-reaching that tens of millions of blue and white collar workers in the United States alone, will be replaced by machines or be outsourced to other countries where the cost of labor is lower. According to Alan Blinder these new technologies, combined with freer international trade and investment, could enable the outsourcing of between 22% and 29% of American jobs[22] – enabling a more efficient but also highly disruptive international division of labor. Meanwhile, the techno-optimists argue that medical advances such as genetic engineering, microsurgery, and immunotherapy treatment of cancer will boost the quality of life and life expectancy of Americans.

(21). The Second Machine Age, 2014
(22). Blinder "how Many U.S. Jobs Might Be Offshorable?" , 2007

Box: Problems in the Measurement of Productivity and Innovation

Economists are often tempted or obligated to reduce the measurement of immensely complex phenomena, such as the economy's output, inflation or the income distribution to one number, and this is often a cause of many problems and misunderstandings. In the case of economy-wide productivity, the chosen number is Total Factor Productivity (TFP), intended to provide a composite measure of the productivity of all the factors of production, including labor, land and capital. Few measures in economics are more important than TFP, since empirical estimates usually conclude that economies grow rapidly by mainly by boosting TFP, and that the accumulation of capital, labor and land tend to play a secondary role. What TFP is intended to measure is conceptually clear, and indeed TFP can be expressed mathematically in precise terms. However, in the real world, TFP cannot be measured directly like the average height of 50-year-old males; it can only be estimated using various econometric techniques. As it turns out, the available estimates of TFP as a measure of economy-wide productivity are imprecise, subject to numerous measurement errors, and open to many different interpretations due to these estimation difficulties.

TFP of an economy is measured as the residual of a regression of aggregate GDP growth against the growth of capital, labor and land inputs, and because it is only a residual, TFP has often been described as a "measure of our ignorance" . In fact, while the residual may represent innovation and improved management techniques, it may also include errors in measuring output and the production factors, or it may reflect temporary cyclical influences, or all of the above. TFP tends to be strongly pro-cyclical, declining in recessions and rising in recoveries. Estimated TFP may fail to capture adequately innovation because innovation is incorporated in more advanced machines, or in better-educated and more skilled labor. Though econometric techniques have been developed to try to get around many of these problems, they are imperfect, so a wide range of plausible estimates of TFP can result. Economists sometimes prefer to resort to simpler and easier to calculate measures of productivity, such as output per hour worked, which is a measure of labor productivity. However, this measure, too, behaves pro-cyclically, and – as a measure of innovation – has the crucial shortcoming of failing to account for the effect of increased use of machines.

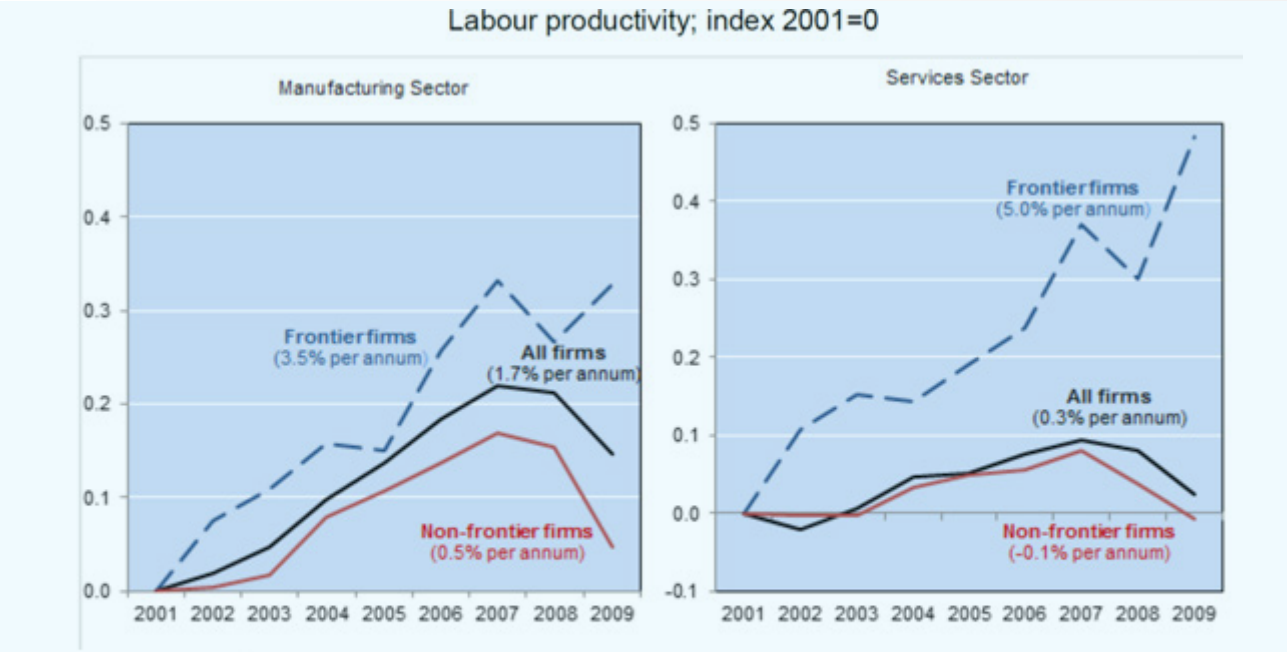
The use of TFP as a direct or indirect measure of innovation at the frontier – or of entirely new techniques that boost productivity - is especially problematic. Increased TFP in a given year is much more likely to be the result of replication and extension of previous innovations rather than from the application of entirely new discoveries. Therefore, a deceleration of TFP in a given year or even over a long span of years could easily to reflect reduced incentives and capacity to extend previous discoveries (for example, due to a protracted recession) rather than a lapse in new discoveries. Underscoring the difficulty of accurately measuring innovation-using TFP, innovation is not only a determinant of factor productivity but is also a determinant of factor accumulation. Without innovation, there may be no factor accumulation in the first place. For example, before the introduction of agriculture, growth of the population and of the labor force was severely limited by the supply of food. Without the computer, there would be no incentive to invest in a degree in computer science, or in Silicon Valley start-ups, etc. For these reasons, the attempt to separate the effect on growth of innovation from the growth of factors of production is conceptually suspect as well as empirically difficult.

Finally yet importantly, TFP is an imperfect measure of innovation because GDP, the numerator in the TFP calculations, fails to measure properly the effect of innovation on output and on living standards . GDP estimates are based on market prices and the evolution of GDP in real terms require inflation adjustment. This creates at least two major challenges in measuring GDP, which appear to be especially acute today in the midst of the IT revolution and the steadily rising importance of services. First, many of the benefits IT accrue at near zero marginal cost, and so are available nearly free, yet they displace bricks and mortar activities that generated much value added in the past (think of Amazon replacing shops, Netflix replacing cinemas, Google replacing armies of research assistants, Word replacing secretaries, iPhones replacing cameras and Spotify replacing CDs, etc.). Second, much of the new value added in the modern economy consists of providing more services and improved quality of services as well as goods, and price comparisons that attempt to measure the evolution of quality over time are either avoided altogether or very difficult to conduct accurately. These difficulties very likely result in underestimation of GDP as it is traditionally measured and, therefore, of TFP.

Techno-optimists also stress that many of the consumer applications brought on by ICT are relatively inexpensive to apply and spread, contributing to large and almost immediate welfare gains that cannot be measured adequately using market prices. The low marginal cost of the cell phone, the smart phone, notebooks and the internet, has enabled this "consumer surplus" to accrue worldwide in the flash of an eye compared to the time and cost it took for consumers to access the benefits of electricity, sanitation, and the automobile.

Who is right, the "stagnationists" or the techno-optimists? Is the observed slowdown in productivity mainly a result of measurement errors or of the still-unwinding global financial crisis, or is it due to a secular slowdown in innovation and investment? An important piece of evidence that favors the techno-optimists emerged recently and is found in the aforementioned OECD study. It shows that, prior to the crisis, innovation did not slow in vast numbers of firms that operate at the frontier. As chart 3 shows, frontier firms, defined as the top 100 most productive firms across the world in each 2-digit sector, grew labor productivity at very rapid rates, 3.5% a year in manufacturing and 5% a year in services over 2001-09, whereas non-frontier firms (which are 4 or 5 times less productive than frontier firms) saw little or no productivity growth. Moreover, there is little sign of a productivity slowdown among frontier firms after 2004, the year when productivity began to slow sharply in the United States. However, not only did firms not at the frontier struggle to fill the large gap in performance with frontier firms, their productivity remained stagnant over the period. One can speculate what caused such large divergence in performance between global frontier and non-frontier firms, but, whatever the cause, it was not – prior to the crisis - a slowdown in innovation in the 100 firms that had achieved the state of the art in each sector.

Chart 3: Solid growth at the global productivity frontier but spillovers have slowed down



Notes: "Frontier firms" corresponds to the average labour productivity of the 100 globally most productive firms in each 2-digit sector in ORBIS. "Non-frontier firms" is the average of all other firms. "All firms" is the sector total from the OECD STAN database. The average annual growth rate in labour productivity over the period 2001-2009 for each grouping of firms is shown in parentheses. The broad patterns depicted in this figure are robust to: *i*) using different measures of productivity (e.g. MFP); *ii*) following a fixed group of frontier firms over time; and *iii*) excluding firms that are part of a multi-national group (i.e. headquarters or subsidiaries) where profit-shifting activity may be relevant.

Source: Andrews, Criscuolo and Gal (2015).

Both the advocates and opponents of the secular stagnation hypothesis are prone to take unequivocal positions. However, there is no definitive "proof". The future may show that both views are partly right – there can be more or less innovation and more or less growth, and the answer may differ not only across countries but also, as Chart 3 shows, across firms in the same sector. Still, it must be said that Gordon's dire predictions about the slowdown in innovation are especially audacious, since continuous innovation has characterized the economic history of the last 250 years, are visible in the performance of the leading firms right up to the eve of the crisis. Moreover, we know that innovations tend to be cumulative, with prior innovations enabling yet more innovations. No one – neither the pessimist nor the optimist - can know for sure what the technological future holds since new inventions have, by definition, not been invented.

Implications for Developing Countries

As we have seen, innovation gives rise to many measurement problems and ICT is especially problematic in this regard since it tends to replace large parts of traditional value added with services that are delivered at very low marginal cost. Moreover, it is difficult to untangle the effects on economic growth and of productivity of secular forces from that of the crisis. With the exception of slowing and aging population, the arguments made in support of secular stagnation in the advanced countries remain speculative. Still, if the sharp slowdown in the growth of advanced countries were to prove persistent, there will be less opportunity for developing countries to specialize in goods and services that advanced countries need to import. In addition, slowing innovation at the frontier – if true - will eventually reduce the ability of developing countries to import new and exciting products and limit their growth opportunities as well. Even so, the slowdown of productivity growth at the frontier of technology is likely to have little bearing on the near- and medium- term growth prospects of developing countries that, with few exceptions,

operate far within the technological frontier. In countries where large parts of the population are still stuck in low- productivity activities or subsistence agriculture what matters most is not the latest contraption or technique. Instead, it is the rate at which they take advantage of electricity, the car, sanitation, the computer, and the internet that is crucial. Given the very large divergences in productivity between frontier firms and lagging firms (Chart 3), there is also much more that can be done both in advanced and in developing countries to bring large parts of the economy to the state of the art, even if innovation at the frontier slows.

Indeed, even if one agrees with Gordon's gloomy predictions about innovation at the frontier, his account of how the inventions of past generations transformed living standards in the United States makes for a highly convincing case in favor of rapid continued growth in the developing countries of today. The surge in labor productivity in the United States, which began around 1920, occurred when the nation's GDP per capita was around $5000 in today's prices adjusted for purchasing power, similar to that of Morocco and other lower-middle-income countries today. Although the next 50 years included the Great Depression and World War 2, they saw labor productivity in the United States grow at close to 3% a year (near, by the way, to the rate registered by developing countries since 2000). Gordon refers to this period as "the great leap forward", and as a "miracle". To explain the surge in productivity, he cites large investments in education, improvements in the quality of capital goods, a pro-wage and pro-worker institutional environment, and urbanization. Most importantly, he cites transformative technologies, notably electricity and the combustion engine, and what he calls "sub-inventions" such as aircraft, the elevator and air conditioning. He also cites critical improvements in health due to sanitation, clean water, and new medicines such as antibiotics. These innovations and many more (the computer, the internet and the cell-phone) are still spreading rapidly in developing countries today. As was the case of the United States of the 1920's, their effect is very far from spent. All this gives ground for some optimism about growth in advanced countries as well. Since developing countries now account for around 85% of the world's population and for close to one-third of world GDP at market exchange rates, their continued rapid growth will provide both advanced and developing countries with a large pool of demand, as well as opportunities for increased specialization in higher value added products, even if technological innovation at the frontier slows.

The slowdown in technology at the frontier – if, indeed, it is real – is unlikely to stifle growth in developing countries in the foreseeable future. What about the other forces cited in support of secular stagnation in advanced countries? As discussed previously, demographic trends across the developing world are very diverse. The poorest developing countries are still in the early stages of demographic transition, with a bulge of young workers entering the labor force and their old age dependency ratios remain very low. However, overall, both the population and labor force growth rates are declining in many middle-income countries, which account for the bulk of developing country GDP, so overall, demographic trends are likely to mean slower aggregate GDP growth in developing countries as well. However, this may not affect the growth of income per capita nearly as much as aggregate GDP; indeed, in some instances – such as in high-population/low-resource economies – it may accelerate per capita income. Summers' concerns about chronic demand shortage in advanced countries has little bearing on developing countries, and his fears may turn out to be misplaced in advanced countries as well. The worry about rising government debt and its effects on growth is primarily an issue that several advanced countries have to confront at this stage, while the situation in nearly all developing countries is far less dire. Similarly, concerns about the effects of rising inequality on growth in developing countries, because rising inequality in China and India, for example, has been accompanied by rapidly rising average and median wages, in contrast to the United States, for example.

The End of Transition: An Overlooked Aspect of Slower Growth

Before concluding, I will consider an overlooked cause of potentially slower global growth, which originates in developing countries. This is the end of transition of China and of other formerly planned economies to the market system. The significance of this process for world economic growth is likely to be considerable, but it is not a reflection of secular stagnation, rather the end, in parts of the world, of an exceptional period. It is worth noting, without a claim to causality, that when the transition process was in full swing and China was growing at extremely rapid rates, as in the late 1990s and early 2000s, world trade boomed. World trade has slowed dramatically because of the global financial crisis, but the end of transition may also have played a role[23].

The fall of the Berlin Wall in November 1989 is often taken to mark the start of transition towards the market economy of communist countries. In reality, however, in several countries the process began long before this date, while in others transition started much later. In some countries, such as Cuba, Laos, Myanmar and Vietnam, it is still ongoing or just starting, and in at least one case, North Korea, it has not yet begun. Invariably, severe disruption, large-scale restructuring and often, recession have marked the first several years of transition, and the benefits of transition took a long time to materialize. Furthermore, market reforms took place in a much broader set of countries than the centrally planned economies narrowly defined. It involved many non-communist but highly protected economies such as India, for example. In fact, across the world, market friendly reforms – such as those advocated in the 1980s by Ronald Reagan and Margaret Thatcher – gained traction over the 1990s and 2000s, and the process of transition was not only an outgrowth of this movement, but, as previously planned economies began to do well, served to reinforce it. The precise measurement of the effects of transition on global economic growth is likely to be elusive, and is beyond the scope of this brief. What can be said with some confidence is that the process had far-reaching effects and that it took longer than a generation: its effects on growth began to be felt in the mid-1980s, after market reforms in many developing and advanced countries accelerated, and began to wane only recently. By the start of the second decade of the 21st century, there had already been a large scale reduction in the role of the state in many countries, tariffs and other forms of protection had come down, and China was well on its way to becoming the world's largest exporter. One example of the importance of the process can be drawn from the 30 or so countries in transition, which joined the WTO after its establishment in 1995. As a recent World Bank analysis has shown, this group grew faster than WTO incumbents grow, saw higher rates of investment, and significantly increased their share in world export markets. These results remain even if China is excluded from the sample of countries in transition.[24]

As the effects of transition wane, the effects on growth are likely to be most pronounced in China, now the world's largest economy (based on purchasing power) and the country where transition -though not yet complete - was most far-reaching and successful. It is worth noting that, while in recent years the GDP of the United States has decelerated by 0.5% compared to its average over the last 25 years, China's deceleration as transition matured has been much sharper, by roughly 3.5 percentage points. Some 30 other formerly planned economies, including East European economies that have joined or are in the process of joining the European Union, are also very advanced in transition. Given its size, China's deceleration alone will have a sizeable arithmetic effect on the developing country average (a reduction of China's growth from 10% to 6% a year arithmetically reduces the developing country average growth rate by over 1%),

(23). Dadush, Should we worry about the Trade Slowdown? Policy Brief, OCP Policy Center (2015).
(24). See "WTO Accesssions and Trade Multilateralism" U. Dadush and C. Osakwe Editors, especially chapter bya Mona Haddad et al.

and will also reduce the opportunities for other developing countries, especially commodity exporters, to specialize in their area of comparative advantage.

Conclusions and Policy Considerations

Both advanced and developing countries are likely to grow less rapidly in coming decades than during the pre-crisis period. Slowing population growth will slow headline GDP growth in advanced countries, China and several other middle-income developing countries, but it will not necessarily slow the advance of per capita incomes. The youth surge in many developing countries will provide a significant boost to growth in those that can take advantage of their "demographic dividend", while rising dependency ratios will likely depress growth in advanced countries.

The case for secular stagnation based on slowing technological advance in rich countries remains unproven, and nothing resembling a secular stagnation scenario due to technology appears plausible in developing countries at this point, on the contrary, the technological revolution in many developing countries is still in its infancy. However, the end of transition means that the growth rate of many formerly planned economies is bound to slow.

Under any scenario, much will depend on the capacity of developing countries to use up the large existing reservoir of technical innovation, which, as is indicated by their very low productivity levels compared to those of advanced economies, they are far from exploiting. This assessment of the growth prospects of developing countries may appear sanguine against the background of their present slowdown, not to mention the crises in economies from Brazil to Russia, but it is based on considerations relating to growth fundamentals rather than on the cyclical or political cycle. The assessment broadly holds whether or not innovation at the frontier remains high. Obviously, if innovation at the frontier remains as vibrant as over the last 250 years, which I believe is the most likely outcome, and productivity of advanced countries continues to grow at robust rates, all the better.

There are some straightforward policy implications for developing countries stemming from this analysis.

First, developing countries, especially those relying on China, as well as those whose trade is closely tied to advanced countries (e.g. Mexico with the United States, Morocco with Europe) should prepare for somewhat slower growth – though not stagnation - of their overseas markets. In the many instances where population growth is slowing sharply, developing countries should also prepare for slower growth in their domestic markets. However, assuming a supportive domestic policy environment, per capita income growth rates in developing countries should remain high, especially in instances where there is a "youth bulge", as is the case of most of Africa, even as overall population growth is slowing. Slower export growth combined with continued growth of incomes per capita could spell balance of payments problems for countries that maintain overvalued exchange rates or which engage in large-scale borrowing in foreign currency. Projections of tax revenue also need to be adjusted downwards. Developing countries such as China where the demographic transition is very advanced, will confront an especially sharp dilemma as provisions for health-care and pensions must be raised while the growth of tax revenues slows. Developing countries would do well to learn from the mistakes of advanced countries, many of which failed to anticipate the demographic transition and overcommitted to

entitlement programs.

Second, the slowdown in China is likely to affect developing countries differently. As China's producers focus more on their domestic markets, and as their costs rise, new opportunities will open up in manufactures, in countries from Vietnam to India to Mexico. Commodity exporters will see some decline in total demand as a result of the slowdown in China, the world's largest importer of many commodities, the slowdown in advanced countries, and because of slowing global population growth. However, new export opportunities may arise in parts of the world, such as Africa, the Middle East, and parts of Asia, where population growth remains quite rapid, the production of manufactures may remain buoyant, and governance and other reforms may take a firmer hold.

Third, growth of developing countries will, as in the past, depend much more on their ability to adopt existing technologies than on new inventions. Adopting existing technologies effectively depends, above all, on the quality of their domestic policies, the ability of their institutions to foster a transition to higher value added activities, and on the utilization of their hugely unexploited human potential. I summarize the conditions that will determine rapid growth as the four Cs[25]: connectivity, competence, cost and confidence. Connectivity includes openness and a viable transport, communications and internet infrastructure, necessary for goods and ideas to flow freely. Competence includes a good quality education system. Cost includes a realistic exchange rate and avoidance of red tape. Confidence – which is an absolutely necessary condition - includes political and macroeconomic stability as well as secure property rights.

Those who think that the global economy is headed towards somewhat slower long-term growth are almost certainly right. Those who believe we face secular stagnation are almost certainly wrong, and are also far off the mark in their assessment of the long-term prospects of developing countries. Technological innovation at the frontier and rising world demand can help everyone, but under any plausible scenario – with or without secular stagnation in advanced countries – development, or its absence, will continue to be made at home.

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OCP Policy Center

Ryad Business Center – South 4th Floor – Mahaj Erryad - Rabat Morocco

Website: www.ocppc.ma

Email: contact@ocppc.ma

Phone: +212 5 37 27 08 08

Fax: +212 5 37 71 31 54

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