

Intelligence MEMOS



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To: Economy Observers

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Re: **THE EROSION OF NATURAL CAPITAL AND DECLINING PRODUCTIVITY GROWTH**

As we [discussed](#) yesterday, labour productivity and multifactor productivity (MFP) growth rates have been declining in advanced economies for several decades, and the decline in labour productivity growth has now extended to emerging economies.

While many explanations for these trends have been advanced, no clear consensus has emerged. The persistent nature of these declines signals that factors of global scope and extended duration are driving this result.

A recent research [paper](#) by one of us presents a new common-sense explanation for declining productivity growth: Natural capital erosion, including the impact of climate change, has exerted significant and growing downward pressure on global productivity growth, Canada included.

The UN defines natural capital as the stocks of environmental assets (including natural resources, ecosystems and a stable climate) that generate flows of goods and services into the economy. Economies are deeply inter-linked with natural systems and rely extensively on inputs of natural resources – even if conventional economic analysis has often ignored this, or assumes that resources are infinite and often free.

Production – and hence productivity – clearly relies heavily on natural systems and resources. To produce goods to support human activities, a vast array of natural capital inputs are used. For example, agriculture needs arable soil, seeds, rainfall and fertilizer; manufacturing requires energy, metals and minerals; and construction needs timber, stone, sand and cement.

Ecosystem services, including a stable and predictable climate with minimal extreme weather, provide an essential foundation for most economic activities. Recent research determined that more than half (55 percent) of global GDP is generated by industries that are completely, highly or moderately dependent on nature. Even sectors with less direct dependence on nature, such as professional services, show significant indirect dependencies through supply chains.

How are natural capital and productivity connected? Expanding access to and use of natural capital was a key driver of productivity growth for at least three centuries prior to the mid-20th century. Increasing travel and trade expanded access to the resources available for economic production; and energy derived from fossil fuels encouraged industrial and infrastructure growth and enabled the development of new technologies.

However, growing scientific literature confirms that after the middle of the 20th century (i.e. 1950-1970), an inflection point emerged. The demands of human economic activity kept accelerating, and began to progressively surpass Earth's regenerative capacity. We collectively began to run a natural capital deficit, with ongoing declines in natural capital stocks – natural resources and especially ecosystems. Recent UN Environmental Program analysis indicates global natural capital declined by 28 percent in absolute terms, and 50 percent per capita, between 1992 and 2019.

The result is that accumulating and accelerating damage to the natural capital foundation of all economies has slowed productivity growth. Natural capital, a productivity driver for three centuries prior to 1950-70, is a productivity decelerator today. The erosion of natural capital has now reached sufficient magnitude to exert significant and growing downward pressure on productivity growth globally. Canada is no exception.

The economic impacts of natural capital erosion, including climate change, are widely apparent. Wildfires, floods and other extreme weather have damaged and destroyed homes, businesses and infrastructure and resulted in loss of life, displacement, and lost economic activity. Drought and volatile weather are raising the incidence of crop failures. Pollinator decline has reduced agricultural productivity. Depleted fish stocks have led to the closure of entire fisheries, as with Newfoundland's cod fishery. Together, these forces have pushed up food prices. And the depletion of conventional oil reserves and related shift towards more costly oil sands extraction has markedly reduced productivity in the Canadian oil and gas sector.

Why has this natural capital erosion and transformation, from productivity driver to productivity decelerator, gone largely unnoticed? The short answer is because we didn't look. Due to the absence of natural capital from most conventional economic analysis, these effects have been obscured. Production functions typically include labour and capital as the key factors of production but have generally ignored the role of natural capital or resources.

That gap in our thinking on the interaction between natural capital and the economy is finally being addressed, albeit gradually. Both UNEP and the World Bank have made concerted efforts over the past decade to measure the impact of natural capital erosion. Governments, businesses, and financial institutions, supported by the accounting industry, are increasingly taking steps to develop standardized methodologies and reporting, and to integrate the findings into their operations.

We will have more to say tomorrow on the economic consequences and policy implications of ongoing natural capital erosion.

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