

Opening Remarks

Alan Greenspan

Implicit in all our views of the long term is that there are physical limits to growth, reflecting our finite globe and the fact that human beings take up space, produce wealth from physical resources, and pollute the environment accordingly.

It may be true that in some remote distant future, the population explosion will create the reality of a crowded planet fantasized in an old Star Trek episode of the 1960s where people were stacked one on top of another. But for any imaginable future no practical limit is likely to emerge. To be sure, human beings have physical dimension and the necessary food and shelter presupposes increasing physical requirements in a finite world space. But urban concentrations—foreconomic as well as social reasons—are far more dense than world average population concentration and there appears little in the way of limits at least so far as our most far-reaching models can contemplate.

Nor is there any reason to be concerned that the doubtless limited reserves of certain commodities doom levels of activity to some definable levels. As presumed physical limits and shortages emerged in decades past, the price system diverted ever increasing proportion of real value added to conceptual inputs relative to physical inputs. Ideas replaced physical things. Transistors replaced vacuum tubes. The functions are the same but ideas have replaced bulk. Lightweight fiber optics and amalgam of scant material and extraordinary insight are displacing copper wires in the rapidly expanding value-added of telecommunications. New technologies have advanced the state of

architecture and building.

The inevitable increase in the ratio of real value-added per pound is strikingly evident in trade statistics where increasing real exports per pound in the United States statistics confirm other data which indicate the growth of U.S. gross domestic product (GDP) inputs in tons is far slower than growth in real GDP. Similar gains in real imports per pound attest to the same phenomena in those countries from which we import. The data are really quite striking.

Since the accumulation of knowledge is irreversible, with the possible exception of the Dark Ages, we can assume as pressure on physical resources continues to mount the price mechanism will continue to create incentives for ever more concentrated impalpable inputs into our gross domestic products.

Indeed, the distinction between the physical and the impalpable is likely to become ever more vague. Future human needs and wants will surely appear increasingly in small packages. Hence, while it is conceivable in some far distant future that population may run into physical restraints, there is no meaningful notion which delimits the growth in real impalpable gross domestic product per capita.

Worldwide, we are currently struggling with short-term forecasting models which have been less than adequate for policy purposes. We are endeavoring to infer the current operational economic structure from the very little recent history which appears relevant. In so doing, we find ourselves reaching increasingly back in the distant past when asset value changes and debt burdens appeared at best somewhat similar to much of what we observe today. Accordingly, we have had to become especially innovative in manipulating the add factors in the current econometric models built largely on post World War II experiences, which for the moment appears insufficient. It is not easy to make these models track economic processes as they are currently evolving. It has become ever more apparent from these exercises that what policy needs most at this stage are models that effectively tie down the developing long-term forces impinging on our economies. For unless we have some insight into how current short-term aberrations will evolve into the long term, our overall policy posture will

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surely prove inadequate.

This symposium will also cast light on the forces driving growth worldwide, concerns which have been particularly vexing to Americans who are especially fearful that their children will not reach the living standards the current generation enjoys. I trust the papers will shed light on these increasingly important issues.