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# Globalization, Technological Advances, and Other Threats to American Agriculture: Discussion

**Barry J. Barnett and John E. Lee, Jr.**

Both Blank and Debertin start from the premise that technology increases agricultural productivity. As a result, supply increases faster than demand, driving down commodity prices and returns to factors used in agricultural production. Blank emphasizes how farmers respond to this situation by moving to higher risk, higher return commodities until eventually graduating out of agriculture entirely. These changes are accommodated by globalization which allows low-cost imports to substitute for abandoned agricultural production in the U.S. Debertin focuses on the contention that price depressing gains in productivity are due, in part, to publicly-supported agricultural research at Land Grant universities.

Both authors take a “big picture” perspective that allows them to range across a number of issues—publicly-supported research and education, adoption of technology, farm profitability, rural community economic viability, agribusiness concentration, globalization, risk, and international trade—describing linkages that are often ignored by more limited analyses. The trade-off is an occasionally frustrating

lack of detail at critical points in their arguments.

Blank offers what is basically an “up and out” thesis of agricultural evolution. Technological improvement alters comparative advantage. As developing countries adopt new agricultural production technologies, world supply shifts out and prices decrease. In order to earn returns similar to those available outside of agriculture, farmers in developed countries divert factors of production from low-risk, low-return commodities to higher-risk, higher-return commodities. Eventually, the most risk-averse farmers opt out of production agriculture entirely. Under the relentless pressure of technological innovation and global competition, U.S. agriculture continually downsizes. Production agriculture is no longer able to afford the opportunity cost of land and labor resources. Pareto improvements are created by shifting those resources to more productive uses and importing an increasing share of our food and fiber.

In essence, Blank is describing a long-term dynamic adjustment process whereby factors of production flow within and between sectors seeking equalization of returns at the margin. Does he believe that the U.S. will eventually go out of agricultural production altogether? While he stops short of making that prediction here, he has done so elsewhere (Blank, 1998; Blank, 1999).

Our response is threefold. First, while one could easily imagine Blank’s thesis playing out in California where there are tremendous non-farm pressures for agricultural (primarily

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land) resources, it is much harder to envision it occurring in many areas of the Plains, the Corn Belt, or the Mississippi delta. Second, Blank's thesis does not account for increasing opportunity costs of agricultural resources as economic growth occurs within developing countries. Third, the U.S. is currently a large enough agricultural producer that any significant decrease in U.S. production would cause a reduction in world supply and an increase in agricultural commodity prices. Thus low returns to agricultural production in the U.S. would be somewhat self-correcting. For these reasons we are inclined to believe that any flight of resources from the agricultural sector will end long before the U.S. stops farming.

Debertin describes how Land Grant University agricultural faculty are prone to believe that new agricultural production technologies improve farm-level profitability. These same faculty often believe that rural economies are highly dependent on farm economic well-being. Thus new agricultural technologies that increase output or lower costs are perceived as creating economic prosperity throughout rural communities. This "idealized vision," as Debertin refers to it, motivates many who have devoted their lives to agricultural research and education. It also informs efforts to develop and maintain public support for these activities.

Debertin sets out to debunk this idealized vision. Much of this is familiar territory for economists. To the extent that production agriculture is characterized by competitive markets, productivity gains do not lead to long-run increases in farm profitability. Over the past century much of the technological change in U.S. agriculture has allowed for the substitution of purchased inputs for labor. These changes have had profound structural implications for agriculture. Further, most rural communities today are not farming-dependent. Instead they are integrated into the larger U.S. economy through a variety of local businesses and industries. In fact many farmers are able to remain in production agriculture only because they are also able to find off-farm employment in or near their local community.

Thus economists have long recognized that

at least some aspects of the idealized vision were mythical. Yet we have been consoled by the knowledge that at least U.S. consumers were benefiting from continually improving agricultural production technologies in the form of lower food prices. However, Debertin argues that even consumers will benefit less in the future because 1) farm raw materials have become such a small part of the consumer's food dollar, and 2) growing concentration will allow large agribusiness firms situated between farmers and consumers in the supply chain to capture the benefits of future farm productivity gains.

What is the point of Debertin's paper? It seems as though he wants us to come clean and tell farmers that we, the agricultural research and education establishment, have been selfishly misleading them for all these years. Moreover, we are directly responsible for their financial woes. If we had just stuck with the technology that we had in, say, the 1930s, food would be scarce, prices high, farmers rich, and rural communities thriving.

We don't buy it! In the first half of the 20<sup>th</sup> century the farm problem was often characterized as one of low returns to labor. Bruce Gardner, in his 2000 AAEA presidential address, argued that these low returns to labor were caused by a labor market disequilibrium between the farm and non-farm sectors. In the years following WWII this disequilibrium was ameliorated due, in large part, to labor-saving agricultural technologies and a robust general economy that was absorbing labor released from agriculture. As a result, farmers have experienced both nominal and real income gains. Average farm household incomes now exceed those of non-farm households and, due largely to off-farm employment, household incomes of small farms have improved relative to those of large farms.

So what is the problem? Debertin argues that returns to capital invested in agriculture are unacceptably low and that the culprit is new technology and the resulting increases in productivity. But returns to capital investment in agriculture are difficult to measure and interpret for a number of reasons. First, federally subsidized credit has likely contributed to low

net returns to capital in the sector. For example, the period from the 1940s to the 1960s saw a huge flow of subsidized capital into agriculture. The resulting overcapitalization went unnoticed throughout much of the 1970s due to rapid growth in exports and expectations that the U.S. would need to “feed the world.” Following the 1979 change in Federal Reserve policy, declining exports and increasing real interest rates initiated a withdrawal (net of depreciation) of non-land capital from the sector. This continued through the mid-1990s. Second, farm commodity program subsidies have interfered with needed supply adjustments and increased the cost of land. Finally, it is most important to note that while returns to *total* capital invested in agriculture are generally low, farmers do continue to invest in the sector, suggesting that returns to capital investment at the margin are more competitive.

Would farmers be better off if the public-sector had not invested in agricultural research and education? In a closed-economy model it is easy to demonstrate, as Debertin has done, that technology does not increase profitability for farmers selling in competitive markets. However, from an open-economy perspective, technology adoption impacts comparative advantage—a point raised in Blank’s paper. In this environment it is not at all clear that improved technology makes farmers worse off.

Finally, while improved technologies may have kept prices low due to supply increasing faster than demand we would suggest that the margin is thin. If the U.S. had to meet 2001 food demands with say, 1980 technology, we

would expect to see much higher commodity prices, expanded cropland use onto more erosive marginal soils, and more intensive use of chemical inputs.

Perhaps Debertin is simply suggesting that some agricultural research and education dollars would generate higher marginal returns by being shifted to the development of demand-enhancing or food-safety technologies. Or perhaps he is suggesting that Land Grant university scientists should become more aware of the social implications of their research and education activities. In either case we would be inclined to agree.

Unfortunately, Debertin never really addresses the big “So what?” question. We are left to wonder exactly what point he is trying to make. If he is arguing that our historic investment in publicly-funded agricultural research and education has been a mistake—that we should cease public investment in the development of agricultural production technologies, then we must respectfully disagree. What can be wrong with generating technologies that allow us to meet our food and fiber needs with as little demand on society’s scarce resources as possible?

## References

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