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Staff Paper

Reconsidering the Farm Problem Under An Industrializing Agricultural Sector

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Abstract

Traditional notions about the "farm problem" may have to be reconsidered in light of the changing economic characteristics of industrialized agriculture. These changing conditions will affect the opportunity set of policy alternatives available to policy makers in developed countries. Changes in four economic characteristics of the farm sector may affect the acceptability of policy alternatives: (1) An increasing integration of domestic and international markets; (2) An increasing differentiation of farm production intended for specific end uses; (3) An increasing demand for environmental quality, with the income elasticity of the demand for environmental quality being greater than the income elasticity of the demand for food; and (4) An increasing economic diversity in rural areas that erodes the remaining linkages between the commercial agricultural sector and the rest of the rural economy.

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RECONSIDERING THE FARM PROBLEM UNDER AN INDUSTRIALIZING AGRICULTURAL SECTOR

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When Yves Arsenault proposed this symposium, I was very pleased to learn that he wanted to continue the discussion contained in the article that I wrote with James Bonnen (Bonnen and Schweikhardt) A great deal has happened in the short time since we completed our revisions of that article in December 1997, and much of what has transpired in the past three years confirms the central points that we sought to make.

In that article we reviewed the extensive agricultural economics literature on the aggregate behavior of the farm sector, some dating back to the 1930s (Galbraith and Black). We also sought to examine the question of whether that literature was still relevant to agricultural policy debates in the United States and other countries. Finally, we sought to define some of the research agenda that we believe must be addressed if agricultural economists are to be relevant to future discussions of agricultural policy.

Since that article appeared, events have proven that questions about the behavior of the agricultural sector and the debate about the future of agricultural policy in developed countries are as alive as they have ever been. Our article was based in part on what we believed was a misinterpretation of events in the early and mid-1990s. As we stated in the article and elsewhere (Browne, Allen and Schweikhardt), the 1996 Federal Agriculture Improvement and Reform (FAIR) Act was widely interpreted in the press as the "dismantling" of farm programs (Ingersoll). Economists hailed the legislation as an outcome long sought by the profession: a shift toward decoupled payments that avoided the distortions created by price supports

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or target price payments. Observers in other countries cited the legislation as evidence that the United States had entered a new era of agricultural policy that would eventually provide leadership in establishing less distorted policies around the world (Harvey).

But in a just a very short period of time, we have witnessed a dramatic change in the tone and content of agricultural policy discussions in several developed countries. Consider the following:

- After declining for nearly a decade, agricultural subsidy transfers to farmers began to increase in 1997, particularly in the European Union and the United States. Transfers to farmers by the governments in the OECD countries rose from \$216 billion in 1997 to \$251 billion in 1998, with \$16 billion of this increase occurring in the United States, and \$19 billion of this increase occurring in the European Union (Organisation for Economic Cooperation and Development, pp. 167-68).
- For each of the past three years, the United States has added "Market Loss" payments to the original decoupled payments contained in the FAIR legislation. These additional payments, while still decoupled, increased the scheduled payments by 50 percent in 1998 and 100 percent in 1999. The Republican leadership of the U.S. House of Representatives has already indicated that it will at least double the scheduled payments for the 2000 crop year. With Congress still in session, drought conditions developing in some regions of the United States, and an election year under way, it is possible that these payments could increase further before the end of this crop year.
- The increase in decoupled payments tells only a part of the subsidy picture in U.S. agriculture. Loan deficiency payments, made as part of the marketing loan program contained in the FAIR Act, will total \$2.7 billion in Fiscal Year 1999 and an estimated \$3.4 billion in Fiscal Year 2000 (USDA, 2000, p. 56). An additional \$2.3 billion was spent in Fiscal Year 1999 on disaster payments to producers who suffered production

losses and \$1.5 billion on the Conservation Reserve Program. With prices having fallen below the loan rates for most of the program crops, the decoupled features of FAIR are becoming re-coupled to loan rates. Consequently, while the original Freedom to Farm payments were decoupled, the loan rates are coupled to production decisions and could influence planting decisions.

- In total, for the 1999 calendar year, government payments in the United States totaled \$22.1 billion dollars. In nominal terms, this was the third highest level of spending on record, following only the years of 1986 and 1987, the depths of the farm crisis a decade earlier. As a measure of how swiftly the farm situation has changed, consider that the share of U.S. net farm income derived as government payments has risen from 13 percent in 1996 to 47 percent in 1999 and is projected to be 43 percent of net farm income in 2000.²
- The farm income problem in agriculture and the associated political debate about policy alternatives is not limited to the United States. Canada has also facing a stagnant outlook for farm income, with realized net farm income projected to decline from \$7.3 billion Cn in 2000 to \$6.3 billion Cn for the 2001 to 2003 period. The prospects of a poor income outlook, combined with significant regional differences in outlook, set off an intense debate at provincial and national levels over the level of assistance provided to Canadian farmers (Agriculture and Agri-Food Canada; Brooke).

²The share of U.S. net farm income derived from government payments in 2000 will probably be much than this projection. Net farm income is projected to fall from \$48 billion in 1999 to \$40 billion in 2000, with government payments projected to be \$17 billion in 2000. This projection of government payments, however, does not include any increase in payments that Congress is likely to approve this year. Given the political ramifications of such a decrease in farm income during an election year, Congress is almost certain to increase payments in 2000. Unless farm income from some other source improves, the share of income derived from government payments will increase above the level now projected and will likely exceed the 1999 figure (USDA, 2000, p. 7).

While the future of agricultural policy will not be openly debated in Congress this year, Congress must write a new farm bill in 2002, and may undertake that task in 2001, particularly if party control changes hands in this year's election. While the incredible amounts now being spent on farm programs in the United States have received little public comment either by members of Congress or in the press, such will not be true when a new Congress convenes next year.

My conversations with members of the Michigan congressional delegation suggest that three questions will be uppermost on policy makers' minds as they contemplate the future of agricultural policy: How did we get here? What are we getting for the money we are spending on agriculture? And what should we do next? Indeed, I believe that these same questions are on the minds of policy makers in many countries. If agricultural economists are to be relevant to the needs of policy makers, we must be prepared to answer those questions. Though I believe that the economics of "the farm problem" that we have relied upon in the past are still relevant to those questions, I also believe that the radical changes coming in many parts of the food system will require us to broaden our perspectives on the nature of the farm problem and on the policy alternatives that must be considered as we move forward.

Considering the Traditional Notions about the Farm Problem

The policy problems faced by the agricultural sector are conditioned by the economic characteristics of the sector. These characteristics define the policy opportunity set available to a nation's policy makers at a given point in time. More specifically, this opportunity set will define for decision makers the policy alternatives that are likely to prevail in the policy process by defining each of the following:

- The policy issues that are most relevant to the agricultural sector
- The policy alternatives that are available to address these policy issues
- The economic consequences that are likely to follow from each alternative and
- The political acceptability of those economic consequences.

As a nation develops, certain common economic characteristics of the farm sector will define this opportunity set at each stage of development. While the degree to which each of these characteristics will determine the opportunity set for policy makers is unique to each country, history suggests that nations pass through a reasonably predictable series of stages in which the policy opportunity set is transformed by the changing economic characteristics of the farm sector. These changing economic characteristics are both a consequence and a cause of the process of industrialization that transforms agriculture in the development process and creates farm sector characteristics, and consequently farm policies, that in developed countries are greatly different from those associated with the agrarian sector of low income, developing nations.

Fundamental Economic Characteristics Have Policy Consequences: The common nature of the policy problems facing the farm sector is rooted in the fundamental economic characteristics of the sector. These characteristics lead to a predictable set of policy issues as the agricultural sector is transformed by development. These economic characteristics are well known to this audience:

- The price elasticity of aggregate demand for farm products is inelastic.
- Aggregate demand for farm products is transformed in the development process, as a
 declining income elasticity of demand and a declining growth rate in population both lead
 to slow growth in the demand for food.
- The market structure of the farm sector dictates that farmers are price takers.
- The price elasticity of the supply of farm output is inelastic in the short run.
- Production in the farm sector is marked by rapid technological change, particularly as countries move beyond the earliest stages of development.
- Assets in agricultural production exhibit varying degrees of asset fixity or asset
 specificity that may affect the ability of the agricultural sector to adjust its output in response to changing prices.

The economic character of all national agricultural sectors change greatly as the economic development process unfolds (Table 1). The policy alternatives available to decision makers are constrained by these fundamental but evolving characteristics of the farm sector. It is from these characteristics, and the historical experiences analyzed by many members of this profession, that policy lessons may be drawn.

Table 1: Some Economic Characteristics of Agricultural Sectors in Low Income and High Income Countries

Agrarian or Farm Sector Economic Characteristics		Low Income "Developing" <u>Economies</u>	High Income "Developed" <u>Economies</u>
Income Elasticity of Demand ⁶		$.8090^{1}$	$.1020^2$
Price Elasticity of Demand ⁶	(SR) (LR)	40 ⁷ -1.0 ⁷	30^{2} -1.0^{2}
Price Elasticity of Supply ⁶	(SR) (LR)	$.1020^{3,4}$ $.40-1.2^{4,7}$.10(1 prod. period) ¹ .80-1.0(3-5 prod. periods) ²
Percent of Population Rural ⁵		80-90%	2-25%
Percent of Labor Force in Farming ⁹		30-90% Av. 69%	1-18%
Percent of GDP as Farm Sector Income 9		20-50% Av. 38%	1-8%
Percent of Farm Inputs Purchased ⁷⁵		0-20%	50-85%
Labor and Total Productivity of Farm Sector ⁷		Low	High
Ratio of Capital/Total Land in Farms ⁷		Low	High (\$1,020/Ac, US, 1994) ⁸
Ratio of Capital/Total Labor Force on Farms ⁷		Low	High (\$333,177/person in 1994) ⁸
Number of Farms ⁷		Many	Total number declines by 2/3 or more; only 20-30% are commercial farms
Size of Farms ⁷		Very Small	Average size increases 10x or more (470 acres in US in 1994-1995) ⁸
Courses			

Sources:

¹ Stevens.

² Tweeten, p 20.

³ Mellor, p. 180.

⁴ Krishna, p. 161.

⁵ Author's estimate based on statistics in World Development Report, Washington, DC: World Bank, 1990.

⁶ Aggregate elasticities.

⁷ Author's estimate, 1996.

⁸ Calculated from Agricultural Statistics, 1995-1996, U.S. Department of Agriculture, 1996, Tables 524, 534, 540.

⁹ Author's estimate based on statistics in World Development Report, Washington DC: World Bank, 1996.

Policy Lessons From the Early to Middle Stages of Development: Low income nations with a preindustrial, developing agriculture will often discriminate against, or tax, their farm sector while protecting
or subsidizing other domestic industries, especially those producing import substitutes. The economic
character and large relative size of the farm sector in a low income nation makes national policy
intervention to subsidize farmers difficult, if not impossible, to finance. This happens because, in addition
to its low per capita income and price inelastic demand for food, low income country farmers are a large
majority, often 80 to 90 percent, of the population and 30 to 90 percent of the labor force, even though they
generate a much smaller share of national income. Consequently, any attempt to subsidize or protect
farmers will have two disastrous effects. The first impact is on the nation's economic development as the
cost of living rises with food costs and thus, through the wage bill, the cost of everything else the nation
produces also rises; and secondly, on the cost of farm subsidies, which would soon exceed the revenues of
the state (Anderson; Anderson and Hayami; Timmer).

Midstream in the industrialization of agriculture, there is a shift in the nature of the policy problems of the farm sector and the policy alternatives available to decision makers. This eventually leads to policies of protection and subsidies for the farm sector. Though each country will reach this stage of transition at a unique point in its development process, intervention to protect farmers usually occurs in a developing nation only after: (1) the income elasticity of demand falls to the point that food is a small share (under 30 percent) of consumer budgets; (2) farm labor is a small part (under 20 percent) of total labor force; (3) most farms producing for the market specialize in only a few commodities; and (4) the number of viable commercial farms has peaked and is declining.

These characteristics mean that, unlike the situation at the early stages of the development process, a nation entering this middle stage of the development process will have reached the point that: (1) development has substantially increased the wealth of the nation; (2) increased food costs from protective farm policies have only a small impact on the total cost of consumer living and thus, on the nation's wage

bill; (3) the percent of the total labor force subsidized by government programs for agriculture is small enough to be within the taxing capacity of the state; (4) highly specialized commercial farmers develop an "intense interest" in the public policies that affect the few commodities determining their welfare, and (5) the transaction costs of organizing farmer interest groups to influence policy is much lower, since the cost of organizing falls as farm income increases and numbers decline.

Policy Lessons From the Later Stages of Development: As countries pass through the middle stages of development and proceed to high levels of income, their agricultural sectors continue to experience a common set of problems which, while different from the problems experienced during the early stages of development, continue to be founded in the sector's fundamental economic characteristics.

The first problem to arise is a growing instability of farm prices and income as the farm sector becomes more integrated with the commercial market and the money economy. The inelastic nature of the demand for farm products, combined with an aggregate farm level output that is also relatively unresponsive to price changes over a short to intermediate time span, results in price and income instability. There are, of course, many sources of biological and man-made uncertainty that also exacerbate the instability of farm commodity markets. Compounding the instability in farm product markets is a market structure-monetary phenomenon. As farming becomes integrated with the money economy it becomes more vulnerable to domestic and international macroeconomic events (Schuh). As the export share of production increases in those agricultural sectors that generate an exportable surplus, the impact of inelastic demand is ameliorated somewhat since the price elasticities in export markets are generally higher. At the same time however, increased dependence on foreign trade leaves the agricultural sector more vulnerable to international market fluctuations, adding to price and income instability.

A second problem that arises is the adequacy of returns to factors of production in farming. As the development process proceeds through the higher income stages, technological change in the agricultural sector accelerates, supported by public and private investments in research. The addition of rapid

technological change to the fundamental economic characteristics of the sector results in a further transformation of the nature and dimensions of the policy choices confronting policy makers. As explained by Willard Cochrane's Schumpeterian "agricultural treadmill," continuing changes in technology increase supply more rapidly than demand, creating downward pressure on prices and, due to inelastic demand, similar pressure on income (Cochrane, 1958, 1965, and 1992). As cost-reducing technologies are adopted, the low price elasticity of demand, combined with the declining income elasticity of demand, result in declining prices and excess capacity in the sector. Early adaptors of new technology reduce their unit costs and earn adequate returns despite declining real prices, while farmers who lag too far in adopting improved technologies are eventually pushed out of farming. No individual can gain from reducing output, and in a competitive market with no effective control of aggregate output, the downward pressure on prices continues.

Cochrane's model alone, however, cannot explain all of the adjustment problems faced by a developed agricultural sector. The rising capital intensity of agriculture that occurs as the development process proceeds gives rise to an additional characteristic that limits the sector's capacity to adjust production, thereby giving rise to income instability problems in the sector. Closely associated with this rise in capital intensity is an increasing condition of asset fixity, or asset specificity, in agriculture. As production assets become more specialized, they are subject to a greater degree of specificity that limits their capacity to be adjusted to changing prices. Uncertainty, or lack of perfect information, leads to errors in investment decisions as farmers seek to maximize profits.

If market prices increase and indicate that an expansion of production is profitable, farmers will invest in assets to expand their production capacity to match this new level of profitability. Should prices then decline, however, these decisions are not perfectly reversible. Instead, the transaction costs associated with the investment and disinvestment in these assets – assembly/disassembly costs, transportation costs, ownership transfer costs, search costs, and negotiation costs – can lead to differences in the acquisition

values and salvage values of farm assets. Since many farm assets and investments are long-lived and highly specialized, their salvage value in place tends to be low and, even if movable, often much less than the original acquisition value. As a result, producers cannot reverse their decision to invest in the fixed assets. Instead, despite the fact that they cannot gain a return that covers their full acquisition costs, they continue to produce because the returns exceed the next best alternative that would be received if they disposed of the asset (Johnson, 1958, 1972, 1985 and 1997; Hathaway; Edwards; Baquet). Consequently, because investment errors cannot be corrected when prices decline, there is a tendency to overinvest and for production adjustments to be very slow and costly in terms of the losses accumulated relative the acquisition value of the assets. In essence, farmers have an incentive to continue production as means of minimizing the losses associated with the investment decisions made under uncertainty. Johnson's asset fixity (also known as investment-disinvestment) theory appears to be the most complete explanation of the farm sector's observed behavior during in both developing and developed nations. Moreover, the adjustment problems created by asset fixity arise from many sources of uncertainty and applies not only to changes in technology (as did earlier models), but also to changes in institutions (e.g., macroeconomic instability, production controls, trade restrictions, etc.), to changes in improved human skills and capacity, and to changes in the natural and man-made capital base of agriculture.

Considering Some New Notions About the Farm Problem

The development process has proceeded to the point that many believe that the farm sector is now, or is on the way to becoming, an industrialized sector in many developed countries. If this is true, what are the important characteristics of the sector that will determine our policy opportunity set in the future? I believe that the characteristics already described – low price elasticity of supply and demand, low income elasticity of demand, and an asset base marked by a high degree of asset fixity – will continue to apply to the sector. I believe, however, that new characteristics will apply to the sector that will further transform the policy opportunity set. These will include:

- An increasing integration of domestic and international markets.
- An increasing differentiation of farm production intended for specific end uses.
- An increasing demand for environmental quality, with the income elasticity of the demand for environmental quality being greater than the income elasticity of the demand for food.
- An increasing economic diversity in rural areas that erodes the remaining linkages between the commercial agricultural sector and the rest of the rural economy.

The Integration of Domestic and International Markets: As the agricultural sectors of developed countries become industrialized, the slow growth in domestic demand for food ultimately increases the share of output sold in export markets. As a result, at least three major changes occur that affect the policy opportunity set available to policy makers. First, producers are exposed to additional sources of instability, as events in other markets – weather, income growth or stagnation, and macroeconomic policy changes – affect the demand for exports and the market price for producers that sell a significant share of their production in export markets (McCalla and Josling, pp. 47-50).

Second, if the price elasticity of the world market demand is more elastic than the domestic demand, policy makers' traditional assumption that supply controls will have a significant affect on price may no longer be true. To the extent that an individual nation's supply of a commodity is simply a share of the total world supply, attempts to increase price through unilateral reductions in supply will be less successful than was true when a relatively small share of production was exported.

Third, the impact of continued rapid technological change within progressively integrated world markets and an industrialized agribusiness input sector can be quite different from that which we traditionally have assumed. The rapid technological change envisioned by Cochrane was provided by public investments in research and delivered to farmers by public agencies whose primary incentive was the service of those producers whose taxes supported such services. As the industrialization process reaches full bloom, however, privately funded research, provided by multinational input companies whose primary

incentive is the maximization of their profits, guarantees that the spread of technology across national borders will accelerate, with new innovations being adapted to local conditions much faster than before. The consequence of this change is that the "window of opportunity" for early adopters – who in the earlier stages of development were those farmers in nations that supported public research most generously – grows much shorter as technology becomes more mobile. Consequently, a source of competitive advantage that has traditionally been most accessible to producers in the developed nations begins to erode, again raising questions for policy makers about what policy alternatives will provide their producers with an advantage in integrated markets.

The Differentiation of Farm Products: As the end uses of farm products (and the characteristics of farm products needed to serve those end uses) become more specialized, the markets for farm products are transformed from a market of homogeneous products to a series of markets for increasingly differentiated products. Some contend that the application of biotechnology to design farm products with specific enduser characteristics will simply accelerate a trend that is already underway (Barkema, et al). Others contend that this trend is driven by food processors' need to manage risk, particularly quantity, quality, and food safety liability risks (Boehlje and Schraeder; Boehlje). As such markets emerge, with each presumably having a unique combination of costs, yields, and returns, stabilization policies or income support policies designed for homogeneous commodities may no longer be applicable to these increasingly fragmented markets. The transformation of agricultural markets into differentiated products will likely lead to an increased reliance on the use of contracting and other vertical coordination mechanisms between farmers and food product manufacturers (Barkema, et al), moving a part of the market stabilization function to the private sector.

If such specialized products require investments in product-specific assets, then the problems of asset fixity, or asset specificity, would continue to confront the sector. The asset fixity problem in this new era, and the potential policy alternatives to address that problem, could be quite different. First, the

increased investment in assets that are specific to a transaction with a contracting partner could further widen the difference between acquisition values and salvage values, thereby further limiting the producer's ability to disinvest in such assets should the price of the contracted output decrease after the investment is made. Second, the use of contracts and other less transparent vertical coordination mechanisms would again make traditional commodity policy alternatives less viable. If the prices at which farm products are contracted are not transparent, then policy makers' ability to judge the validity of producers' claims that income support is justified becomes clouded. Moreover, determining any sort of equitable distribution of income support across producers operating under differing contract terms becomes a nearly overwhelming task for policy makers. Under such a system, any policy based on an assumption of the homogeneity of products, markets, or producers will almost inevitably fail to achieve an equitable distribution of government support among producers.

Finally, there remains the question of whether contracting or other vertical coordination mechanisms can themselves overcome the adjustment problems associated with asset fixity. The literature on vertical coordination holds asset specificity as a central factor in determining the choice of coordination mechanisms among vertically-related firms (Williamson, 1985 and 1996; Boehlje; Peterson and Wysocki). The use of contracting, for example, is expected to arise when one of the two firms engaged in a market exchange must invest in an asset that is idiosyncratic to that transaction. Because the asset is unique to the transaction for which it is used, it will have a much lower value in any alternative use (i.e., in Johnson's terms its salvage value in another use will be much lower than the acquisition value paid for the use at hand). Without a contract that assures a market for the output produced by this transaction-specific asset, the firm responsible for investing in this asset will have no incentive to do so.

The transformation of the market structures in agriculture into a series of vertically-linked "supply chains" raises the question whether such contractual arrangements will achieve an optimal level of production between the two firms in the chain and prevent the overinvestment problems that have been a

characteristic of the farm problem. This issue deserves investigation as an intersection between the Johnson's asset fixity theory and Williamson's theory of asset specificity. On the surface, however, it must be stated that Johnson's asset fixity theory might lead one to conclude that two firms operating within one supply chain (say a farmer producing hogs and a pork processor selling branded pork products) could arrive at a contract that achieves what appears to be an optimal level of investment in a transaction-specific asset needed by these two firms. At the same time, in a separate pork supply chain, another farmer and another pork processor could be doing the same. If these two supply chains are both competing in the same retail market for pork, however, the pork sector could still have excess capacity, despite the fact that both supply chains invested in what they believed was an optimal level of investment. Very simply, if the two chains, operating independently overestimate the demand for their products and base their capacity and investment decisions on this mistaken estimate, the industry could still face aggregate excess capacity that would leave each supply chain with assets that suffer losses relative to their acquisition value. The possibility of excess capacity acting as a barrier to exit is recognized as a factor that can affect the behavior of firms in many industrialized sectors outside of the food system (Caves and Porter; Lamfalussy; Porter; Besanko, et al; Harrigan; Palmer, et al; Thompson and Stickland).

A major difference between the "old" farm problem of excess capacity and the potential problems of excess capacity in these emerging supply chains, however, is that, once again, traditional policy remedies may not be able to address the problems of an industrialized food system. If investment mistakes occur and some producers suffer losses relative to the acquisition value paid for their transaction-specific assets, the division of those losses between the farm-level producers and the other contracting firm in the supply chain will depend upon the specific language contained in the contract and the changes in the terms of a contract that might be negotiated between the parties once the excess capacity becomes evident. From a policy perspective, this places a much greater emphasis on the fine-grained details of contract law in determining the sharing of such losses. Moreover, traditional income support remedies will have much less capacity to

render assistance to producers, both because of the lack of transparency of the losses and because such income support would immediately be translated by political critics as a regressive redistribution from taxpayers to the corporate contracting party.³

The Rising Demand for Environmental Quality: As the industrialization of agriculture proceeds, there will is an increased recognition of the external impacts of farm production on soil, water, and air quality, on the sustainability of the resource base, and on other dimensions of environmental quality. Once again, the fundamental characteristics of the agricultural sector contribute to the emergence of these new policy issues.

Crosson has hypothesized that the income elasticity of the demand for environmental quality is greater than the income elasticity of the demand for food. If this is correct – and empirical evidence suggests that it probably is true – then the demand for environmental quality is likely to increase at a faster rate than does the demand for food as the industrialization process proceeds (Crosson; Radetzki; Runge). As a result, consumers – acting as voters – are likely to demand greater regulation of agricultural industries and are unlikely to be swayed by the argument that such regulations will increase food prices. As a part of this expression of demand, environmental advocacy groups emerge as permanent stakeholders in agricultural policy decision making processes. Policymakers will face new constraints, and policies that increase farm income at the expense of environmental quality are less likely to be politically acceptable.

³It has long been recognized that commodity programs have been somewhat regressive in their distributional effects (Bonnen; Schultze) and this regressive effect continues to draw criticism (Williams-Derry and Cook). The fact that corporate contracting partners might be a more direct beneficiary of program benefits if they are relieved of some of the burden of absorbing the losses that arise from overinvestment will likely heighten the criticisms of the programs' distributional consequences.

⁴At this stage of economic development, consumers have long ago passed the point at which an increase in farm level prices has a significant effect on real wages. Thus, insistence by farm organizations that consumers will "regret" the higher prices caused by environmental regulations would appear to be unfounded. If the income elasticity of the demand for environmental quality is greater than the income elasticity of the demand for food, voters might view such trade-offs as acceptable.

Instead, society is more likely to ask whether policies can be designed that are more consistent with environmental quality objectives, and are likely to demand increasingly stringent forms of environmental compliance by farmers as a prerequisite for receiving program benefits. This creates significant redistributional consequences for many existing farm programs: In many cases, the existing farm programs do not provide benefits in regions or to commodities that may create the most serious environmental externalities. Thus, any attempt to incorporate environmental objectives into program decisions could reallocate program benefits away from existing beneficiaries and impose capital losses on the assets of those producers. (Batie; Lynch and Smith).

The Erosion of Linkages Between the Farm and Rural Economies: A final issue emerges in the latter stages of development when the structural transformation of agriculture fractures rural society, creating other problems and potential new policy issues. In an industrialized farm sector, the production of farm inputs and the processing of farm outputs takes place somewhere other than the local rural economy. Though we do not understand the full implications of e-commerce for the farm sector, it is already clear that the opening of regional and national e-markets for input supplies will further erode the connections between farmers and local input supply firms (Peterson). The rural sector fragments into a declining number of successful commercial farms, a growing set of part-time farms (some in real poverty and others that are recreation or hobby farms owned by urbanites with substantial off-farm income), and rural residences with no farming activity. On the one hand, questions arise about the need for rural policies that serve sectors other than commercial agriculture, and on the other hand doubts arise about whether policies aimed at providing income support to farmers can significantly affect the rural non-farm economy. Despite the diversity of rural structure and interests, pressure mounts for a broader policy for rural communities that facilitates growth and/or protects rural amenities and ecosystems. Rural poverty, which is less visible in developed societies but often of higher incidence than urban poverty, begins to attract advocacy, if not policy action. Despite the still popular rhetoric in the United States that, "The best rural

development policy is a good farm bill," agriculture's claim as the locomotive of the local rural economy has disappeared in many rural areas (Drabenstott and Smith). In the face of such changes, the "farm problem" is merely one of the many policy issues that affects the quality of rural life.

Conclusions

Perhaps the conclusion that we should draw is that we can no longer think about "the" farm problem. Nations face a series of predictable, if somewhat unique, policy problems in their agricultural sectors as they pass from lower to higher levels of national income. Nations around the world are struggling to define the problems faced by their rapidly evolving agricultural sectors and to understand how the sector's economic characteristics will affect their policy alternatives and consequences. They will discover, once again, that the consequences – and thus the political acceptability – of their alternatives will be determined, in part, by the fundamental economic characteristics of the sector.⁵

As we witness the next stage in the transformation of agriculture's place within an industrialized food system, we are headed toward another major transformation of policy for agriculture. Today the issue of the vulnerability of the farm sector involves these questions: Is the farm sector, or more accurately today's differentiated subsectors of an industrialized farm sector, so mature that any specific subsector no longer needs or justifies public policy interventions? Are these subsectors now so industrialized and changed in economic characteristics that they no longer need subsidies or other forms of regulatory protection or stabilization – i.e., changes in tax rules, the commercial code, domestic market regulations or

⁵Though this paper has focused on the immediate policy problems faced by developed countries, the arguments presented here also have relevance for policy makers and policy analysts in developing countries. As these nations proceed through the economic development process, they will confront the fact that their policy opportunity set is transformed by the development process. These countries might benefit by understanding the decisions and consequences of policy choices (some might say mistakes) made in the developed countries. As one experienced observer, reflecting on the U.S. experience at dealing with the policy issues raised by the economic transformation of agriculture, told a European audience in 1972, "Some of this may be applicable [to you]. If it is useful, you are welcome to it, at no added cost. The experience is already paid for, and, as I said, the price was high" (Paarlberg, p. 11).

international treaties? Or alternatively, for any given subsector, what policies, if any, make economic sense? Equally important for the equity and stability of society, what makes social policy sense? And finally, what other obligations – environmental protection, for example – do farmers owe to the rest of society?

Farming and its affiliated agricultural markets are becoming so fragmented by specialization, product differentiation and differential industrial market structures that these questions, and thus appropriate policies, must be answered fragment by fragment, subsector by subsector, and possibly region by region. For these different subsectors the answers to these questions are, in many cases, not obvious. What policy actions might be justified in any one market, and by what criteria, are even less obvious. Policy makers will rightfully expect agricultural economists to earn our keep by helping to answer these questions.

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