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PANEL 1: AGRICULTURAL HISTORY:
LESSONS FROM AGRICULTURAL DEVELOPMENT

ORGANIZER AND CHAIRPERSON

Vernon W. Ruttan (University of Minnesota, USA)

PANEL DISCUSSANTS

Technical Changes in US Agricultural History: A Perspective on the Induced Innovation Hypothesis *Alan L. Olmstead (University of California-Davis, USA)*

Contract Choice: Land and Labour Relationships in China in the Imperial, Communist and Post-Communist Period *Lauren Brandt (University of Toronto, Canada)*

Historical Change in Land–Labour Relationships in Western Europe *Gerd Anderson, Günther Schmitt, Heinrich Hockmann (University of Göttingen, Germany)*

Between Political Control and Efficiency Gains: The Evolution of Agrarian Property Rights in Mexico *Alain de Janvry (University of California-Berkeley, USA), Gustavo Gordillo (FAO), Elisabeth Sadoulet (University of California-Berkeley, USA)*

Contract Choice and Tenure Relations During the Pre-Colonial, Colonial and Post-Colonial Periods in India *Vasant Sukhatme (Macalester College, USA)*

A Comparative Perspective on Change in Technology and Land–Labour Relationships *Hans P. Binswanger (World Bank)*

RAPPORTEUR

*Regina Birner*¹ (University of Göttingen, Germany)*

^{*1}An asterisk indicates the main author or authors of the reports. Invaluable assistance in the preparation of panel material was given by Katinka Weinberger (University of Bonn).

The aim of the discussion was to confront the well known 'induced innovation' hypothesis with further evidence as to its applicability from a range of countries and of time periods. Alan Olmstead began by arguing that the available historical data are quite different from the so-called 'stylized facts' to which the induced innovation hypothesis model was applied for testing. In particular, it seems that the considerable biological innovation which occurred before the 1930s contradicts the whole notion. It is also true that there was considerable variation in what was happening within the various regions of the United States; there were great differences in interest rates and in land values, which makes any generalization impossible.

An air of scepticism about the robustness of the hypothesis pervaded the contributions of other members of the Panel, though it did become clear that there are great difficulties in formulating adequate tests since alternative specifications can be used. Heinrich Hockmann, who presented the work on Western Europe agricultural history, discussed two models which suggested that a number of variables not captured by the induced innovation hypothesis could be important in explaining developments there. It was also apparent that there can be fundamental differences in types of economic institutions which make comparisons on a grand scale distinctly problematic. Account has to be taken of such features as the Zamindar system of India with all of its principal-agent problems, mentioned by Vasant Sukhatme, and intricacies of relationships in China and Mexico.

In more general discussion, Alain de Janvry pointed out the need for clarity of definition prior to analysis. For example, access to new crops (a feature of the early history of the United States) represents a shift in the entire set of innovation possibilities. This situation differs from a 'simpler' alteration in price relationships, for which the induced innovation hypothesis was formulated. As the discussion widened to the floor, James Roumasset (University of Hawaii) suggested that the hypothesis is very useful as a starting point for analysis. The question then is to find out how much can be attributed to the facts captured within it, and how much has to be explained by other facts such as economies of scale or transaction costs. It would not be surprising if in some cases the proportion of facts which could be explained by induced innovation became small. Colin Thirtle (University of Reading) agreed with that basic proposition, noting that, in his researches, he found that the hypothesis was useful at the aggregate level, precisely as a starting point, but this was not the case in microeconomic studies. John Pender (IFPRI) was more sceptical, wondering whether factor prices are really relevant as incentives in the search for future innovations because there is a time lag involved. Past factor prices may lead to wrong expectations because they may not be good predictors of future situations. There were comments on this broad issue in the work of Hans Binswanger.

Bruce Johnston (Stanford University) noted that the whole debate on induced innovation should not now be regarded as one relating to history, important though that is in itself. It is still a live issue in relation to what he called 'late developing countries', where there is an abundant rural labour force caused by population growth and the share engaged in agriculture is still high. Using that

relatively cheap resource in the optimum way remains critical for both employment and growth.

Vernon Ruttan, as co-author of the original work on induced innovation, concluded the session with the comment that, for him, the most interesting cases to investigate are actually those in which the hypothesis appears not to work, rather than those where it is more adequate. There is clearly much which remains to be done, both for history and for modern analysis.