

## Experiments in ‘Participatory Econometrics’

### Improving the Connection between Economic Analysis and the Real World

*What the author calls ‘participatory econometrics’ provides a way for economists to respond better to the challenge of the real world. To illustrate the approach, an example, is outlined of a research project that used participatory econometrics to understand the behaviour of poor households. Some generalisations on the added value of participatory econometrics over more conventional methods of analysis are then briefly drawn.*

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Jean Dreze in a recent essay [Dreze 2002] makes an eloquent argument for why academic research should be combined with engagement with real world involvement and action in order to make a difference. In this essay, addressed primarily to econometricians, I make the case for what I call ‘participatory econometrics’, which provides a way for economists to respond to the challenge posed by Dreze. Illustrations of this approach are provided from my own work, but this is mostly for reasons of convenience and brevity as there are now several economists who follow a similar approach, Dreze being one of the most prominent among them [e.g. PROBE Team 1999]. However, I think it helps to give the approach a label and outline some basic principles.

Most econometricians analyse quantitative data collected by someone else. As the principle of comparative advantage tells us there can be much value in this, but it also disconnects the econometrician from the very people whose life she is attempting to understand. Ground-level realities can be ignored in favour of hypotheses that are constructed by reading secondary literatures with relatively stagnant conceptualisations of human behaviour. Innovations in the literature are more often the result of staring at one’s navel in an air-conditioned office rather than getting your hands dirty in the field.

The heavy, slow-moving, machinery of surveys can stultify the ability of the researcher to react to surprises, where her preconceptions are confronted by a different reality. All of this aids in the reproduction of existing stereotypes rather than a constant updating of research questions based upon grounded understandings. The problem is compounded when the subjects of the research are poor people living in cultures very different from the econometrician’s own.

In order to combat this, many development economists have begun to conduct their own specialised surveys, an intellectual development that dates at least as far back as the work of Epstein (1962), followed by Bardhan and Rudra (1978), Bliss and Stern (1982) and many others. In this note I go a step further and make the case for an integrated exercise that employs a combination of econometric, ethnographic and participatory techniques to develop a methodology of evaluating living standards. This method is informed by Sen’s criteria of functionings and capabilities [Sen 1988], that views human behaviour as the result of a combination of economic, socio-cultural and political choice sets. It is, thus, in many ways, a return to Epstein’s multi-disciplinary style of analysis (with the addition of economic theory and econometrics), and similar to Bliss and Stern’s approach in the Palanpur project – but there are some differences. This method combines Participatory

Appraisals, focus group discussions, and participant observer methods, with quantitative data from structured surveys of representative samples, where the researcher is involved in every step of the process from mixed method data collection to mixed method analysis. It is, thus, an attempt to integrate econometric and qualitative techniques with the spirit of Participatory Development [Chambers 1997]. This method, that I have elsewhere called ‘Participatory Econometrics’ [Rao 1998], is a valuable way of reducing the distance between the analyst and the subjects of her research and of letting the voices of the researched influence the analytical apparatus of the researcher.<sup>1</sup> The method differs from other attempts to integrate qualitative and quantitative methods in that the econometric analysis is central to the exercise, and it has the participatory aim of making respondents important players in the analytical work.

To illustrate the method, I will outline an example of a research project that used participatory econometrics to understand the behaviour of poor households. I will then briefly draw some generalisations on the added value of participatory econometrics over more conventional methods of analysis. While I will focus on one project – a case study of a ‘backward caste’ community of potters from rural Karnataka, where I conducted two rounds of fieldwork in 1992 and 1994 – I will bring in illustrations from other more recent works as well.

#### The Potters Project<sup>2</sup>

The original aim of this project was to understand how socio-cultural and economic systems interact to affect living standards, focusing on the role of marriage markets. I picked a community of potters spread across three villages mainly because they were an endogamous caste that exchanged brides between the villages and, thus, represented a single marriage market. The first round of fieldwork was conducted in 1992 with a team of social workers who were all extremely familiar with local conditions. We implemented a series of PRA exercises, focus group discussions, and in-depth interviews and administered a structured quantitative

questionnaire to every household in the community. The questionnaire was a standard instrument with a section on marriage markets. In the process of our initial PRA exercise with a group of women, one participant's husband dragged her by her hair out of the room where the discussion was being conducted shouting, "Why are you wasting your time with these people – lunch is not cooked yet!" Later we heard that she was severely beaten and faced such violence every day. This led to the decision to make domestic violence a focus of the analysis.

In the process of trying to elicit responses on this difficult issue, in the first week our respondents told us, basically, that life was tough but manageable. Their main problems were with the government – lack of good schools, lack of adequate drinking water, etc. But, their husbands were good and families tried to cope with problems as best as they could and helped each other all the time. After a week of staying in the village and continuing our interviews, one of the women finally opened up and said, "You have become our friends and we can't lie to you anymore. Let me tell you the truth. We feel like we are in jail. Our husbands beat us all the time and no one helps when that happens. They spend all the family money on alcohol, and when they come home – no one can help us." We then explored these issues further through in-depth interviews with men and women who outlined the cold rational calculation behind much of the violence. On the basis of these discussions a few key questions on wife beating were added to the quantitative survey instrument. The analysis of the qualitative and the quantitative data demonstrated the links of domestic violence to issues of control and power within the family, alcoholism and dowry demands [Rao 1998]. Since the qualitative work demonstrated that domestic violence was largely caused by agency problems within the household and were often rational choices undertaken to forcibly extract money from the husband's family, it also led us to rethink how economists modelled both intra-household and transfers behaviour [Bloch and Rao 2002].

Without the Participatory fieldwork, we would have never thought of studying domestic violence. Unlike conventional methods, Participatory Econometrics allows issues to be probed in the field the moment they are observed. This permits 'surprises' to be easily incorporated into the data gathering process. These surprises

are often everyday, even mundane, experiences in the lives of the rural poor and are only surprising to relatively affluent outsiders. Development researchers, as affluent outsiders, miss such phenomena because they are absent from the existing literature. The malleability of Participatory Econometrics, the fact that reorienting the analysis on the basis of observations in the field is a key element of the method, adds value to traditional econometric practice by discovering and locating important but understudied issues within the research discourse.

Two more examples from the potters study further illustrate this point. The first resulted from an observation in a PRA that liquidity constraints forced people to purchase food in very small quantities for which they paid much higher unit prices. Since this could have implications for measures of poverty and inequality we investigated this by talking to shopkeepers and observing their behaviour, and probing the issue further in focus group discussions with homemakers. We found that it was a serious problem that households had found ingenious ways to cope with – by seeking credit from friends and relatives and sometimes from shopkeepers themselves, and by occasionally forming shopping clubs that made excursions to nearby towns where food prices were cheaper. However, both credit, and the networks required to participate in shopping clubs, were more easily accessed by the relatively well off.

On the basis of the qualitative work we constructed a survey instrument with a specialised expenditure module that had finely calibrated food categories to distinguish between different quality grades of each product. This allowed us to distinguish between the quantity discount effect on unit prices and the quality premium

effect that goes in the opposite direction – as income increases consumers can not only afford to buy higher quantities of food at cheaper prices but can also purchase better quality food that costs more. Consequently conventional expenditure surveys, where food categories are not calibrated finely enough to sort out quality from quantity effects, can miss the true extent of price heterogeneity. The unit price data we collected in the specialised expenditure survey were used to construct household specific price indexes that allowed real incomes to be constructed. It was found that the quantity discount effect is severe enough in these communities that 'real' inequality is about 23 per cent greater than inequality measured with incomes uncorrected for price differentials [Rao 1997]. Furthermore, the magnitude of the quantity discount effect raises doubts about the efficacy of single-point poverty lines in sorting out the poor from the rich and has implications for public action on food distribution systems.

The second observation that led to a reorientation of the analysis happened quite by chance. We were conducting fieldwork for a few weeks, when we were told one day in a focus group discussion that it would be "difficult to find people tomorrow because they would all be at Marriamma's festival." When we arrived the next morning the village had been transformed beyond recognition. Everyone was wearing their best clothes that they had found scarce water to clean. The women had put on gold and silver jewellery and had jasmine flowers in their hair. Two loudspeakers tied to the village temple's roof blared film songs. And then, at about 10 in the morning, the procession began led by three musicians playing the 'nadaswaram' and four drummers. A bullock cart followed them; pulled by two large

colourfully decorated bulls, carrying an image of the goddess Marriamma swathed in silk and gold. Immediately behind the bullock cart was a group of about 10 important looking men and women who were described as Respected People in the community, followed by hordes of dancing children. I asked some people in the crowd who these Respected People were and was told that they were the heads of those families who had made the largest contributions and had helped organise the celebrations.

The festival was obviously a very expensive event entirely financed by voluntary contributions. We were told that such celebrations were repeated about two or three times a year during various festival periods. Observing the festival helped us appreciate the significant role that collective celebrations play in rural life and led us to investigate it closely in focus group discussions and in-depth interviews. On the basis of these interviews we constructed a short quantitative module that was administered to the community in 1994. Analysis of the data showed that the average household spent 15 per cent of its annual expenditures on festivals. While festivals were important public goods in the village, neither a pure entertainment motive, nor an altruistic desire to contribute to a public event seemed to explain their size. Households who spent more money on festivals, everything else held equal, were, however, able to generate tangible rewards – lower prices on food, higher social status and more invitations to meals from other families. This indicated that active participation in festivals generates private economic and social returns that help resolve a potential free-rider problem. The evidence is consistent with the notion that festivals serve as mechanisms by which communities cement bonds across families and thus build the social cohesion necessary to facilitate collective action [Rao 2001].

Thus, an initial interest in marriage markets evolved in several different directions uncovering understudied phenomena that were of signal importance in the lives of the people whom we were studying. Moreover, the subjects of the research, with their participation in PRA/PPAs, focus group discussions, and in-depth interviews played an important role in how research questions were defined making an important contribution to the analysis and informing the econometric work. The econometric analysis tested the generalisability

of the qualitative findings, measuring the magnitude of the effects and their causal determinants.

### Added Value of Participatory Economics

(a) *Generating hypotheses grounded in the reality of the poor.*

As the examples above demonstrate, when respondents are directly allowed to participate in the research process the econometrician's work will avoid stereotypical depictions of their reality. This could result in unexpected findings that may prove to be important. Thus, the primary value of participatory econometrics is that hypotheses are generated from systematic fieldwork, rather than from secondary literatures or flights of fancy. More specifically, the use of PRA/PPA, focus group and other methods allows respondents to inform researchers of their own understandings of poverty, which are then tested for generalisability by constructing appropriate survey instruments and administering them to representative samples of the population of interest.

There are, at least, two ways of achieving this integration between the qualitative and quantitative data that I will call 'classical' and 'Bayesian'. When hypotheses are first developed from qualitative information and then tested with quantitative data, with no feedback mechanism, this falls exactly within the practice of classical statistics. Economists may choose to add the intermediate step of constructing theoretical models on the basis of qualitative findings, and then testing predictions from these models with quantitative data [Rao 1997]. Bayesian integration involves a more iterative process. Start with qualitative data collection and construct a survey questionnaire. Then, on the basis of what one finds, revisit the community to correct doubts and potential mis-interpretations. This may involve another quantitative survey.

(b) *Conversation can take the 'con' out of econometrics.*

Almost 20 years ago Ed Leamer (1983), in a famous article entitled, 'Lets Take the Con Out of Econometrics', highlighted several problems with econometric practice – it was plagued by a lack of replication and crosschecking, and the statistical assumptions on which the analysis was based were rarely tested.<sup>3</sup> While contemporary econometric work suffers less

from these problems, partly because of Leamer's critique, participatory econometrics can be of great value in improving econometrics beyond its obvious utility in generating new hypotheses:

(1) It can be very helpful in understanding the direction of causality and in locating identifying restrictions and natural experiments. For instance in studying festivals, I found that families with young daughters would spend more money during festival seasons to 'display' them to potential suitors. This was uncorrelated with any of dependent variables and therefore provided a good exclusion restriction.

Another example concerns some recent work on the loss in income suffered by sex workers when they use condoms due to a preference against condom use by clients [Rao et al 2001]. The econometric problem here is that it is very difficult to identify such compensating differentials because they tend to be plagued by problems of unobserved heterogeneity and endogeneity. Qualitative work in this case helped solve the problem by locating an instrument to correct for the problem. We spent about half a day visiting brothels in the area where the survey was conducted and discovered that an HIV-AIDS intervention that instructed sex workers on the dangers of unsafe sex was administered in a manner uncorrelated with income or wages, but yet had a great influence on the sex workers' propensity to use condoms. Exposure to the intervention was therefore used as an exclusion restriction in simultaneously estimating equations for condom use and wages to find that sex workers suffered a 44 per cent loss in wages by using condoms.

(2) Qualitative work can also be helpful in understanding the nature of bias and measurement error – it helps to have had tea with an outlier. For example, in studying domestic violence a question in the survey instrument asked if female respondents had ever been beaten by their husbands in the course of their marriage. Only 22 per cent of the women responded positively to this question – a domestic violence rate much lower than studies in Britain and the US had shown. In probing the issue with in-depth interviews we discovered that the women had interpreted the word 'beating' to mean extremely severe beating – when they had lost consciousness or were bleeding profusely and needed to be taken to the hospital. Hair pulling, ear twisting, etc, which

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# **EPW Research Foundation**

The following additional vacancies have arisen for the Data Base projects jointly undertaken by the EPW Research Foundation (EPWRF) in collaboration with the Indira Gandhi Institute of Development Research (IGIDR) and ICICI Ltd.

1. One post of Senior Research Officer with compensation of Rs 23,500 to Rs 25,000 per month, all inclusive gross.
2. Two posts of Research Officer with compensation of Rs 16,000 to Rs 17,000 per month, all inclusive gross.

For deserving candidates, some extra compensation for house rent may be considered. Otherwise, the gross remuneration is all inclusive.

## ***Qualifications and Experience***

For both these positions, Ph.D. in Economics with a thorough grounding in Economic Statistics and proven ability to undertake independent empirical research are essential. Candidates for position 1 must have experience of organising and handling research projects independently and those for position 2 must have a minimum of two years' research experience. Academic qualifications may be relaxed for candidates found exceptionally suitable for the Project. Persons desirous of coming on deputation from their present employment can be considered.

## ***Terms of Recruitment***

Recruitment to the above positions will be on contract for two years. The initial appointment will be for one year and will be extendable for one more year at the discretion of the Project Director.

Those who wish to pursue a long-term career with the EPWRF may note that the Data Base projects are likely to continue. There would also be other comparable or even senior positions within the institution in the years ahead. Persons committed to the EPWRF could be considered for these positions.

Those wishing to be considered may please write immediately to the Director, EPWRF, providing educational and professional details along with a brief write-up, not exceeding 500 words, on the areas of empirical research and data they are comfortable with and on their long-term research/career goals. Last date for the receipt of applications will be May 25, 2002. (Those interviewed and not selected on earlier occasions need not apply.)

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were thought to be more everyday occurrences, did not qualify as beating. Responses to a broader version of the abuse question, comparable to the questions asked in the US and UK surveys, elicited a 70 per cent positive response.

(3) Qualitative data facilitate cross-checking and replication. In participatory econometrics, the researcher has two sources of data, qualitative and quantitative, generated from the same population. This allows for immediate cross-checking and replication of results. If the qualitative and quantitative findings differ substantially it could be indicative of methodological or data quality problems in one or the other. For instance, in some recent work on slums in Delhi [Rao and Woolcock 2001] we are finding that our focus group discussions reveal several narratives of mobility – of people leaving the slums. However, our quantitative data do not show much mobility because the sample does not include households who live outside slums. This indicates an important sample selection problem in the quantitative data that limits its value in studying questions of mobility. On the other hand, the qualitative data gave us the impression that religious institutions were an important source of credit and social capital for the urban poor. This is not visible in the quantitative data suggesting that the finding may not be generalisable to all the residents of Delhi slums but is particular to the families we spoke in focus group discussions and in-depth interviews.

(c) *Qualitative data provide a context and aid in the interpretation of quantitative findings, while quantitative data check the generalisability of those findings.*

Finally, reiterating points made earlier, participatory econometrics allows the researcher to interpret his quantitative findings in context. The more narrative, personalised information provided by open-ended focus group discussions and in-depth interviews helps us understand and better interpret a quantitative result. In the work on domestic violence, for instance, we found a strong positive correlation between female sterilisation and risk of violence. This finding would have been very difficult to explain without the qualitative data which revealed that women who were sterilised tended to lose interest in sex with their husbands. At the same time their husbands tended to suspect their fidelity because of a (unjustified) fear that, since the women were now able to

have sex without getting pregnant, they would be unfaithful. This caused sterilised women to be at much greater risk for violent conflicts within the home. The strong correlation between sterilisation and abuse observed in the quantitative data did not necessarily 'prove' that the qualitative finding was generalisable but, by demonstrating that the average sterilised woman in the population was in a more conflictual relationship, it was consistent with it.

While the value of qualitative work in understanding behavioural questions has been emphasised above, the work on prices demonstrates that Participatory Econometrics can also improve measures of inequality and poverty. By probing deeply, qualitative methods help uncover the worms under the rock of 'hard' measurement. Conventional large-scale surveys are blunt instruments that use blunt techniques to emerge with answers that have broad applicability but may mask a more complex reality. This is particularly true of measures of poverty and inequality that provide a reasonably good sense of the extent of deprivation and inequity at the societal level, but are less effective in understanding the multi-dimensionality of well-being. Participatory econometrics can help us understand not just how many people are below the poverty line, but how they feel about it. [9]

## Notes

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- 1 For other perspectives on mixed methods in development economics see Kanbur (2001), Ravallion (2001) and White (2002).
- 2 I am grateful to Rama Rane and A C Komala who helped conduct the fieldwork for the project and contributed towards the development of the participatory methods outlined here.
- 3 For more on Leamer in the context of mixed-methods see White (2002).

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