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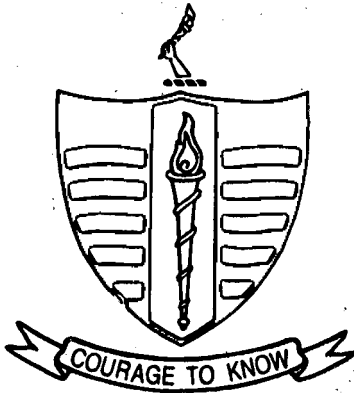
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UNIVERSITIES AT THE END OF THE TWENTIETH CENTURY

By

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The vice-chancellors, professors and lecturers, who each year watch their students file by to receive their degrees, are always tempted to wonder for a moment why these young people are there. Have they come to university simply because a degree leads to a better job - better in terms of interest-satisfaction and income? Are universities simply designed to offer a better personal life to those who get into them and get their degrees? Or do universities serve a wider purpose in which both the personal development of individuals and a more general good are achieved together?

For the last hundred or so years, it has been broadly agreed in the English speaking world that universities have an essential general function in society. Society has invested in them its ambition to fuse the inheritance of the past with the invention of the future. That reflects our collective desire not simply to continue as we are, but to improve: to take our inheritance and make a better world with it just as each generation before us has sought to do.

It is in universities that the knowledge accumulated by previous generations is used to invent the future. Universities are stewards of the past in this sense that they constitute the storehouses of accumulated knowledge and experience in all domains. This is just as much true of hard sciences and technology as it is of humanities and social sciences.

Moreover, as their name implies, universities are universal. They are universal in that they seek to embrace the whole range of knowledge and experience, from the purely spiritual through to the purely material or physical. They are universal also in that they try to embrace knowledge and experience from the many world cultures that lie beyond that particular culture or mix of cultures that makes up distinctively each of our own nations.

Now, if universities were only storehouses, they would not be very interesting or useful. A university is not like a superstore full of electronic goods, where you can pick an item off the shelf and know exactly what will happen when you plug it in. The trouble is that, beyond some rather basic building blocks, there is nothing so uncertain as

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knowledge. What one individual or generation believes to be unquestionably true, another will see as flawed, if not downright wrong. Our own century has seen many appalling examples of that. So, those of us who work and study in universities are constantly engaged in an interrogative dialogue with this accumulated knowledge, including knowledge produced very recently. Our business is to try to distinguish what is only seemingly true from what is true, as best we may determine that at any given moment. Our business is constantly to question what we think we know, constantly to test it against the problems which we pose to it. This is what happens in all parts of universities, whether it be science or technology or arts.

These questions which we put to our knowledge are naturally questions mostly of the present, inspired directly or indirectly by our present concerns. In this way, universities seek to define what we may call the repertory of useful knowledge. What knowledge is useful, and how, is the subject of most academic controversies, quarrels indeed. As I said, nothing is as uncertain as knowledge. That apart, however, what our questions and tests do above all is to generate **new** knowledge as a response. In part, this is discovery, in the sense of revealing the previously hidden or uncovering the mechanism of the previously unexplained. More often, it is a matter of making new sense of what is going on, a matter of giving new and more powerful meaning. This is not just any meaning arbitrarily decided by ourselves; it is arrived at by tests which produce rational meaning that holds true in as diverse and complex situations as possible. We seek an understanding that is as universal as we can manage. This process can quite literally be called the invention of the future, because this new knowledge gained from solving the present problem liberates our potential to know what to do next. When applied to issues of contemporary society, what is liberated is our collective power to act. When applied to matters of technology or science, what is liberated is our ability to understand and enhance human action in the physical world.

Let me sum up the position. Universities stand at the point of contact where the continuous process of society's movement from past to future takes place. They both conserve the accumulation of knowledge, thus preventing us all from having constantly to begin again, and also create new knowledge, thus allowing us to go forward through solving present problems. It is an unceasing process, because each problem solved or obstacle overcome just brings into view the next problem or obstacle. Generation after generation, young people go to universities in order to

learn these skills of using knowledge to solve problems and thus to create the future. Society needs skills and it rewards financially those who have them. In this way, it effectively sends its best young people to its universities. Universities are thus a crucial mechanism in maintaining the development of societies.

This general argument about the functional importance of universities has been held to be generally true for rather more than a hundred years. Indeed, one of my themes here is to insist that it remains basically true. However, over the last ten to fifteen years this perception has been increasingly challenged -- at least, in the USA and UK, the two university systems I know best. What I have to say here is based on those two systems, although I do think that there are clear implications for elsewhere.

The classic function has been challenged, then. It is of course a view that sees universities as producing above all decision-makers, creators, a leadership elite. Naturally, universities have never been wholly such; but there has been a hierarchy of value within universities which has placed creativity, concepts, intellectual problem-solving above technical skills and there has been a general hierarchy among universities where the great ones have been seen to be those with the broad embrace and the lesser to be those more turned to technical subjects with perhaps a few concentrations of particular excellence. Moreover, univerisities have long had professional schools and courses. Nonetheless, we are now beginning to see a claim for universities to be engaged in a much wider spectrum of society's activities; we see this classic functional value questioned; we see a claim for a very diverse as opposed to a homogeneous definition of the university. Universities used to be relatively easily defined in a homogeneous way: they all trained much the same age cohort (18-25) in definable campuses to do broadly the same things through a structured curriculum in order to act in much the same way in and on society. Now, many pressures are taking us towards a university system which includes remote access learning, interrupted and recurrent learning, lifetime learning; towards a university system tightly and directly connected with economic imperatives; and, finally, towards a university system addressing social issues like leisure in these rich societies. Whether there can be a university system as such at the end of this is a serious question.

This change has clear sources. In brief, we may say that universities have been deeply affected by four phenomena that have been intensifying for the last twenty or thirty years. These are: first, structural

social change in rich nations, most especially massive employment shifts consequent upon automation and IT; second, globalisation; third, the increasing volume and complexity of new knowledge; and fourth, the failure of Soviet communism. These four transformations of the world have converged to produce these increasing uncertainties both in and about universities, about what is their true function and value in a society. This general problem is reflected in some more particular and sharp debates about the relative importance of teaching and research in universities; about who should pay for them; about who should direct them and to what ends; about the nature and content of courses, and so on. Indeed, the easiest and most revealing way to capture the general problem I have identified here is to discuss these practical questions. So, let me discuss here three main issues. First, what should be the relationship between teaching and research? Second, who should have access to universities and who should pay for them? And third, should universities be seen as national or international enterprises and where does their future lie?

It is easy to see teaching and research as the expression of the two parts of the universities' general function that I outlined earlier. Thus, teaching appears to correspond with the university's function as preserving knowledge and transmitting it in useful form to each new generation. Research, on the other hand, appears to correspond with the university's function in creating new knowledge and thus inventing the future. This is in fact a serious simplification, as I shall say in a minute. However, it is a distinction that is widespread nowadays and this separation of the university's activity into two different parts has allowed some people to see them as rivals. Indeed, there is now a strong current of thought in North America and Britain that argues that research is the most important thing that universities do. The argument is not that universities ought not to teach, but that research has priority over teaching in the apportionment of effort and finance. The argument is, therefore, that universities are more important to society as creators of new knowledge than as transmitters of accumulated knowledge.

In fact, this is a substantial change in the notion of the function of universities. In the earlier decades of this century, universities were principally concerned with teaching. There were great professors who did profoundly important research. But, this was mostly a personal enterprise, even if it did provide the basis of their teaching. Research brought them reputation, but they were not paid specifically for it. It is true that in the United States at the beginning of the century a few new universities were

founded specifically for research and the teching of postgraduate students as well as undergraduates. The most famous of these are John Hopkins, Columbia and Chicago. However, it was really war that brought research to the universities in a big way: the hot war between 1939 and 1945 and then the Cold War. In particular, the launching of the Sputnik in 1957 transformed universities, especially in America, as money was poured into them to compete with Soviet science. Nor was it just Soviet science: the Western governments believed that their societies were locked in mortal combat with communism and the Americans in particular looked to their univerisites to keep ahead in the race to make their nation not merely stronger militarily, but also economically and socially more successful. Of course, major research was and is done in a variety of organisations of which universities are only one. NASA is an obvious example of a major research agency, and major companies also have their establishments, often large ones. However, in Britain and the USA, universities became over some forty years the largest enterprises for basic research which is the original research behind the progress of applied research. However, as we shall see later, there is now a question about this too.

Thus, as we moved into the 1980s, universities had been profoundly transformed. Their public reputation was increasingly measured by the brilliance of their research. Professors now saw themselves above all in terms of the research they produced and by the critical acclaim it received. Universities competed for professors with brilliant research and outbid each other for them by offering higher salaries. Universities evaluated the performance of their faculty principally on the basis of research production. England diverges from the United States in this one sense only that, until now, there have been national pay scales and so competitive bidding for faculty does not take place. Everywhere, however, although the professor as teacher has been and remains an essential figure in the university, the emphasis has curiously shifted towards the professor as researcher. The tension that many professors now feel between themselves as teachers and as researchers epitomizes the general dilemma of universities.

It is, I think, the collapse of Soviet Communism that has made all this much more problematic. It has done so essentially in two ways. First, especially in the United States, defence contracts have been a significant part (though only a part) of research funding in sciences and, to some degree, in part of the social sciences. There is currently a painful reduction of such contract research. In the second place, the struggle against Soviet Communism had been a very broad enabled of all sorts of

research. In many ways, even though it was not often articulater like this, the assumption had appeared that all research was valuable and worthy of financial support because it was all part of a gigantic enterprise to make Western society better than Communist society. In some cases, this had legitimated some quite extraordinary programmes: for example, Ronald Reagan's Star Wars which appears to have been mostly unsound science. The collapse of Soviet Communism has removed the instinctive predisposition to fund research, and the visible collapse of·Soviet science can only accentuate that. The recent struggle over the cancellation of the gaint particle accelerator in Texas is a dramatic example: it would have been unthinkable fifteen years ago.

University research now faces serious questions about its purpose. These questions are not really new -- they were already there in the periods of economic downturn in previous decades; but they have a new prominence. Although applied technology and contract work have always been signifcant, the heart of research in American and English universities lies in pure speculative research, in the pursuit of a problem because it is complicated. The assumption is that good research produces important results even if one cannot at present either predict what they will be or what practical use they may eventually serve in the future. We have been accustomed to call this "blue sky" research. This is, I think, a reference to the extraordinary number of practical applications that derived from the pure research of the space programme. Significantly enough, the American and British governments now refer to this as merely "Curiosity" research. Indeed, we are now learing a new argument: research ought to be justified principally by its contribution to the creation of material wealth. If this definition were to triumph, to my mind it would be a serous blow to what universities are: you will remember me saying at the beginning that the business of universities is to preserve all knowledge, interrogate it and establish what is true as near as we can. Moreover, to my mind agan, research aimed at the creation of material wealth naturally belongs in industrial and commerical enterprises which market it. However, there is a precise problem with such virginity of principle on my part. Research creating material wealth is research bringing in money, often substantial amounts of money; university pure research needs a lot of money. A separation between the two will, in obvious circumstances, threaten university research with asphyixia. These figures hint at the potential problem: Japan does more of its research and development in universities than any other rich nation, but it is still only 20.1% of the

total: England does 16.5% of its R & D in universities and the United States only 14.8%.

The situation is still unclear in this subject. However, a recent report from the Rand Corporation is alarming. It refers to American universities, but I think the situation is much the same elsewhere. It states that the United States is producing 25% more PhDs than the economy needs, measured by their ability to find suitable employment. This is an average: the worst case is computer science with an overproduction of 50.5% . The question is whether the overproduction of PhDs is a temporary problem linked to cyclical economic downturn: if so, economic recovery would simply reabsorb the excess. For my part, however, I suspect we may have here a structural defect, which cannot be solved even by funding more research in order to absorb the PhDs inside the university system (though this would dangerously convert the production of research students into an entirely internal university market). In fact, I see three developments in the future. First, we must persuade our societies to see the PhD not just as a highly specialist qualification, but as an excellent **general** qualification for high positions in business, industry, administration and society. Second, I think we shall see an increased prominence of current great research-intensive universities as research becomes less well-funded in other parts of the university system. Third, we must develop very much further the international collaborative or integrated nature of university research. We must try to see basic research, such as occurs in universities, as a great international patrimony. Considerations of national interest might hold in the area of applied research. Patent laws exist to protect them. Nonetheless, one has to acknowledge that attempts to make distinctions such as these run straight into the problematic realities of the 1990s. It is increasingly difficult to keep separate "international" and "national", "basic" and "applied". This is especially evident in pharmaceutical research, where great multinational companies are heavily involved in both basic and applied research.

However, there is here another possible future, of which one can also already see clear signs. If we see on the one hand the trend to concentration of significant research effort in a number of universities, we see also, on the other, the growth of non-university research enterprises or, more frequently, interstitial research alongside or loosely connected with universities. It is not clear where this will go. But it is possible that from

the certain competition for resources, there will develop real rivalry between university and non-university research and thus expose more and more the tension between teaching and research as henceforth being discrete activities. It is clear this will be a danger for the function of universities, especially if we can no longer speak realistically of a division between pure and applied research. Certainly, the progressive disappearance of clearly marked disciplinary boundaries in the hard (and also in the social) sciences suggests that traditional categorisations of research are now heading for collapse.

Let me turn now to the other part of the university's double function: teaching. I said earlier that I think it wrong to want to separate the university's function into two distinct activities: the creation of new knowledge (that is, research) and the transmission of accumulated knowledge (that is, teaching). That assumes that the only people creating new knowledge in a university are the researchers and the faculty; it assumes that the only definition of new knowledge is what is discovered by research. I want to suggest to you that students also create new knowledge and that teaching is above all about helping them to do that. The first step in teaching is necessarily to present established knowledge to students and to show how it is applied to precise problems. However, if teaching stops there it is totally insufficient. The true purpose of teaching is to get students to take established knowledge, to interrogate it themselves, to use it themselves against problems, to test for truth in complex arguments and situations, and to find new meanings. Now, this is in effect to create new knowledge. Of course, the business of students is to learn some skills that will enable them to earn a living within the social economy. But, it is much more than that. They have to learn how to use learned or inherited knowledge in the new and unknown circumstances of the future. They have, therefore, to discover how to create new knowledge that obeys standards of truth and accuracy in order to be effective, as well as to sustain moral values of social justice and social coherence. As societies, we depend upon future generations inheriting what we have done that is positive and inventing the future out of it. As I said at the beginning, this is the essential function of universities and it is why societies have learned to value them.

I do not suggest that universities particularly neglect this function. Certainly not. However, there is debate about what should be taught and how it should be taught. The most difficult problem is the question of relevance to the contemporary world. Relevance is very much a matter of definition. Parents and students have as a prime objective the acquisition

of a marketable skill. Therefore, relevance tends to mean degree courses that will provide the student with a skill that can be directly used to earn a living. At times of economic uncertainty, as at present, anxiety is always higher about this issue. This is of course a perfectly reasonable demand. Universities do teach degrees in many subjects that lead directly to skills usable in this way: computer science, engineering, medicine, law, and so on. There is, however, an essential difference -- in America and Britain, at least -- between such courses and direct technical skills. Universities are devoted to dealing with the essence of things. As I have said, they are places of enquiry, understanding and the refinement of the use of reason. High skills for the solution of complex technological problems have their place in universities, especially in the professional schools. However, technical skills that are just techniques (that is, just the application of received knowledge) have usually been taught in separate technical training institutions.

Traditionally, this distinction has not cause difficulty. Society has always valued more highly a university education than a technical one. It has been willing both to employ those from universities and to give them specific work-skills either on the job or in a post-degree professional qualification. Recently, however, and particularly in Britian, we have heard demands from government and industry that universities should be more relevant in a different sense. They are said to be too concerned with abstract and impractical matters; the demand is that they should be directly involved in the development of an entrepreneurial society based on new industries. Clearly, this is a discourse born of anxiety about real or potential economic decline in a competitive global system, and the frequent reference to Japan in this argument reveals that. Nonetheless, one should not dismiss this demand quickly. Indeed, in both US and America, universities should and do seek to increase their commitment to subjects relevant in this sense, as part of their function in society.

However, the argument is ultimately misconceived. The rate of change in technology and production has so accelerated over the last two or three decades that we now know that people will have to learn a complete new set of skills at least twice in their life after education. I conclude from this that the most important thing to learn at university is how to learn. This is precisely what universities do when they show young people how look for knowledge, how to think about it and how to put it to entirely new purposes. There is no special merit in any one subject of university study over another in this respect. Indeed, many argue that the abstract subjects that do not deal with concrete problems of the present are in fact much better at teaching young people these skills. Finally, this current

demand from government and industry for relevance seems to assume that universities should be principally concerned with the creation of material wealth. Of course, any society that does not prosper is unhealthy and every university has a duty to promote prosperity as it can. However, the health of societies depends also upon non-material values: for example, justice, liberty, a common national project, mutual solidarity, a sound value system, etc. This in turn depends upon each generation producing clear-sighted people to take decisions and manage society at different levels. It is the universities which produce these people. That is, I think, a higher function. University education is not about delivering textbook lerning, but about preparing people to have original ideas. This sort of education has to work at the level of the individual. Mass higher education (that is, large numbers of young people receiving higher edqcation) should not be allowed to mean mass production universities (that is, huge university enrolments, very large classes and anonymous teaching such as we have seen in some parts of Europe). The best university education is the one given by teachers, who are themselves active researchers, teaching small groups of students and doing so above all though close debate. The degree to which this is the case is certainly one of the best tests of how great a university is.

Let me turn now to the second large problem I identified: who should have access to universities and who should pay for them? In the 1990s, the situation in America and Britian is apparently the same. Both have mass higher education and both operate a mixed system of state-funded universities and private universities. But, these are superficial similarities. The United States moved towards mass higher education after 1945, first with the GI Bill and then in response to the Sputnik which was seen as the product of a more educated society. Britain, on the contrary, produced rather small extensions after 1945 and 1957 and only moved firmly towards mass higher education in the 1990s. Since 1991 the number of British young people has doubled to 31% of the age cohort. This also has been caused by an unfavorable comparison, this time with the other rich nations whose higher univesity numbers have been taken as one reason for superior economic performance. We have already seen how that comparison has been important in other areas of this topic.

There are marked differences between the two countries also in the distinction between state and private universities. Although Oxford and Cambridge are private universities in the sense that they have endowments which they use to subsidize their activities, in fact they are mainly supported by government grants. All British universities, including

Oxford and Cambridge, receive government money to pay their research and establishment costs. At the same time, they charge fees to students for teaching costs, but these fees are also paid by the state. Finally, the state pays a support grant to each student which diminishes to nothing as parental income rises towards a level about that of the ordinary professional middle class. British univesities are, therefore, in large part-funded universities. In America, things are simpler. Each indvidual state directly pays for its university system, which charges a relatively modest fee. The students pay the fee and fund themselves. Private universities charge very high fees and fund themselves from endowments, gifts and other sources. The federal government (as distinct from the state governments) contributes to both private and state universities through the various programmes supported by federal agencies. So, American private universities also rely to some degree on government funding.

These situations are each product of a specific historic context and a specific culture. In 1945, the Americans gave money through the GI Bill to individuals and costed state universities accordingly. In Britain in 1945, the Labour Government ended universities as the sole preserve of rich gentlemen and middle classes by paying the fees of the less rich. Progressively, they began also to fund directly the increasing costs of Universities. However, are the different systems/also the product of quite different cultural ideas. The American system is based upon the idea that the individual must be left free to seek his own best interest. The best interest of society as a whole is best served by allowing individuals to pursue individual opportunity. University education is, therefore, a mechanism for individuals to promote themselves in society. Affirmative action programmes in recent years for Blacks, women, etc. have aimed to help such individuals forward on the same principle. In Britian, on the contrary, the system has been based in the notion that the common good of society is best served by getting the most talented to serve it after educating them, rather than excluding them for lack of enough money. The benefit to the individual is in this case only a side effect of the main purpose.

It is extraordinary that such different systems should have produced as spectacularly the same effect. Thus, in both the US and in Britain, we see a strong hierarchy of universities in which a small number of top universities capture the best students, offer them the most careful education, and place many of them in the most influential positions in the society. There are of course talented students and brilliant researchers and teachers elsewhere in the system, but by and large the general effect is as I describe. These top universities are predominantly private (but remember

the qualification about Britain), they have remained small compared with other universities, and they are very selective. Their problem is to prevent selection by talent from becoming confused with selection by money or social background. Talent without money or social advanteage does indeed find its way quite easily into these universities, despite what critics say. However, in America at least, it does so at the cost of the university which brings such students in with substantial scholarships out of its own money. In effect, a university like Harvard purchases the attendance of talented students in the interests of its own balance and its own success. Even a lesser university does this: for example, the University of Southern California last year gave $160 million in financial aid to 60% of its students.

Universities are, thus, a hugely expensive business and especially so in the top universities. Fees at Cornell University, for example, have gone up 700% over 25 years, consistently 2.3% over inflation. Modern research is high cost, especially in the sciences; in America, competition for brilliant faculty and talented students further increases costs. One can measure this simply by the full price for study: an undergraduate degree at Harvard costs just about $120,000. A degree from Oxford for a foreigner not paid for by the British government costs just over half that, which seems a bargain. Why should anyone pay such prices for a university degree? Ultimately, they will do so only if the degree offers them an added value. They must, first, earn significantly more with the degree than without it and certainly enough to cover the outlay; second, the degree must give them access to a more influential, prominent or satisfying career than they would otherwise have. A university like Harvard depends therefore upon its ability to produce a high-salaried leadership elite in the United States. Such universities are therefore vulnerable because they must convince that they are worth the price. Americans are very generous both as individuals and corporations in their gifts to such universities. Indeed, in 1994 they gave $ 12.35 billion dollars. While this is certainly significant from time to time for certain universities, it is hardly a sound financial basis for American universities in general: that sum represented only 6.2% of the total expenditure of those universities last year.

Universitites in Britain and America which draw their income from government are just as vulnerable. They too have to convince that the high cost is worth the value of their function to society. I have already quoted several examples in this lecture of the way in which governments and interests in society are beginning to call for some quite different functions for universities. The damage done to the California university

systems by the combination of economic recession and Governor Wilson's change of priorities is a warning. The cost of universities is, I think, a significant challenge for us at the end of this century. In fact, universities now cost governments too much. In a stagnant economy, governments have to choose what to fund: health, education, defence, etc. Governor Wilson withdrew $400 million from the California system in the early 1990s in order to build prisons; the UK government has just cut its building and maintenance grant to universities by 50% and its general support for salaries etc. by about 12% over the next three years. The question is: will universities also prove too expensive for individuals?

Finally, let me turn to the third topic of this lecture: the national or international role of universities. Much of what we still say about universities is rooted in the idea that they are national institutions. The society which we say they serve is essentially our national one. The young people we say they educate are primarily our own. We certainly see them as preserving our own specific national heritage. Governments that want universities to promote economic well-being and material wealth mean the economy and wealth of their national society. Yet, the reality is that much of what universities deal with is not nationally specific. As I said at the beginning, it is an essential feature of universities that they are universal, gathering all knowledge. Science has no nationality. However, the nature of knowledge and access to it have changed dramatically over the last twenty years. On the one hand, rich nations are developing what is known as "the knowledge society"; on the other hand, the technological revolution has produced a globalisation of the exchange of knowledge. There are two obvious consequeces. The first is that rich societies both demand a higher level of education and skills from many more of their citizens and also have very many more opportunities to use knowledge to effect social and economic transformation. The second is that globalisation means that the broad and rapid dissemination of knowledge increasingly produces a common pool of knowledge largely detached from national specificities.

Some people suggest that this development threatens universities. They fear that the Internet will generate so many alternative structures of learning that their role will be greatly diminished. Certainly, universities must work hard to accommodate remote-access learning. However, it follows from much of what I have said today that universities and their teaching must be defended in the high function I have described, but also that, provided universities and governments act carefully, nothing can or will replace them. On the contrary, I believe that this globalisation defines the future for universities and the opportunity for them. It is clear that

universities must continue to serve the interests of the national societies in which they stand. They must continue to produce each next generation of leaders and to do so better by drawing more and more on this global reservoir of knowledge. They must also continue to preserve the culture and identity specific to each society. At the same time, however, I believe that the small number of great universities, to which I have already often referred today, are likely to become the elements of a great supranational university system. The trend is already there. Complex research is already essentially an international enterprise: no single university has the resources in scientists or money to undertake by itself such large-scale research. At the end of this century, no university can claim to work in all subjects. Furthermore, those universities admit increasing numbers of talented students from other countries. This trend must continue and such universities must explore the ways in which they can become more and more integrated, without losing the national part of their vocation.

This at least is a positive and welcome future. I have said in this lecture that the highest function of universities is to equip each new generation to invent the future. I have said that universities produce those who will make the choices upon which the future depends. I have said that their capacity to lead depends not only on their technical skills but also and above all on their understanding of justice, liberty, mutual solidarity, sound value systems, etc. In our global future, I believe that such a supranational university system must and will play a vital part in producing world leaders who have these qualities. Globalisation as a phenomenon carries not only great benefits for prosperity and peace but also great dangers of global error. It is essential that those who will make the great decisions of the future should understand the nature of the world and combine the most positive values of each part of it. The basis for this can best be laid by educating these people together in this university system that I see in the future. The more our great universities work together and educate each other's talented students, the more likely we are to avoid the appalling mistakes that all the rich nations have made during this century.

POWER AND CONFLICT IN FAMILY —
A RATIONALISTIC PERSPECTIVE

By

Karamat Ali*

The concepts of power and conflict have their origin and usual application in the literature analyzing community and national scio-politico-economic system. But these concepts have been successfully applied by sociologists for explaining complex organizations, group behaviour, dyadic relationships and family decisions.

In this paper, an attempt will be made to use these concepts for explaining family relationships (between wife and husband) in a rationalistic perspective. But before embarking on explanation of this crucial, sensitive and controversial but important social problem. It is essential to point out that social phenomenon can not be exlained in t tal by a rationalistic approach. One can illustrate, one's point of view best and, social phenomenon clearly, difinitely but partially by applying rational model and explaining social behaviour in terms of porfits, costs and benefits. Rationalistic formalization leads to interesting, important and different results from those as usually held by sociologists. But thrust of this perspective and formalization may lead to unjustified and misleading conclusions. Human beings are rational but not calculating as computer. Social relationships are more complicated, uncertain and subjective than the solutions of mathematical equations. So the rationalistic models should be used with caution and keeping in view their limitations.

The term power here will be used not in the sense as used in family literature of making decisions about buying a car, rentng a

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house or sending children to a particular school. But in terms of the time allocated by wife and husband in different activities. Power will be indicated whether wife and husband are playing the stereotype roles in family activities or have been able to get rid of it. It can be argued that by getting rid of stereotype roles the wife has been able to gain power and the husband bas lost it. Subjective satisfaction and dissatisfaction in playing stereotype roles are a matter of socialization process and part of oppressive social system and does not enter into the discussion.

Task activity and time budgeting here are used as an indicatior of power and not as its determinants. Moreover, no effort here is being made of calculating any coefficient of power. Task performance of a husband in a role area contrary to traditional sex role norms indicates a lack of power on the part of that husband because the husband is doing a job which is not considered his responsibility and the wife has been able to direct his action according to her wishes of being a liberated woman having equal rights and sharing all responsibilities.

Power will be determined by the following three factors:

(i)   contribution to current family resources:
(ii)   alternative resources available and
(iii)   cost involved in breaking family relationship.

The most important factor in this respect is the alternative resources available because alternative resources available in fact determine the dependence and power in relationships. The most obvious example in this respect can be cross-cultural comparisons. In rural areas of developing countries women not only work at home but also spend a lot of their time in helping in family's agricultural activities. in terms of their contribution to the resources of family, their share is really good enough to make them less dependent on their husbands as compared to women in urban areas of these countries or in developed countries. But the facts are contrary to this because women in rural areas of developing

countries lack alternative resources totally and the cost involved in breaking family relationships is very high.

The relationship between power and these three variables can be expressed in the following functional form:

$$P_w = f(CR_w, AR_w, CB_w) \text{-------- (i)}$$
$$P_h = g(CR_h, AR_h, CB_h) \text{--------- (ii)}$$

where

P_w	=	power of wife
CR_w	=	contribution of wife to current family resources
AR_w	=	alternative resources available to wife
CB_w	=	cost of breaking family relationship for wife
P_h	=	power of husband
CR_h	=	contribution of husband to current family resources
AR_h	=	alternative resources available to husband.
CB_h	=	cost of breaking family relationship for husband

Power of wife is positively related to contribution of wife to current family resources. If her contribution is greater in family resources, her power will be greater also. Alternative resources available to a wife are also positively related to the power she enjoys in the family. Cost of breaking the family relationship is negatively related to the power of wife. If the cost of breaking family relationship is high, the power of the wife will be lower. Similarly all the relationships between these variables are true for the husband. The determinants of these variables which determine the power of a spouse in family will specify these variables. But before proceeding further, it is important to specify and identify our dependent variable, that is, power.

The usual definition of power is that when person "A" can direct the activity of person "B", "A" has exerted power over B". Now usually, it is the husband who wants to keep the status quo and wants the wife to play stereotype roles. On the other hand, it is usually the wife who wants to   get rid of these stereotype roles. It

the wife can make it, then she has exerted power over the husband by directing his activities. The best indicator in this respect can be the proportionate time the wife puts in stereotype household activities such as cooking food, cleaning house, taking care of children, washing dishes and clothes. Out of the total hours needed for these household activities, how many hours are the share of wife and how many of the husband will be our dependent variable, that is, power. We can express it as the following:

$$P_w = \frac{\text{Number of hours put in stereotype household activities by wife}}{\text{Total number of hours spent in household activiies}}$$

$$P_h = \frac{\text{Number of hours put in stereotype household activities by husband}}{\text{Total number of hours spent in household activiies}}$$

The contribution of the wife towards family resources are her income, total number of hours she puts in household activities and love and affection she provides to family members. It is not difficult to quantify the total number of hours she puts in household activities. Rather, one can convert these resources into money terms by multiplying these hours with the minimum wages paid in the labor market. The question of quality of household activities can be easily dealt by increasing the hourly wages by a certain specific standard from household to household according to the certain characteristics of the family. The only ambiguous variable in this respect is the love and affection provided to family by the wife. It is difficult to specify it, but certain indicators can help in forming a scale in this respect. These relationships can be expressed as follows:

$$CR_w = f(I_w, HH_w, LA_w) \text{------ (iii)}$$

where

Cr_w = contribution of wife toward current family resources

I_w = current income of wife

HH_w = hours spent in household activities by wife

LA_w = love and affection provided to family by wife

Similarly for husband, one can write the relationship as follows:

$$CR_h = g(I_h, HH_h, LA_h) \text{------- (iv)}$$

All the independent variables in this functional expression are positively related to dependent variable.

Let us now turn to the variables determining alternative resources available for a spouse, that is, AR.

$$AR_w = q(E_w, O_w, A_w, NC_w, AYC_w, NM_w) \text{------(v)}$$

where

AR_w = alternative resources available to wife
E_w = education of wife
O_w = occupation of wife
A_w = age of wife
NC_w = number of children
AYC_w = age of the youngest children
NM_w = number of times married before present marriage

Similarly for husband, the relationship can be expressed as follows:

$$AR_h = p(E_h, O_h, A_h, NM_h) \text{-------- (vi)}$$

Education of a spouse is positively related with the alternative available resources. Higher education of a wife means that in case of break of family relationship, she has a good chance of getting a job or getting married again. Occupation and alternative available resources have also positive relationship. Age, number of children and age of youngest children are negatively related to the dependent variable. Number of times married before present marriage is related to the alternative resources available in the sense that if one is never married before, then alternative resources are good in terms of getting married again after breaking this marriage. But if it is one's second or third marriage, then chances of getting married after breaking relationship are lower. So

number of times one is married is negatively related to the alternative resources available.

Cost of breaking family relationship for wife is determined by the alternative resources available, culture and tradition of society, rules and regulations concerning divorce and remarriage, hushand's education, income, occupation and other social resources. It can be written in the functional form as follows:

$$CB_w = (AR_w, TC, RD, RR, RH) \text{--------} (vii)$$

where

CB_w = cost of breaking family relationship for wife
AR_2 =. alternative resources available to wife
TC = traditions and culture of society
RD = rules for divorce
RR = remarriage rate after divorce
RH = all type of husband's resources

If alternative resources available to wife are higher, then the cost for breaking family relationship is lower and vice versa. traditions, culture, rules and procedures of divorce will determine the cost of breaking family relationship in substance........lengthy and tedious procedures of divorce means higher cost for breaking family relationship. If divorce is considered nearly sin in a certain society, then the cost is too high. Remarriage rate is negatively related to cost, because higher remarriage rate in a society means that society accepts the divorce as a usual phenomenon. Lower remarriage rates indicate higher cost. There are societies in which it is nearly impossible to get remarried after divorce. In such cases, cost is too high. Resources of husband are positively related to the cost, that is, higher the resources of husband, the higher the cost and vice versa.

These relationships for husband can be expressed as follows:

$$CB_h = (AR_h, TC, RD, RR, RW) \text{------} (viii)$$

Now Substituting equations (iii), (v), and (vii) in (i):

$$P_w = f(L_w, HH_w, LA_w, E_w, O_w, A_w, NC, AYC, NM_w, TC, RD, RR, RW) \quad \text{-(ix)}$$

Similarly, substituting equations (iv), (vi) and (viii) in (ii):

$$P_h = f(I_h, HH_h, LA_h, E_h, O_h, A_h, NM_h, TC, RD, RR, RW) \qquad \text{-(x)}$$

Power in family is not taken as fixed here and it is divided between husband and wife. But an increase in power of one leads to a decrease in power of the other. When power increases, one may get more share out of the increase than the other, or the power is distributed equally.

Conflict in family is related to the utility or satisfaction of the family members. There is negative relationship between the conflict and satisfaction. One can express it as:

$$C \quad = \quad f(U_w, U_h)$$

where

$$
\begin{aligned}
C &= \text{conflict in family} \\
U_w &= \text{utility of wife} \\
U_h &= \text{utility of husband}
\end{aligned}
$$

Satisfaction of both family members, that is, husband and wife is positively related to the power each has in family. Increase in power leads to increase in satisfaction. It can be graphically represented as below:
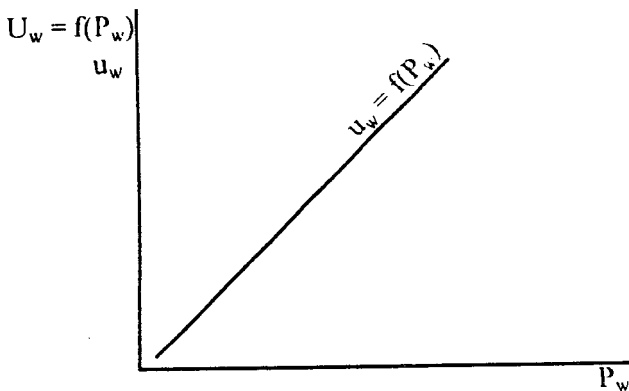
There are two points to be mentioned while explaining these relationships. The first is that there may be wives who feel more satisfied with less power and performance of stereotype role. They are happy and contented with their fate of being adjusted and accepting the social system as it is. But objectively, from point of view of women's liberation organization or any liberal person, only wives are not supposed to do these stereotype household activities, but husbands should share them equally. Subjective satisfaction, dissatisfaction, acceptance of status quo and repressive social system happily by wives is similar to the argument always put forward by the people enjoying more power in the socio-economic system and interested in keeping status quo. In this case, they are usually husbands. Acceptance of repressive system and maintenance of status quo does not enter in the discussion here.

The second important point is that utility is not a linear function of power. The slope of the curve depends on the type of personality one has. But usually it will be that there will be diminishing marginal utility with the increase in power and the graphic representation will be as follows:
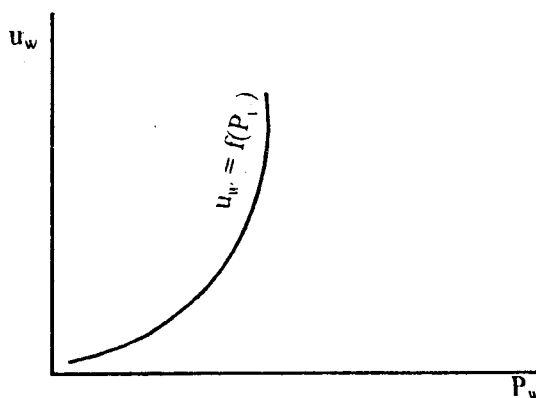
Mathematically the above discussion can be represented as

$$dU_w/dP_w = KP_w \propto^2$$

where

dU_w = change in utility of wife
dP_w = change in power of wife
K = constant

The utility function represented here is the usual Cobb-Douglas function where:

$$U_f = P_w^\alpha P_h^\beta$$

Concluding, one can say that the slope of the curve will be different with different types of personality of wives. This answers our first point also as raised by some people regarding subjective satisfaction and dissatisfaction of wives.

Utility of husbands in relation to power can be explained in the same way.

$$U_h = f(P_h)$$

Power of husband and power of wife are inter-dependent. As the power of wife increases, power of husband decreases and vice versa. It can be represented graphically as follows:
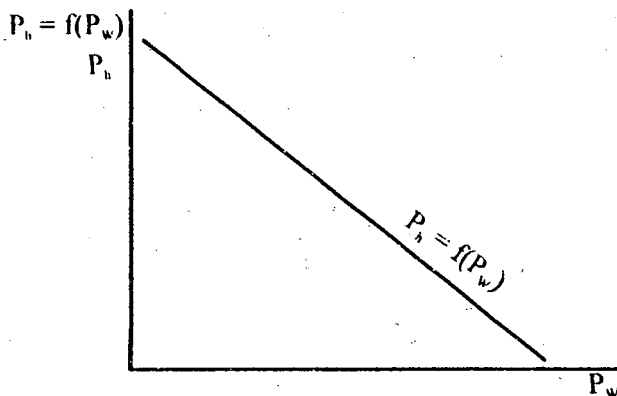
$$p_h = f(P_w)$$

Similarly $P_w = f(P_h)$
so $U_w = f(P_h)$
               $U_w = f(P_w)$

This can be represented graphically as follows:
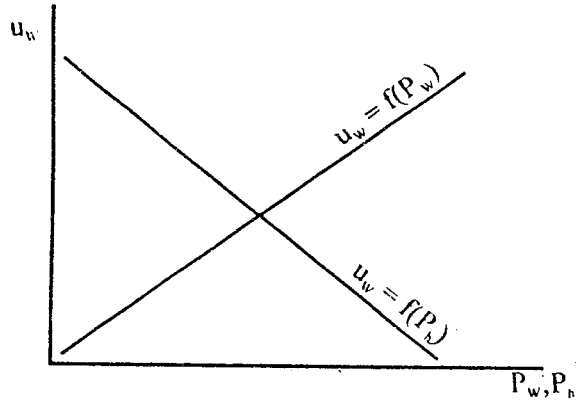
A similar graphic representation relating utility of husband with respect to power of wife and as power of husband will be as follows:
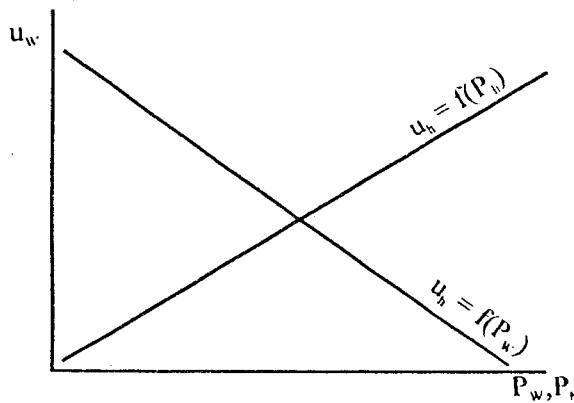
Now these two figures have to be combined to show the utility of husband and wife both with certain distribution of power. Dissatisfaction with distribution of power will be an indicator of conflict in family. One may represent the combination of the above diagrams in a following box diagram.
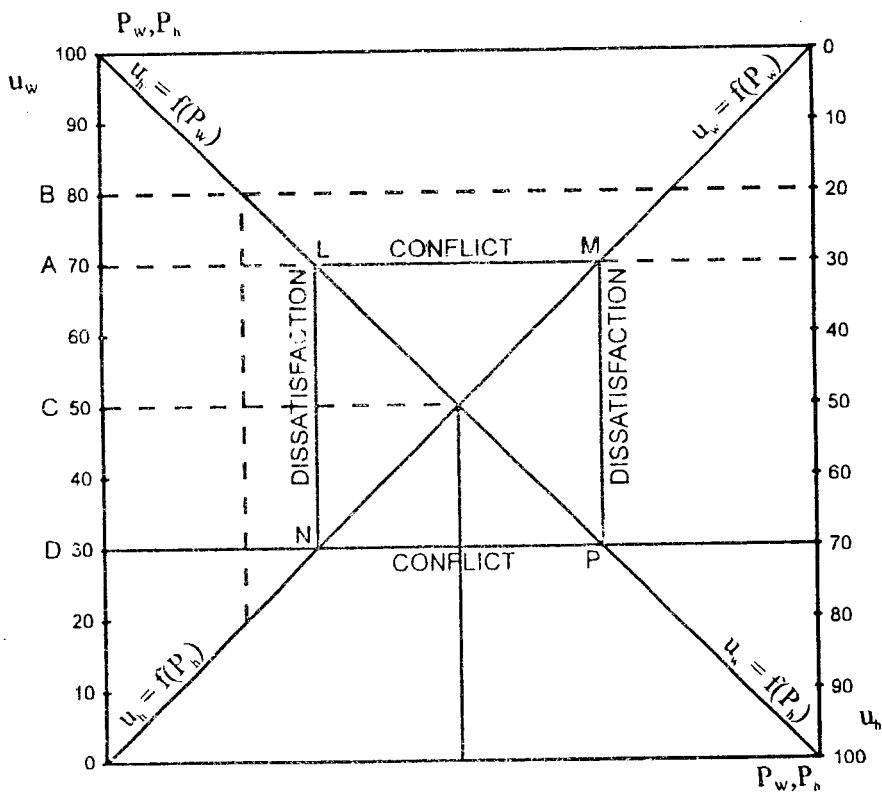
The determination of conflict and dissatisfaction of a spouse with the distribution of power can be easily measured in this diagram. Utility units assigned are just arbitrary to make explanation more clear. Let us start with point `A'. At this point, power of wife is greater than power of husband by the distance called as `LM'. The utility of wife is 70 points and the utility of husband is 30 points. The difference between the utility points will indicate the dissatisfaction of husband by the distance `LN'. So `LN' will be dissatisfaction of husband with the distribution of power and `LM' will be the distance measuring conflict. As one moves to point `B', the dissatisfaction of husband increases and conflict also increases. At point `C', there is no dissatisfaction and there is no conflict. One can call it an equilibrium point or no conflict or on dissatisfaction point. At point `D', husband has greater power than wife and wife is dissatisfied and there is conflict.

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EXTENSIVE AND INTENSIVE GROWTH PATTERN
OF
MAJOR CROPS IN PAKISTAN

By

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Introduction:

Agriculture in Pakistan continues to be one of the most dominant economic activity during the last thirty five years. It provides a way of life to more than 70% of the population and employment to about 50% of the total labor force. It accounts for more than 24% of the GDP. More important is its contribution towards exports earning i.e. more than 70 per cent.

Agricultural growth in the 1960's was respectable[1]. It is well recognised that such an achievement was the result of Green Revolution. Special importance was given to agriculture during the first three development plans. During the First Plan its growth was 2.5%. During the Second Plan (1955-60) its growth was 3.8%. The same was further accelerated to 6.3% during the Third Plan (1965-70) i.e. more than double than that of the population growth rate. It is observed that since then agricultural growth slowed down, as did the spread of Green Revolution[2]. During the 1970's the growth of the agriculture sector was only 2.4% i.e. less than the population growth rate. During the 1980's some improvement was made by achieving a growth rate of 5.4%. However, it continues to fluctuate from over 9% during 1991-92 to 3.9% during 1992-93. Due to this uneven progress and fluctuations, Pakistan is still unable to meet the domestic demand for food items like wheat, pulses and edible oil. Now, it has also started to import meat due to its insufficient supply at home[3]

Since agriculture is the backbone of Pakistan's economy and if it continues to suffer from fluctuation, then it may never be able to cope

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with increasing shortage of food, as a result spread of hunger and poverty
is unavoidable. Therefore, it is important to investigate which factors are
contributing to accelerate or deteriorate its growth[4]. By identifying such
factors a remedy may be proposed to improve the conditions. To achieve
this objective this study is focused to find out main sources of growth for
major food and commercial crops. To this extent, this study is organized
as under. Part II provides theoretical background and a review of
important studies appeared in the literature so far. Besides, methodology
to study the factors contributing to output growth of major crops is also
discussed in this part. Part III deals with estimation of the sources of
growth and its implications. Part IV is a conclusion of the study.

PART-II

Theoretical Rationale and Literature Review

In agriculture the basic and foremost inputs are land, labor,
modern inputs like HYV's, fertilizer, pesticides and capital. The labor
plays an important role being tenant and owner of the farm. The capital
facilitates to buy modern inputs like seeds, fertilizer and tools etc. All of
these inputs do play a significant role in enhancing agricultural output.
The use of these inputs is also complementary in nature [Aslam Ch. and
Rukhsana P., 1995]. Moreover, the output may also be altered by
techniques like crop rotation or cropping pattern. As already pointed out
that the role of core inputs has not been properly identified in accelerating
agricultural output. All over Pakistan, some inputs are even used without
the study of their scientific justification for example, which kind of
fertilizer is appropriate for specific land. Besides, farmers are hardly
aware that how much fertilizer need to be applied and what combination
of water will be optimal. Moreover, lack of capital to buy modern inputs
is another constraint. As a result agricultural sector has not experienced
stable growth. The contribution of these inputs is also widely disagreed
[Ahmed and Amjid 1985, Aslam M.C. 1989, 1994 and M.H. Khan 1981].

As already mentioned that there is substantial literature on the
sources of agricultural growth at aggregate level, [Aslam 1976, Wizwat
1981, Burney 1986 & Chaudhary 1989]. However, the sources of growth
for individual crops have already been highlighted. As per our knowledge
there is no recent study on the subject matter. Khilji in 1988 estimated
production elasticities by using aggregate production function in linear
and log linear form. This study pertains to 1956-85. The study focused on

the inputs like land, labor, tractors, tubewells and draught animals. It pointed out that there existed decreasing return to scale in agriculture. The elasticity of output is negatively affected by changes in land, labor and draught animals. However, the same is positively affected by changes in tubewells and tractors. Kemal (1993) identified that the productivity of land and labor in agriculture increased by 2% and 1.3%, respectively, over the period of 1956-91. The total factor prductivity grew by 0.78% per annum. The study covers almost all major inputs and their contribution. However, factors like cropping pattern and hectereage effect have been neglected which will be covered in our study. Besides, these studies also dealt at aggregate level. Such identification at crop level is missing too.

Khan (1981) focused on major crops in Punjab and Sindh: wheat, rice, cotton and sugarcane. His sources of growth for these crops were yield affect of HYVs fertilizer and cropping pattern etc. His results showed that cropping pattern made a negative contribution for wheat during 1970's. The yield effect was more for wheat and rice than that of cotton and sugarcane. We will compare our findings with this study to see whether there is any shift in the same during the recent years. Khan's study covered the period up to 1970's, whereas our will be updated upto 1994-95 and in addition to major crops, an analysis of food and commercial crops will also be carried out.

Khan and Siddiqui (1982) focused on pinpointing the fluctuation in the output growth of major crops. The crops analyzed were wheat, rice, cotton and sugarcane. They found that yield effect had major contribution for wheat and rice. The impact of area was also found different for Punjab and Sindh. The major source for growth of sugarcane was acreage effect. The study was limited to only few sources of growth and ignored factors like cropping pattern and cropping intensity etc. Besides it is also outdated. Our present study is improved by incorporating these variables and providing up to date information.

There are four major crops, wheat, rice, cotton and sugarcane, which occupy about 65% of the total cropped area in Pakistan. These crops contribute more than 70% of the total crop's production. There has been an increase in the area under different crops. However, recently, irrigation has not increased much. The area under cultivation has widely fluctuated over time. Therefore, it is interesting to find out their pattern of growth over time. Besides, increasing share of maize and due to its

importance, it has also been made a part of this study. The technique utilized to study the contribution of above cited factors is as follows:

Methodology/Model

As already stated that there are several factors which are important to study their contribution towards enhancing agricultural output. By disaggregating their contribution we can see the impact of each factor. M.H. Khan (1981) conducted a comprehensive study of the Indus Basin, which covered the period upto 1977. Khan (1981) estimated the sources of individual crops by utilizing the following technique:

$$Q_1 - Q_2 = [(A_1 - A_0) \times (Y_i \times C_i)] + [Y_{i1} - Y_{io}) \times (A_i \times C_i)]$$

$$+ [(C_{i1} - C_{io}) \times (A_i \times Y_i)] \quad \text{------------} \quad (1)$$

where 'Q' is output of the ith crop, 'A' is crop area, 'Y' is yield, 'C' is percentage area of ith crop in total cropped area "i" is specific crop; where 'o' and '1' are base and terminal periods, respectively. The first second and third terms in above equation represent Hectereage effect, yield effect and cropping pattern effect, respectively. To study the contribution of land and labor and their impact is analysed by regression method. It is measured by partial productivity approach i.e. output per unit of land and per person. This technique helps to identify the variations in the relationship between the factor endowment. We follow Hayami and Ruttan (1985) to study this phenomenon. The labor productivity (Y/L) can be decomposed into land/labor (A/L) ratio and land productivity (Y/A).

$$Y/L = (A/L) \times (Y/A) \quad \text{------------} \quad (2)$$

By taking log of the both sides the linear relationship will be as follows.

$$\text{Log } (Y/L) = \text{Log } (A/L + \text{Log } (Y/A)) \quad \text{----------} \quad (3)$$

Where 'Y' is output, 'L' Labor and 'A' cultivated land.

To point out the significance of the variables of Green Revolution, following regression is estimated.

$$Log(Y/A) = +\alpha Log(F/A), + \beta_1 \log(C/A) + \beta_2 \log (S/A) \text{------} (4)$$

In this model 'F' stands for fertilizer, and 'S' for HYVs. All other variables have already been explained. The results of the equation 1-4 are discussed in the next Section.

PART-III

Empirical Findings:

Table 1 provides empirical results pertaining to hectereage effect, yield effect and cropping pattern effect. These results are estimated from 1959/60 to 1994/95. The table has been derived from the table given in appendix-I. For convenience of discussion and comparison, yearly percentage contribution of these variables has been provided. As theoretically expected, the combined effect of these three variables add up to hundred percent, as shown in the appendix table. Five major crops have been analyzed. These are the major food and commercial crops. Besides, the aggregate results pertaining to food grains are also provided.

Wheat is one of the most important food crops. the pattern of its growth widely fluctuated since 1959/60. So far as the expansion of area under wheat crop is concerned it significantly increased during the 1960's and 1980's i.e. about 6% and 5.5%, respectively. However the same grew by only 2.6% during the 1970's. Furthermore, the same change, since 1984/85 -to 1994/95, was only 2.3% per annum. Overall long run empirical results were discouraging. The average annual change since 1959/60 was only 1.1 percent. The yield of this crop was significantly growing since 1959/60. As a result, it was expected that more area will be brought under its cultivation.

The yield effect for wheat continues to increase since 1959/60, except a slowdown during the 1980's. However, it again picked up during 1984-85 and emerged to grow satisfactorily. It is the only crop which has yield effect more than the average annual growth of population. As far as, cropping pattern is concerned it did not grow significantly. Such an effect was negligible or even negative for some years. It indicated that its overall share in cropped area did not increase much. In other words it did not deviate much from the pattern of its cultivation.

Table 1

Contribution to Output by Source

(Percentage per annum)

Crop	year	Contribution to Output of Major Crops.		
		Hectereage Effect	Yield Effect	C.P.Effect*
WHEAT	1959-60-1969-70	5.9	3.8	0.4
	1970-71-1979-80	2.6	7.8	0.3
	1980-81-1989-90	5.5	5.0	(-)
	1984-85-1994-95	2.7	7.0	0.4
	1959-60-1994-95	1.1	4.7	0.1
	year	Hectereage Effect	Yield Effect	C.P.Effect
RICE	1959-60-1969-70	2.0	4.0	2.0
	1970-71-1979-80	6.2	1.0	3.0
	1980-81-1989-90	15	(-)	(-)
	1984-85-1994-95	1.1	(-)	(-)
	1959-60-1994-95	1.5	0.7	0.6
	year	Hectereage Effect	Yield Effect	C.P.Effect
MAIZE	1959-60-1969-70	8.6	N	1.3
	1970-71-1979-80	6.2	7.3	(-)
	1980-81-1989-90	6.0	4.1	N
	1984-85-1994-95	5.1	8.9	(-)
	1959-60-1994-95	4.6	0.9	0.3
	year	Hectereage Effect	Yield Effect	C.P.Effect
	1959-60-1969-70	4.5	3	2.5
	1970-71-1979-80	5.6	3.3	1.1
	1980-81-1989-90	6.0	6.6	1.1
	1984-95-1994-95	5.1	5.1	1.3
	1959-60-1994-95	3.1	3.4	1.0
	year	Hectereage Effect	Yield Effect	C.P.Effect
SUGARCANE	1956-60-1969-70	3.7	3.9	2.6
	1970-71-1979-80	1.3	18.5	(-)
	1980-81-1989-90	4.4	7.3	(-)
	1980-85-1994-95	2.3	5.4	2.2
	1959-60-1994-95	2.0	5.0	N
	year	Hectereage Effect	Yield Effect	C.P.Effect
ALL FOOD GRAIN	1959-60-1969-70	2.8	6.4	0.8
	1970-71-1979-80	0.5	9.6	0.1
	1980-81-1989-90	6.6	3.4	1.2
	1984-85-1994-95	0.5	1.2	(-)
	1959-60-1994-95	0.6	2.3	(-)

- Calculated by the author.

* Croping pattern effect.

Maize is another important food crop which not only provides food grains but it also fulfills substantial demand for edible oil. Pakistan being importer of edible oil, this crop has gained much importance. The hectereage effect for maize was negligible during the 1960's. It increased during the 1970's and again decreased during the 1980's. However, this effect was significant during 1984/85. The area under this crop is not substantial, therefore, cropping pattern effect was not expected to grow much. In the light of above, it may be stated that maize emerged as a dynamic crop which experienced both hectereage and yield effect.

Sugarcane is another important crop which is complementary to food items. The hectereage effect fluctuated for this crop. The annual hectereage effect for sugarcane was 8.7%, 1.3% and 4% for the 1960's, 1970's and 1980's, respectively. From 1984/85 to 1994/95, the same effect was almost 2.3% per annum. However, overall this effect was satisfactory. As far as yield effect is concerned, it was 3.9% during the 1980's, it accelerated to 18.5% during the 1970's and again slowed down to 5.4% during 1984/85 to 1994/95. It indicated that the yield effect was significant. Although the cropping pattern effect was not very encouraging. but it was still better than other crops. Thus, it is the only crop which emerges having all the three effects significant.

Rice is not only food crop but is also a commercial crop from which substantial foreign exchange is earned. The relative hecereage effect was 6.2% and 15% per annum during the 1970's and 1980's, respectively. The same was negligible during the 1960's. The same is confirmed while analyzing cropping pattern effect which was also either negative or negligible. Since it is one of the most important crops, thus, substantial attention was paid to raise its productivity and area. However, its yield grew significantly during the 1960's, it showed down during the 1970's and became negligible during 1984/85 to 1994/95. Considering yield effect during 1959/60 to 1994/95 the results showed that it was less than one percent per annum. Thus, it may be concluded that during the last two decades, the yield effect has been negliglible, cropping pattern effect was also absent and hectereage effect was also not very encouraging. Thus, the overall performance of this crop was slow in the previous two decades.

The ranking of commercial crops indicates that cotton is at the top. The growth of this crop was stable as compared to other crops. On average, hectereage effect continued to be over 4.5% per annum during

1959/60 to 1979/80. It slowed down during the 1980's and it slightly improved during 1984/85 to 1994/95. Considering last 35 years performance, its growth was over 3% per annum. The yield effect was also satisfactory throughout the last 35 years. The cropping pattern effect for this crop was also better although not very substantial. It was over 2% during the 1980's and over 1%, per annum, during the last 25 years. Due to an attack of diseases, the productivity of this crop has been slowed down, recently. If such diseases are not controlled, its future will be in danger.

ALL FOODGRAINS

Food crops have been given the highest priority so that country could become self-sufficient in food grains. Our analysis based upon the combined effects for food grains indicated that hectereage effect was evident to some extent. It was significant during the 1980's and negligible during the 1970's, early 1980's and during the early 1990's. Overall during the last 35 years, it was not very encouraging. It is confirmed while considering cropping pattern effect which was minor during the 1960's and 1970's, but it disappeared during 1984/85 to 1994/95. There was significant yield effect during the 1960's and 1970's. It decreased during the 1980's and reached to a negligible point during 1984/85 to 1994/95. It confirms the findings of several other studies [Aslam 1992] that the impact of the Green Revolution has slowed down during the late 1980's and 1990's. The annual increase in yield was hardly over 2% since 1960, the very reason for not achieving food self-sufficiency. The absence of cropping pattern effect, very little hectereage effect and slowing down of yield effect in the last two decades are supported by the empirical evidences for its poor performanc. Our results also confirm that the major sources of growth slowed down since the late 1980's. It warrants attention of the policy makers to divert resources to agriculture so that these important crops could be put again on the path of progress. Similarly, paying proper attention to stimulate the above cited effects could also help to achieve self-sufficiency in food.

Modern Inputs and Productivity Growth

As already pointed out that the modern inputs are the core factors to enhance productivity (yield). The above cited effects are also dependent upon the use of modern inputs. Thus, we have estimated the inputs equations already explained in the previous section. The results obtained

are reported in Table 2. The agricultural production was tested against, irrigation/cropped area, application of fertilizer and the use of HYVs. The log linear results indicated that irrigation and fertilizer were significant at less than 10% level of significance whereas HYVs were not very significant for the period 1972-95. Thus HYVs were dropped from the equation and it was estimated again. The results for fertilizer and cropped area were improved and significant at less than 10% level of significance. The R^2 was 0.97and DW was 2.2 for long run analysis. For the sample size 1985-95 (Table 2.B) indicates that only irrigation was significant variable.

An Index for the output of food grains and the same explanatory variables were also tested in the log form. The results obtained were almost the same as explained above.

The above cited results indicate that although fertilizer and cropped area continue to contribute to increase the output of food grain crops but HYVs did not contribute much towards the same. It may be noted that HYVs were the most important inputs to boost agriculture which did not turn out significant during the 1980's and 1990's. It again provides us an important information that to accelerate agricultural output, developement of HYVs is important. The increase in cropped area and more use of fertilizer could not help to reap the benefits until HYVs are utilized since they are complementary in nature. It is important that equal attention is paid to all these variables.

Table 2:

Long Run significant Variables
(1972-95)

Variable	Coefficient	
Constant	0.781	
	(1.24)	
Water/Irrigation	9.24*	R–2 = 0.97
	(1.70)	DW = 2.19
		F-Stat = 273.7
HYVs	0.026**	
	(1.1)	
Fertilizer	0.28*	
	(5.7)	

*   Significant at less than 10 percent.
**   Significant at 28 percent.
( )   T-Statistics, Tested in log form.

B.   SHORT RUN SIGNIFICANT VARIABLES@
(1985-95)

Variables	Co-efficient			
Constant	−0.96			
	(−1.09)			
Water/Irrigation	0.61*	$R^{\overline{2}}$	=	0.74
	(1.5)	DW	=	2.3
		F–Stat	=	10.94
Fertilizer	0.13**			
	(0.86)			

*   Significant at 17 percent.
**   Significant at 40 percent.
@   Tested in log form

Other relevant variables were also tested but found insignificant and therefore they were dropped.

A separate analysis for the period of 1984/85 to 1994/95 was carried out by using regression analysis. The results indicated that the significant variables also became insignificant during this period. Only fertilizer and irrigation were found significant. It indicates that the engine of agricultural growth has run short of steam, in the last decade (1984/85 - 1994/95). Another variable which could also help to improve the productivity is the use of pesticides. An overview of the performance of the same indicated that it is also not wide spread. Therefore, it is needed that the same may also be introduced to further accelerate the agricultural output.

PART - IV

CONCLUSION

The paper was focused to pinpoint the long run sources of growth for major commercial and food crops. The major factors analysed were hectereage effect, yield effect and cropping pattern effect. Besides, major variables of Green Revolution were also discussed. Our results indicated that, among the food crops, hectereage effect was significant for wheat, rice, and maize. However, HYVs and the use of insecticides were not very encouraging. The above analysis indicated that fertilizer and irrigation played a significant role in improving agricultural output. However, the results for the same for the period 1984/85 to 1994/95 indicated that these variables also became insignificant. Thus, there is a need to pay appropriate attention for sugarcane for the 1980's while the same was also significant for wheat, maize and sugarcane for the 1960's. During 1984/85, it was only encouraging for maize. The long run effect of the same was also respectable for major crops. These results were consistent and similar to that of cropping pattern effect. The hectereage effect and cropping pattern effect were significant for cotton for the 1960's and 1980's. However it slowed down thereafter. The results pertaining to overall production of food grains and sugarcane indicated that these effects were respectable for the 1960's and 1980's. However, they were not encouraging for the period of 1984/85 to 1994/95.

Yield is the core factor to raise agricultural output. Our estimated results showed that it was respectable for all crops during the 1980's.

However it was not very encouraging for rice during the 1970's and thereafter. The same effect continued during 1980's. Thus, it was the only variable which showed significant impact.

The yield effect was supported by the modern inputs of Green Revolution. The analysis of these variables indicated that only irrigation/cropping area and fertilizer led to increase in production. A lesson learned from this analysis is that there is also a need to improve HYVs and its complementary inputs like higher application of fertilizer. The application of pesticides also needs to be fully introduced among the farmers. Besides, expansion in the cropping area and changes in the cropping pattern will also lead to improved agricultural productivity.

NOTES

1.   The weighted average agricultural growth in Pakistan, during the 1960's was 36 percent. It decreased to 20.24 percent during the 1970's. The growth rate is falling since then, indicating slow down of agricultural growth. For details see M. Aslam Chaudhary (1989).

2.   A detailed analysis of the linkages of the spread of green revolution and agricultural growth is carried out in Section-III of this paper.

3.   Pakistan has a good potential to raise dairy and Livestock products. However this area is neglected in spite of its lion's share in agricultural output. For further information see Chaudhary and Chaudhary (1994), "Agricultural Development and Public Policies", Department of Economics, Quaid-i-Azam University, Islamabad.

4.   There are two types of factors which could enhance productivity i.e. more and more use of inputs which is extensive growth; while efficiency and technical change is referred to intensive growth. Only extensive growth is analyzed in detail here. For more information regarding intensive growth see reference (1) above.

5.   Several regression estimates were made for different samples. Only significant results are reported in Table 2.

Contribution to Output Growth of Crops

Crop	Year	Hectereage Effet	Yield Effect	Cropping Pattern Eff.
Wheat	1959-60 - 1969-70	58.5	38.0	3.6
	1970-71 - 1979-80	26.1	73.7	0.3
	1980-81 - 1989-90	54.6	49.1	(−)
	1984-85 - 1994-95	27.0	70.0	3.4
	1959-60 - 1994-95	39.0	58.0	3.3
Rice	1959-60 - 1969-70	19.2	39.0	42.0
	1970-71 - 1979-80	61.6	8.6	30.0
	1980-81 - 1989-90	50.0	(−)	(0)
	1984-85 - 1994-95	11.1	(−)	(−)
	1959-60 - 1994-95	52.0	26.1	22.8
Maize	1959-60 - 1969-70	80.4	1.8	12.4
	1970-71 - 1979-80	61.5	72.5	(−)
	1980-81 - 1989-90	59.5	40.5	(N)
	1984-85 - 1994-95	51.0	−88.0	(_−)
	1959-60 - 1994-95	57.1	30.4	12.5
All Food Grains				
	1959-60 - 1969-70	28.2	63.5	8.2
	1970-71 - 1979-80	3.2	96.2	0.6
	1980-81 - 1989-90	66.2	34.0	−
	1984-85 - 1994-95	5.0	11.7	−
	1959-60 - 1994-95	20.0	80.0	0.08

Calculated from: Economic Survey, M/O Finance, EAW, G.O.P. (1994-95)

(−)   Negative

N   Nagligible

Contribution to Output Growth of Commercial Crops

Crop.	Year	Percentage Contribution to output		
		Hectereage Effect	Yield Effect	Cropping Pattern Eff.
Cotton				
	1959-60 - 1969-70	45.0	7.0	38.5
	1970-71 - 1970-80	56.2	33.1	10.7
	1980-81 - 1989-90	23.5	65.9	10.6
	1984-85 - 1994-95	38.2	51.1	10.7
	1959-60 - 1994-95	37.7	49.6	12.7
Rice				
	1959-60 - 1969-70	19.2	39.0	41.8
	1970-71 - 1979-80	61.6	8.6	29.7
	1980-81 - 1989-90	50.0	(−)	(−)
	1984-85 - 1994-95	11.1	(−)	(−)
	1959-60 - 1994-95	52.0	26.1	22.0

Calculated from: Economic Survey (1994-95), M/O Finance EAW G.O.P.

(−)   Negative

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DETERMINANTS OF FIXED INVESTMENT IN THE AGRICULTURE SECTOR

By

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Introduction:

The recent literature on private fixed investment emphasized the role of shocks in investment decisions, that are associated with a number of factors arising due to government's fiscal and monetary policies, foreign policy and uncertainty. When variables associated with these factors vacillate the quality and quantity of investment does not go unaffected[1]. All such shocks render the decision making process regarding investment highly complex and multifarious. Pre-Keyesian theory provided a simple explanation of this complex behavior: *the level of investment spending is determined by the community's decision to save*[2]. Though the statement gave a superficial account of reasons to invest however, that does not comment on the cyclical performance of investment spending. Later, Keynesian theory attributed erratic flucuations in investment demand to capricious shifts in business expectatations arising due to change in different exogenous variables.

Recent studies addressed the issues in investment demand modeling with respect to following issues: (1) consistency of the theoretical model, (2) characteristics of the technology, (3) treatment of expectations, and (4) the impact on investment spending of prices, quantities and shocks3. Out of these issues, the role of autonomous shocks on investment, in other words study of erratic fluctuations in investment demand, has not received due attention in investment modeling. Although most of the studies for Pakistan have taken into account the first three

issues but hardly anyone considered the last, the impact of shocks on private fixed investment spending decisions, especially at sectoral level[4].

During 1970s and late 1980s the share, of agricultural sector in total private fixed investment has fluctuated erratically from 15.30 per cent in 1972-73 to 33.31 per cent in 1977-78. later, it started to decline and reached as low as 14.41 per cent in 1992-93. The agricultural sector investment rate has remained as low as 0.76 per cent in 1975-76 and could not go beyond 2.08 per cent in 1978-79 and 1.18 per cent in 1992-93. Such a performance of agricultural investment calls for a greater insight to the problem of low investment in this sector.

So far, Naqvi et al. (1983) and (1986) estimated investment function for the private investment in the agricultural sector and found that it was a function of value added in agriculture, relative prices, and remittances. In Naqvi et al. (1993) the choice of explanatory vairables for the agricultural sector was: value added in agriculture, remittances from abroad and the total public investment. Ashfaque Khan (1989) also studied the behavior of private fixed investment in the agricultural sector. He focused on responses of investment to output, changes in private sector credit, general market conditions, and public investment. Improving upon their work present study will focus on determining the impact of autonomous shocks caused by, output growth, public investment, export penetration, real devaluation and uncertainty, etc. One of the important feature of this research is that it employs latest developments in the estimation and analysis of investment demand functions. So far, these developments have been used only in the estimation of total fixed investment functions. Here the techniques will be applied to estimate the agricultural sector demand function.

The paper is divided into five Sections. Section II of this paper provides a theoretical framework to develop a model in the next section. Besides the model Section III also highlights important hypotheses to be investigated. Section IV presents the results of the study. Finally, the conclusions and policy implications are summarized in Section V.

Determinants of Private Fixed Investment

Many economists tried to develop empirical models to explain the fluctuations inherent to fixed investment spending. These empirical models are broadly based on simple accelerator theory, liquidity theory, expected

profits theory, Tobin's Q theory, and neoclassical theory of flexible accelerator for investment. The neoclassical flexible accelerator type models developed by Jorgenson and his followers received special attention by the applied econometricians. However, In case of developing countries the development of new theoretical models had not been accompanied by any significant improvement in their empirical performance. A major reason for this breach is that critical assumptions, i.e. perfect competition, constant returns to scale and laissez faire, etc., underlying standard theoretical models are not satisfied in the developing countries. Thus, the widening gap between theoretical models and empirical performance has given rise to the need for further examination of the dynamics of the investment process[5]. Researchers in developing countries have mainly focused on testing various hypotheses propounded to explain the volatility of investment spending in developing countries. These hypotheses revolved around the impact of: output growth, availability of credit to private sector, real devaluation and uncertainty on private fixed investment.

It is argued that sustained growth of the economy is not possible unless investment maintains a trend growth. It has been suggested that private fixed investment is directly proportional to the growth of real output, vice versa {Harrod R. (1939) and Domar, E. (1947)}. It is believed that countries with higher per capita income could save more to finance investments.

In developed countries real interest rates and polices affecting them can influence private investment, but there is no empirical finding supporting this relation for developing countries. This is because of repressed financial markets in these countries, where credit policy (and not interest rates) directly affects the investment level {Serven and Solimano (1991)}. Credit policy affects investment directly through the stock of credit available to private sector firms. A significant and positive relationship has been established between business fixed investment and the availability of credit to private sector by Blejer and Khan (1984), Fry (1980) and Khan (1984).

An overvalued exchange rate can also be a factor determining low levels of investment because, it reduces the returns in local currency received by exporters. Exchange rate management policy, as it is being prusued in Pakistan now a days, affects private investment through several channels. It is simultaneously an expenditure-reducing and

expenditure-switching policy. It may reduce private investment through its negative impact on domestic absorption. However, the expenditure-switching aspect may produce completely different results and induce investment in tradable activities {Aizenman (1992), Cardoso (1993) and Oshikoya (1994)}.

It is argued that macroeconomic stability (low rates of inflation, external and internal balance, etc). is of paramount improtance to ensure a strong response of private investment to economic incentives. In favor of the above argument Pindyck (1991) emphasized that uncertainty inherent to investment spending comes from its irreversible nature. Capital once installed is immobile as comapred to labor[6]. Therefore, the study of irreversible type of investment in an uncertain environment becomes necessary. Investment is considered to be negatively proportional to the perceived degree of uncertainty as the fixed investment decisions cannot be 'undone' if future events turn out to be unfavorable[7].

The following hypotheses are being tested in the study: i) public policies affect real private fixed investment, ii) autonomous shocks play an important role in private fixed investment decisions, iii) Uncertainty reduces the credibility of investment incentives.

The Model and empirical Results

Most of the studies for developing countries have utilized The Implicit Dynamics Benchmark Model (IDBM), specified in Chirinko (1993), to study aggregate investment function, such as:

$$K^*_t = f[\text{Prices, Quantities}] \qquad \qquad ..... (3.1)$$

Where K^*_t is the desired capital stock. The element of dynamism is introduced in the prototype model while specifying it for investment demand. The model can be excelled into a standard accelerator model and a modification may be introduced for the inclusion of shocks as follows[8]:

$$I_t = f(Y_t, dS_{it}) \qquad \qquad .... (3.2)$$

Where Y_t is the output in period 't' and S_{it} is some unidentified autonomous shock in period 't'. Agricultural investment functions are specified to incorporate the impact of autonomous shocks on the basis of (3.2). These specifications provide a framework to examine the impacts of

different shocks, generated by the tools of monetary, fiscal and commercial policies, aimed at the correction of unsustainable macroeconomic imbalances, on investment. Based on the theoretical reasoning in Section II an investment demand function in the agriculture sector is specified as follows:

$$I_{pag} = f\{(\Delta Y_{agt}/Y_{agt}), I_g, (\Delta CR_{agt}/CR_{agrt}), \sigma_{xgt}, WR_t, RELP_{ag},$$
$$RER_{t-1}, I_{pag(t-1)}\} \qquad \qquad \dots (3.3)$$

That is, investment in agriculture is a function of output growth in agricultural sector ($\Delta Y_{ag}/\Delta t$), public investment (I_g), growth rate of agricultural credit, ($\Delta CR_{ag}/CR_{agrt}$), coefficient of variation in-export to GDP ratio (σ_{xgt}), workers remittances (WR_t), relative price of capital in the agriculture sector ($RELP_{ag}$), and real exchange rate (RER_{t-1}) {for the construction of variables like (σ_{xg}) and RER etc., please refer to appendix at the end}. The specification is consistent with the theoretical developments described earlier and the neoclassical tradition. The model described here takes into account autonomous shocks relating to pblic investment, agricultural credit policy, exchange rate variability; price uncertainty and terms regarding economic instability, etc.[9]. These variables have been considered by a number of researchers, e.g., Serven (1990); Rama (1990); Serven and Solimano (1991); Larrain and Vergara (1993); and Oshikoya (1994). All such innovations in the investment function are found useful in explaining the aggregate investment behavior in the agricultural sector. The inclusion of real exchange rate and uncertainty terms in the aggregate investment function may, however, raise the aggregation problem. The problem can effectively be dealt by imposing restrictions specified by Rama (1990)[10].

More specifically the agricultural investment demand function will become:

$$LIP_{ag(t)} = \quad \beta_0 (\Delta Y_{agt}/Y_{agt}) + \beta_1 LI_{gt} + \beta_2(\Delta CR_{ag}/CR_{agrt}) - \beta_3 \sigma_{xgt}$$
$$- \beta_4 LRELP_{agt} - \beta_5 RER_{(t-1)} - \beta_6 LIP_{ag(t-1)} + \beta_8 U \quad \dots (3.4)$$

Equation (3.4) is log linear in nature and Symbol 'L' is a natural log operator. Specifications used by Khan, Ashfaque (1989) and Naqvi, et al. (1993) for the agriculture sector are estimated by introducing innovations regarding real exchange rates, variation in export to GDP ratio, and relative price of capital in agriculture. These variables are found

to be significant along with other conventional variables, i.e., growth rate of GNP in the agricultural sector, growth rates of stock of agricultural credit and investment in the government sector, etc. The introduction of new variables not only improved the adjusted R^2 but also the significance of all the other variables as well. The inclusion of new variables is tested for restrictions imposed by Rama (1990) for aggregation prblem, using Wald test thereby, validating new specifications. The equation for fixed investment in the agricultural sector is estimated by employing Cochrane-Orcutt process for auto correlation correction. The equation has passed the goodness of fit tests, i.e., LM test for serial correlation; ARCH test for heteroscedasticity; Ramsey RESET test for specification errors; and Chow forecast test.

The results confirmed that long-run impact is positive for growth of agricultural income and agricultural credit. The coefficient of public investment is positive which indicates a long-run complementarirty between the public and the private fixed investment. Public investment in infrastructure would promote private investment and enhance growth.

Real exchange rate, relative price of capital in agriculture, variations in export to GDP ratio, and real exchange rate for imports, serving as a measure for uncertainty arising due to structural adjustment and instability in macroeconomic performance, has negative impact on private fixed investment in the agriculture sector. The results are consistent with that of Oshikoya (1994). In addition, variations in several macroeconomic indicators, however, not reported here were tested as a proxy for uncertainty due to macroeconomic instability, i.e., variations in the; growth rate of GDP; commodity prices; real exchange rates; etc. The variation in export to GDP ratio was however, found to be highly significant, at 5% level. The export to GDP ratio is one of the key indicators for investment in agriculture because, Pakistan's economy is an agro-based one. Commodity exports comprising a large part of agricultural commodities make a sizable portion of our export such as rice and cotton.

The results suggest that the elasticity of growth rate of agricultural income to investment is 1.44 significiant at 5% level. A 1per cent change in the growth rate of output in the agriculture sector will bring about 1.44 per cent change in the fixed investment in this sector. The elasticity of public investment to $1P_{agt}$ is 0.76 and it is significant at 1% level while the elasticity of growth rate of agricultural credit is 0.22

significant at 1% level. Variation in export to GDP ratio has a coefficient of −0.0021, indicating that a 1per cent change in σ_{xy} will decrease private investment in agriculture by only 0.002 per cent. The relative investment prices' coefficient (−1.137), significant at 1% level, has a negative impact on private fixed investment in agriculture. The coefficient of real exchange rates (−0.001) is highly significant and has a negative impact on private fixed investment in agriculture. It is believed that expectations associated with exchange rate instability play an important role. One may anticipate capital flight in wake of devaluation and fewer resources would be available for investment. A lagged RER term provides sufficient support for negative impact of anticipated devaluation on private investment, the term implies static expectation hypothesis.

Results of Privat Investment function in the Agriculture Sector

Sample Size (1972-73 to 1992-93)

$$\text{LIP}_{ag(t)} = \quad 5.86 \quad + 1.44(\Delta Y_{agt}/Y_{agt}) \quad + \quad 0.76\text{LI}_{gt} + 0.22(\Delta CR_{agt}/CR_{agt})$$
$$\quad\quad (4.103) \quad (2.364)^* \quad\quad\quad\quad (9.462) \quad (2.10)$$

$$-0.0021\sigma_{xgt} -1.137\ \text{LRELP}_{agt} - 0.001\ \text{RER}_{(t-1)} -0.032\ \text{LIP}_{ag(t-1)}$$
$$(-3.294) \quad (-3.754) \quad\quad\quad (-6.98) \quad (-1.403)^{**}$$

R^2	0.98	D.W Statistics	1.9	SER	0.0943
Adjusted R^2	0.96	F-Statistics	77.14		

Figures reported in parentheses refer to t-statistics. All the coefficients are significant at 1% except: * Significant at 5%

Conclusions and Policy Implications

The conclusions are drawn by empirically investigating the model developed in Section III. The results reported are supporting the hypothesis that:

1. Public policies in fiscal and monetary sectors of the economy have a considerable positive impact on real investment.

2. Autonomous shocks, i.e., output growth shocks, relative price shocks, export instability and real exchange rates, etc., affect private fixed investment decisions, badly.

3.   Finally, it may be asserted that price uncertainty and instability
         arising due to macro-economic reforms, reduce the credibility of
         investment incentives and have a significant negative effect on
         investment spending in the private sector.

The response of private fixed investment to output attests the
neoclassical accelerator notion of investment. There is evidence of positive
impact of public investment toward private fixed investment in this sector.
The results are consistent with that of Khan (1989) for Pakistan who had
shown complementarity of public investment toward private investment in
all the sectors. In the long-run complementarity of public investment to
private agricultural investment comes from investment in the farm to
market roads, productive village infrastructures, land leveling, land
reclamation, construction of canals, mini dams and water channels, etc.

The impact of credit availablity suggests that in the past private
fixed investment has adjusted to credit availability mechanisms. Smaller
significance of the credit availability variable may follow from the
government policy of treating private sector credit demand as a residual
till 1992-93.

The results coming out of uncertainty factors suggest that the policies
resulting into erratic and a inflationary bias in the economy may
compound macro-economic instability. Macro-economic policies of
exchange rate adjustment and government support prices etc., may affect
private fixed investment drastically. In this study real exchange rates bear
negative sign, the coefficient is, however, smaller in magnitude. A sharp
increase in exchange rates, real devaluation of the rupee, affects the input
market for example, the prices of fertilizers have increased markedly in
past (though provided on subsidies), the prices of agricultural tractors,
their imported spare parts and pesticides have increased after the
liberalization of exchange rates. The price of exportables have also gone
up. A country where inflation is on rise firms cannot benefit from price
changes resulting through real devaluation of currency.

Many developing countries suffer from high and unpredictable
inflation, which is usually matched by high relative price variability.
Under such conditions a relative price change will reduce the effectiveness
of policy induced sectoral incentives and substantial time may elapse
before investors become convinced that the change is permanent. The
Government's pricing policies during the Seventies also hampered the

growth of the agriculture sector. The negative impact of inflationary pressures on private fixed investment is also confirmed by the coefficients of relative price terms in investment demand functions estimated here. The results suggest that macro-economic policies should be pursued with great austerity. The results of real exchange rate, export instability and uncertainty suggest that these shocks may retard private fixed investment in the agricultural sector. Malik et al. (1994) analyzed that fluctuations during the 1960s and 1970s illustrated our agriculture dependence specially in exports. It has been demonstrated that Pakistan's export performance has been vulnerable to the vagaries of nature that effect agriculture. During the next decade (1980s) the share of primary commodities continued to fall up to 15.9 per cent in 1992-93. The decline in the share of primary commodities in early 1980s was due to slump in the world demand for cotton and fall in the prices of raw materials in the ensuing years[11]. The results are consistent with those of Chhibber and Dailami (1990), Serven and Solimano (1991), Cardoso (1993), George and Morisset (1993) Larrain and Vergara (1993) and Oshikova (1994).

This area of investment, i.e. the role of shocks has been least explored. The results reported in this research suggest the need for understanding the role of shocks in investment in developing countries. The model employed based on single equation can not fully explain the behavior of different shocks. It is therefore, needed that a bigger model that clearly incorporates all the behavioral relationships between different variables must be constructed. Present research has overlooked the supply of investment finance through different sources and concentrated only on the supply of credit by the Banking sector. A more desegregated model is required that may take into account micro-economic foundations of investment finance. The data limitations remained in this study. The research employed data that was aggregate in nature. Future research on the topic should employ disaggregative data.

End Notes:-

1.   Historically, Investment has been the least stable component of aggregate demand {Hall & Taylor (1991)}.

2.   See, Junankar (1972), p. 12.

3.   See Chirinko (1993) for a detailed discussion on these issues.

4.   Khan (1989) has also criticized earlier studies on Pakistan that they have estimated investment functions with no sound theoretical foundations, e.g. Naqvi et al. (1982) Naqvi et al. (1984) and Naqvi & Ahmad (1986). Present study will take into account all the latest developments in the analysis of investment demand.

5.   A long list of models can be found in surveys by Greenberg (1976), Fisher (1983), Rama (1990) and Chirinko (1993). They have provided a historic account of development in the models used for the analysis of private fixed investment behavior along with innovation in methodologies.

6.   Capital equipemnt become industry specific and can hardly be put to another use or productive process or activity without incurring a substantial cost.

7.   Rodrick (1990) argued that 'a macroeconomic adjustment program may increase uncertainty in the short run, as private investors start receiving mixed signals some associated with the previous policy rules, some with the stabilization package, and some with the structural reform aimed at restoring medium term growth.

8.   For a detailed mathematical exposition one may refer to Khan (1989).

9.   George and Morisset (1993) had studied the impact of volatility of price of capital and output as a measure of instability and uncertainty to study the irreversibility of private investment for Chile. For this purpose they introduced the ratio of price of capital to GDP deflator as a variable determining instability. Serven and Solimano (1991) brought evidence from twenty-nine (29) countries of Latin America, Africa and Asia including Pakistan that private investment is affected by foreign debt, real exchange rate variability, and output growth variability. The variability associated with these variables suggests uncertainty due to structural adjustment programs in these countries. Cardoso (1993) studied the impact of variability of price of capital on private fixed investment alongwith other shocks, i.e., public investment, terms of trade, real exchange rate, growth of GDP,

and volatility of real exchange rates on private investment. Later, Oshikoya (1994) studied the impact of real GDP growth, terms of trade (TOT), real exchange rates (RER), private secotr credit demand, public investment, price instability, and debt servicing on private fixed capital formation. Oshikoya had also suggested, though he himself used aggregate data, that further studies on investment should utilize disaggregated data.

10.   Rama (1990) states that It is intuitively clear that not all the firms in the economy may suffer from all these shocks. Some firms may face foreign exchange shortages, some other suffer from credit controls, while some firms may abide by economic instability. However, all these firms can be combined together to get a macroeconomic investment function. On the basis of his argument it could be assumed that a fraction (μ) of the firms are fastened by infrastructure or degree of monopolistic competition in certain sectors of the economy, represented by `j'. While the investment rate of a fraction ($\Omega$) of firms is bounded by financial repression, relative prices of capital, etc., and may be represented b `z'. Finally, foreign exchange, terms of trade problems or exchange rate controls, etc., may prove binding constraints for other firms say `w'. Hence, the macroeconomic investment equation resulting from the above stated argument would be: $\{I_t = \mu^* i_{jt} + \Omega^* i_{zt} + (1 -\mu-\Omega)^* i_{wt}\}$, this expression may be tested by setting μ and Ω equal to either 0 or 1.

11.   See Naqvi and Sarmad (1984).

APPENDIX

Contruction of Important Variables

The methodology regarding the construction of some of the important variables such as NER and (σ^2_{xg}/XGDP) needs to be highlighted. The series on NER is calculated using IMF's Multi-Exchange Rate Mechanism (MERM) given in International Financial Statistics (IFS) of the International Monetary Fund (IMF).

Nominal Exchange Rate

The nominal exchange rate index series is defined as the nominal exchange rate of the j-th reporting country deflated by a weighted geometric average of the nominal exchange rates of its 'n' partner countries:

$$NER_j = (ERI_j) / EXP \sum_{i-1}^{n} (WT_{ji} \times Ln (ERI_i)) \times 100$$

Where   ERI   =   The exchange rate index with a fixed base (1980/81 in our case)
        j   =   index for reporting country
        n   =   number of partner countries to j
        i   =   index of partner countries to j
        Wtji =   weight that country j attaches to country I

The weights taken for each country are based on the average trade flows (import + exports between Pakistan and the selected countreis) in 1980/81. The ERI for Pakistan is divided by a geometric average of the weighted exchange rate index of its 15 major trading partners.

Real Exchange Rate

The real exchange rate index series is calculated by adjusting ERI for relative price changes in its trading partners. For the purpose we have used a product of ERI and CPI. The CPI is the consumer price index in the ith country. The relative exchange rate in index for Pakistan is divided by a geometric average of the weighted relative exchange rate index of its 15 major trading partners.

$$RER_j = (CPI_j \times ERI_j) / EXP \sum_{i-1}^{n} (WT_{ji} \times Ln(CPI_i \times ERI_i)) \times 100$$

Variation in Export to GDP Ratio

The series on coefficient of variation of Export to GDP ratio (X/GDP) is calculated by dividing three years moving standard error of X/GDP by a three-year moving average of X/GDP.

$$\sigma_{xg} = (\sigma^2_{xg}/XGDP)*$$

* Three year moving average

Larrain and Vergara(1993) used (t) and (t-2) for calculating variation coefficient. Cardoso (1991); and George and Morisset (1993) tried (t), (t-1), and (t-2) for the same. Present study used (t), (t-1), and (t-2) for calculating coefficient of variations for different variables.

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ASSESSING THE IMPACT OF THE ENTREPRENEUR'S PERSONALITY ON THE GROWTH PERFORMANCE OF FIRM

By

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Escalating employment problems have led to an increased interest in the promotion of the small scale manufacturing sector. Ideally this sector can best be promoted through the creation of a favourable policy environment. Such an approach is, however, difficult to generate, and is hardly to be found anywhere. In the words of an ILO Study that assesses such policies in developing countries.

> "While it was often found that pronouncements about assisting the small enterprise sector could be found in government and non-government utterance, many such statements were not fully supported by Government policies... A summary of the policy issues affecting small business suggests that if they are not altogether absent, they are either irrelevant, ill-suited to the needs of the sector, or have a negative, rather than a neutral, impact.

> "...practical policies are not forthcoming since their formulation is the end-result of trade-offs between power groups and not necessarily the end-result of well designed research programmes." (ILO, 1982: p. 15)

The alternative is the Project Assistance Approach, which, being easier to implement, is the prevalent strategy. It aims at providing assistance (financial, managerial, technical, infrastructural etc.) to a few selected beneficiaries. The success of such an approach depends crucially on the performances of those selected.

There is ample evidence to suggest that assistance programmes have had only limited success. In India, for example, Sandesara (1991) finds that for the most part firms located outside industrial estates performed better than those located within (Sandesara, 1980, 1991). Elsewhere he reports that firms receiving long term finance from state corporations had lower growth rates, lower profitability; lower capital productivity and a higher capital intensity than the unassisted firms (Sandesara, 1982). In the Phillipines, Anderson and Khambata (1981)

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point out the tendency among small firms to overinvest when financed by financial institutions:

> "Two thirds of those financed had over estimated their initial sales levels by more than 100%. and in consequence were saddled with excess capacity, high overheads and dangers of bankruptcy; in fact, many did go bankrupt" (Anderson, 1982: 931)

In Pakistan, Rehman, H. (1985) reports that plots allotted to potential entrepreneurs in small industrial estates have remained vacant for more than five years -- a long term disuse of resources. Khan et. al, (1993) reveal that the selection of candidates in two programmes for the provision of finance to small scale firms (1) has been less than satisfactory:

> "there was a gap between the number of persons receiving PSIC(2) loan to start industrial ventures and those who actually did so, and still more; betwcen those who started the enterprise and those who stayed in production.

> "The cases of those who received the financial support but did nothing clearly indicate that some of the PSIC loans did not serve the purpose they were supposed to. Another serious policy concern are those enterprises which faced closure after a brief stint in production. It is a clear case of social waste of resources which needs to be looked into and it is extremely important also to Identify their capital, production, marketing and management constraints vis a vis those which are operating successfully. This should lend useful insight to the PSIC in the screening of applications from potential investors in future" (Khan, et. al., 1993: p. 48).

When consigning progrmmes for promoting small industry it is important to recognise that not all firms in an industry are capable of growth. As Sandesara puts it:

> "Only a tiny minority of the many companies in the small scale sector will grow into large firms. Some of the rest will become a little larger while others, perhaps the majority will stay the same size. Some will die. It is difficult to predict which units will grow and even more difficult to design and operate a programme sensitive enough to benefit them. This is both a challenge and an opportunity to make aid agencies more productive.... a more discriminating programme of assistance needs to be designed and operated... favouring growth oriented and viable units... A policy

of indiscriminate assistance, while appearing vaguely "fair" and "just", is wasteful in that it gives excessive assistance to some units and thus deprives of aid to other units which may be at least as deserving or as important...." (Sandesara, 1991 : 146-7).

In the small environment, the owner plays a crucial part in the performance of the business. Therefore, when screening candidates for assistance programmes, due consideration should be given to the owner's personality, his/her socio-cultural and economic background, which factors determine the owner's motivation, goals, abilities and access to resources.

Based on a survey of 75 small firms in the furniture and leather footwear industries, this paper investigates the impact of the personality of entrepreneurs on the growth performance of their business. It provides a method of measuring the enterpreneurial personality, and attempts to determine which of the characteristics has greatest impact on growth performance. Following the introduction, it is divided into five sections. Section 2 discusses the personal characteristics that are thought to be conducive to business success. Section 3 describes the methodoloy used to ascertain the presence or absence of these characteristics among the sample entrepreneurs. Section 4 relates the entrepreneurial personalities to business performances. Section 5 provides the conclusions regarding the importance of personal characteristics in business success, and discusses policy implications stemming from the study.

2. Characteristics of the Successful Entrepreneur

Ever since Schumpeter (1911) highlighted the importance of the 'entrepreneur' in economic development, scholars, researchers, and organizations have been attempting to define and identify this 'heffalump' (3). Schumpeter had defined the 'entrepreneur' as someone who brought about a change in the economy (through the identification of a new product, raw material or technological process, for example). The entrepreneur was therefore distinct from the manufacturer who indulged in the production of existing products, using existing raw materials and technology. The term entrepreneur has recently been used more broadly to include small business owners, on the grounds that they face the same uncertainties, and have to be as enterprising as the Schumpeterian entrepreneur to cope with them. Over the years, research has focussed on identifying the characteristics that lead to entrepreneurial behaviour. Different methodologies have been used to identify such characteristics. There has been "arm chair theorizing" about the kinds of situations that an

entrepreneur faces and the traits that would be most useful to him (e.g. Kilby, 1971: Casson, 1982). Entrepreneurs themselves have been asked what traits have benefitted them most, and even sophisticated personality testing instruments have been administered to groups of people to identify such traits. The number of characteristics thus identified is so large and the characteristics at times so paradoxical, that a survey of such studies conducted by Gartner (1988) led him to state:

> "[A] startling number of traits and characteristics have been attributed to the entrepreneur, and a 'psychological profile' of the entrepreneur assembled from these studies would portray someone larger than life, full of contradictions and conversely, someone so full of traits that (s) he would have to be a sort of generic Everyman" (Gartner 1988: 21).

Reviewing the vast number of characteristics mentioned in these lists, McClelland (1987) found that the most commonly quoted are confidence, perseverance, energy, diligence, resourcefulness, creativity, foresight, initiative, versatility (i.e. knowledge of product and market), intelligence, and perceptiveness.

From the point of view of assistance programmes, it is more relevant to attempt to identify the characteristics of successful entrepreneurs, rather than the characteristics of entrepreneurs per se. McBer and Co. (1986) have specifically addressed this issue. They compared successful and average small business entrepreneurs in three different fields (Manufacturing, Service, and trade or marketing), and in three different countries (India, Malawi, and Ecuador). They found nine competencies (characteristics) that differentiated the successful from the average enterpreneurs (4) regardless of country or type of activity. These competencies grouped into three broad categories (proactivity, achievement, orientation, and commitment to others) are presented in Table 1. Because these characteristics are common to successful small scale entrepreneurs in three culturally different developing countries, they can safely be assumed to be independent of cultural environment, and therefore can be justifiably adopted into the present study as the model psychological profile of the successful entrepreneur in Pakistan as well.

Table 1 Characteristics Of Successful Enterpreneurs In India, Malawi, and Ecuador

A. Proacitivity	
1. Initiative:	Does things before being asked,' or forced to by events.
2. Assertiveness:	Confronts problems with others directly. Tells others what they have to do.
B. Achievement Orientation	
3. Sees and acts on opportunities	Seizes unusual opportunities to start a new business, obtain financing, land, work space, or assistance.
4. Efficiency Orientation:	Looks for or finds ways to do things faster or at less costs.
5. Concern for high quality of work:	States a desire to produce or sell a top or better quality product or service.
6. Systematic Planning:	Breaks a large task down into subtasks, or sub goals, anticipates obstacles, evaluates alternatives.
7. Monitoring:	Develops or uses procedures to ensure that work is completed or that work meets standards of quality.
C. Commitment to others	
8. Commitment to work contract:	Makes a personal sacrifice or expends extraordinary effort to complete a job, pitches in with workers, or works in their place to get work done.
9. Recognizing the importance of business relationships:	Acts to build rapport or friendly relationships with customers, sees interpersonal relationships as a fundamental business resource, places long term good will over short term gain.
Source:	McClelland, 1986, Table 1.p. 225.

3: Methodology

As already mentioned in the introduction, this paper is based on the findings of a survey of 75 small (5) furniture and footwear firms in Lahore. This survey was conducted in 1993 as part of a doctoral research.

Data relevant for the present paper relates to the measures for business performance, and personality of the entrepreneur. These are discussed in the following paragraphs.

The performance of the firm is measured as the change in employment over a five year period, ending 1993. The reason why employment, and not such variables as change in profits or sales, or other financial variables is adopted as a measure of business performance is that employment promotion is a major if not the main reason for the promotion of small scale industry. Also, given that small scale firms do not maintain accounts, accuracy of data relies on the memory of the entrepreneur. It is easier to remember employment levels five years ago, than it is to remember sales, revenues and cost levels. Employment levels are also less likely to be misreported than financial figures, given the tendency for secrecy among small scale businesses in the informal sector.

A measure of the personality of the entrepreneur is based on the nine characteristics mentioned in Table 1. The identification of these characteristics among entrepreneurs is done via the Behaviour Event Interview method devised by McBer and Co. (1986). This method is an adaption of the Picture Story Telling technique devised by McClelland et. al., (1953) to test the strength of the achievement motive (need achievement). Unlike the picture story telling technique where respondents are asked to write stories in response to pictures shown to them in a laboratory environment, the entrepreneurs in the present survey were asked to talk about five events that they thought were crucial to their business (a realistic environment, and a relevant subject compared to the artificial environment and artifical subject of the earlier technique). They were asked to relate their perceptions, thoughts, and actions, and what the outcomes of these events were. Then, just like in the measurement of the need achievement motive (the N-Ach Score), where the picture stories are scored for the presence of certain characteristics, the stories related by the entrepreneurs were scored for the presence of the nine characteristics mentioned in Table 1. for example, when an entrepreneur said that he anticipated a shortage of a certain raw material, and therefore stocked it, this was taken to mean that he had shown 'initiative'. When an entrepreneur reported that he made every effort to meet a certain order on time, he was taken to exhibit a 'commitment to work contract'. Each characteristic was awarded a score of 1. Therefore, if an antrepreneur had exhibited all nine characteristics that are attributed to a successful entrepreneurship, he was awarded a score of 9. And an entrepreneur showing none of the characteristics was given a score of zero.

4:   Personality and Business Performance: The Evidence

4(a):   The Distributional Profile of the Personality Scores:

Table 2 Distribution of Personality Scores of The Entrepreneurs

Score	Furniture	Footwear	Overall
1-3	10 (22)	7 (23)	17 (22)
4-6	25 (56)	13 (44)	38 (51)
7-9	10 (22)	10 (33)	20 (27)
Total	45 (100)	30 (100)	75 (100)

Note: Percentages in Brackets.

Table 2 shows that a very high proportion (78%) of the entrepreneurs had personality scores of 4 and above, with the majority of them (51%) scoring 4 to 6. This relatively high level of entrepreneurial ability is not surprising because only significant entrepreneurial ability can ensure survival in the small scale environment for five years or more.

Industry wise breakdown suggests that the distributions are different for the two industries. In the furniture industry a greater proportion of entrepreneurs are in the middle range. In the footwear industry the distribution is skewed towards the upper end. The greater proportion of better entrepreneurs in the footwear industry reflects the changing occupational patterns in the economy. The furniture industry sample was dominated by artisanal castes, whose traditional occupation was self employment. A large proportion of entrepreneurs had entered manufacturing because it was the traditional occupation, rather than a deliberate choice. The footwear industry sample on the other hand comprised predominantly of land owning and status castes, whose traditional occupation patterns were undergoing change. It is conceivable therefore that only those of them who possessed the necessary personality characteristics dared to venture into the new occupation. In more than one interview, for example, the entrepreneurs in the footwear industry emphasised that they came into the industry against family advice and because they were confident of their own abilities.

4 (b): The Relationship between Personality Scores and Growth Performance

The main hypothesis in this paper is that the better the personality of the entrepreneur, the better the growth performance of the firm. Does this hypothesis hold, with the measures of personality and growth

performace adopted in this study? Have people with higher personality scores also shown higher employment growth over the five year period? If this is so then there is every justification for advocating the screening of candidates for assistance on the basis of personality scores. For this purpose, firms were ranked into three categories of growth performance: those that had stagnated or had reduced employment by up to 10 workers over the five year period. Table 3 shows a clear, strong and statistically significant relationship between growth performance and personality of the entrepreneur. Entrepreneurs with poor personality scores have shown relatively poor growth performance. Those with high pesonality scores have shown high growth performance.

Table 3. The Relationship Between Growth Performance And Personality Scores

| | Personality Score | | | |
Employment Growth	1-3	4-6	7-9	Sum
Zero Or Less	10	6	0	16
1 - 10	7	27	7	41
More Than 10	0	5	13	18
Total	17	38	20	75
Chi Square = 39.81*** Crammer's V = .51***				

Table 4 Growth Performance and Personality Scores In Furniture Industry

| | Personality Score | | | |
Employment Growth	1-3	4-6	7-9	Sum
Zero Or Less	9	5	0	14
1 - 10	1	20	6	27
More Than 10	0	0	4	4
Total	10	25	10	45
Chi Square = 35.08*** Crammer's V = .62***				

This pattern is repeated even when each industry is considered separately. In the furniture industry, for example, of the 14 firms which exhibited no growth, 9 entrepreneurs had personality scores between 1 and 3, and all four of the firms that grew by more than 10 employees had personality scores in the 6-9 range (see Table 4). In the footwear industry

out of the 14 firms that exhibited high growth, 9 entrepreneurs had personality scores in the 6-9 range (see Table 5).

The better growth performance and the higher personality scores in the footwear firms (relative to growth performance and personality scores in the furniture firms) suggests that the different economic conditions may not be the only explanation of the differential in performance in the two industries. These economic considerations may themselves have attracted the more entrepreneurial personalities into the more lucrative field. The better performance of the footwear firms may thus be the result both of better economic conditions and better entrepreneurs.

Table 5 Growth Performance And Personality Scores in Footwear Industry

	Personality Score			
Employment Growth	1-3	4-6	7-9	S
Zero Or Less	1	1	0	2
1 - 10	6	7	1	14
More Than 10	0	5	9	14
Total	7	13	10	30
Chi Square = 14.09*** Crammer's V = .48***				

Personal Characteristics of Entrepreneurs

Table 6 Comparison of Average Personality Scores By Firm Size at Start of Period (1988) And End Of Period (1993)

	Personality Score		E	
1988 size	Furniture		Footwear	
	average	variance	average	variance
0-5	4.94	2.05	2.60	1.84
6-9	4.33	5.56	5.71	4.78
10+	5.17	5.47	6.00	2.44
1993 size	average	variance	1993 size	average	variance
0-5	3.73	3.93	0-15	3.40	2.84
6-9	4.31	2.06	16-30	5.38	1.73
10+	6.12	3.28	31+	7.00	1.67

4(c): Personality Scores and the Size of Firms

Is there a relationship between size of firm and personality of entrepreneur? Do people understand their personalities, and recognize their potential, so that those with entrepreneurial personalities start at a

higher level? This relationship was analyzed by comparing average personality scores of entrepreneurs of different sized firms both in 1988 and in 1993.

Table 6 shows the mean and variance of the personality scores for entrepreneurs in the furniture and footwear firms of three size groups. There is a clear tendency for the average personality score to rise with firm size. However, this relationship is stronger in the footwear industry than the furniture industry because there is lesser dispersion round the mean in the former. The traditional occupational background provides an explanation for this phenomenon. The entrepreneurs in the furniture industry chose their profession in line with the traditional vocational patterns. Size of firm was dictated by historical patterns more than by personal considerations. Those from the footwear industry came from different traditional professions, had no historical patterns to follow in this line of work, and therefore their own personality considerations played a greater role in determining the size of start up.

In 1993, the relationship between size of firm and personality score becomes stronger for both industries. This change in pattern reflects the fact that while in 1988, there were many new firms of different sizes established by entrepreneurs of varying entrepreneurial ability, by 1993, all firms had been in existence for at least five years. The better entrepreneurs probably expanded their firms during this period, while those with poor personalities may have shrunk in size. Thus the change in the distributions over the two periods is an indication of the role of the personality of the entrepreneur in the growth performance of the firms.

In the footwear industry by 1993 firms had grown by significant levels. None of the firms were in the 0-5 size category. So a new size range was devised to compute the average personality scores. As can be seen the higher firms sizes are reflected also by the higher personality scores, and the dispersion round the mean is also very low compared to the earlier distributions (see Table 6).

4(d): The Distribution of Different Characteristics in Entrepreneurs

The last two sections have clearly established the connection between the personality of an individual and his/her performance in the business place. In this section, an attempt is made to identify the particular characteristics that differentiate the high fliers from the average entrepreneurs.

Table 7 provides a frequency distribution of the characteristics identified among the entrepreneurs in the sample. All the characteristics were found in a significantly high proportion among the entrepreneurs surveyed (even the least occurring characteristic was identified in 45% of the sample). As already mentioned, the high frequencies are explained by the fact that the entrepreneurs in the sample had been in operation for five years or more in the extremely competitive and uncertain environment of the small scale sector, where mere survival (let alone expansion and growth) requires significant entrepreneurial potential.

The most frequently encountered characteristic was the commitment to work contract' (no. 8), identified in 71% of the sample.

Table 7 Frequency Distribution of the Nine Characteristics (Percentages)

	Characteristics	Furn N=45	Foot N=30	Sum N=57
	A. Proactivity			
1.	Initiative	62	73	67
2.	Assertiveness	56	47	52
	B. Achievement Orientation			
3.	Sees and acts on opportunities	40	53	45
4.	Efficiency Orientation	40	67	51
5.	Concern for high quality of work	47	50	48
6.	Systematic Planning	56	71	61
7.	Monitoring	58	47	53
	C. Commitment To Others			
8.	Commitment to work contract	67	77	71
9.	Recognizing the importance of business relationships	56	53	55

This is consistent with the extremely competitive conditions in the two industries surveyed. Entrepreneurs generally recognized that if they were not able to deliver in terms of timing or quality, they would face difficulty in procuring further orders for production. Their very survival therefore depended on their commitment to the work contract.

The least frequently found characteristic was the potential to 'see and act on opportunities'. Even this was found in a relatively high proportion of the entrepreneurs (45%). This characteristic is conceivably one of those that distinguish the high fliers from the mere survivors.

An industry wise breakdown of the sample suggests a similar pattern to that in the previous section. While the overall distribution patterns between the two industries are similar, the frequency of occurance of these characteristics is higher in the footwear industry than in the furniture industry, resulting in the somewhat greater proportion of high personality scores in the former (already noted).

4(e) : The Relative Importance of Different Characteristics in Growth Performance

Table 8 shows the proportion of entrepreneurs in the three performance categories displaying each of the characteristics. It demonstrates that as the performance level increases, so does the proportion of entrepreneurs displaying each of the characteristics. Thus while the taking of `initiative' was identified in only 6 of the 16 (38%) enterpreneurs whose firms either stagnated or declined in employment size, all 18 entrepreneurs (100%) whose firms recorded growth of more than 10 employees displayed this characteristic. The least common characteristic among the low growing firms was the ability to `see and act on unusual opportunities'. The most common was the `commitment to work contract'. These two were also the least and highest found characteristics among the medium growth firms. However among the fastest growing firms the least common characteristic was the concern for high quality of work', and the most common was the taking of `initiative'.

Table 8 Percentage of Entrepreneurs Showing Different Characteristics By Growth Performance

	Characteristics	Employment Growth			Sum N=75
		<=0 N=16	1-10 N=41	11+ N=18	
	A. Proactivity				
1.	Initiative	38	63	100	67
2.	Assertiveness	25	56	67	52
3.	B. Achievement orientation				
	Sees and acts on Opportunities	19	37	89	45
4.	Efficiency Orientation	31	46	78	51
5.	Concern for high quality of work	31	49	61	48
6.	Systematic Planning	38	63	78	61
7.	Monitoring	31	54	72	53

	·C. Commitment To Others			
8.	Commitment to work contract	50	73	83	71
9.	Recognizing the importance relationships	25	56	78	55

The characteristics really distinguishing the good from the average and poor entrepreneurs would be those with the greatest differential between the different categories of entrepreneurs. These are the ability to take 'initiative' (found in 100% of the most successful entrepreneurs compared to only 38% of the poor entrepreneurs), the ability to 'see and act on opportunities' (found in 89% compared to only 19%), 'efficiency orientation' (79 compared to 31%), 'systematic planning' (79 compared to 238%), 'monitoring' (72 compared to 31%), and 'recognizing the importance of business relationships' (78 compared to 25%). The differences between the characteristics of 'assertiveness', the 'concern for quality', and the commitment to work contract' although present are not as pronounced. Most pronounced differences are in the category of achievement orientation.

Industry wise break down of the sample revealed more or less the same patterns for both industries, and are therefore not reported here.

The relationship between characteristics and growth performance is analyzed further in terms of the three groups of characteristics (proactivity, achievement orientation, and commitment to others) to establish whether any one group is more relevant to growth performance.

Table 9 Distribution of Proactivity Scores by Growth Performance

	Proactivity Score			Total
	0	1	2	firms
0 or less	8	6	2	16
1 - 10	4	25	12	41
11 or more	0	6	12	18
chi square = 25.88*** Crammer's V = 0.42***				

4 (f) : Growth Performance and Proactivity

Proactivity refers to two characteristics: the 'taking of initiative', and 'assertiveness'. A score of 1 is given for each characteristic present. The score range on proactivity is from 0 to 2, with zero representing an individual who possesses none of these characteristics, while a score of 2 indicates the possession of both.

Table 9 shows the distribution of proactivity scores in relation to growth performance. Eight of the 16 low growth firms scored a zero on proactivity, and only two scored a 2. By comparison, twelve of the 18 high growth firms scored 2 and none of them scored zero. The majority of the middle growth firms scored a 1 on the proactivity score (25 out of 41), or a 2 (12 out of 41). And the Chi Square statistic clearly indicates that the relationship between proactivity scores and growth performance is statistically significant.

4 (g) : Growth Performance and Achievement Orientation

Achievement orientation has been found to be a relatively less prevalent aspect of the personality of entrepreneurs. This conforms with the findings of some studies that the greatest drawback in the growth prospects of a firm is the poor management, leading to poor profits and the consequent inability to expand (see Kilby, 1988). In this study the achievement orientation of an entrepreneur is measured on the basis of five characteristics: the `ability to see and act on opportunities', ` efficiency orientation', `concern for high quality of work', `systematic planning ', and `monitioring'. The achievement orientation score can therefore vary from 0 to 5. The results of cross tabulating these scores against growth performance are given in Table 10. There is again a positive relationship between achievement orientation scores and growth performance of firms, with low growth firms concentrating in the lower score range. The value of the Chi Square is very high, suggesting that the relationship is statistically very significant.

In terms of the individual components of the achievement orientation score, as has already been pointed out, the greatest differential between low and high growth firms was in the characteristics like the `ability to see and act on opportunities' and `efficiency orientation', followed by `systematic planning', `monitoring', and `concern for high quality of work' (see Table 8). The crucial variables differentiating the high fliers from the low and average enterpreneurs were therefore opportunism and `efficiency orientation'.

Table 10 Distribution of Achievement Orientation Score By Growth Performance

| | Achievement Orientation Score | | | | | | Total |
	0	1	2	3	4	5	Firms
0 or less	5	5	1	3	2	0	16
1 - 10	1	5	16	11	8	0`.	41
11 or more	0	0	2	5	6	5	18
chi square = 44.98*** crammer's V = 0.55***							

Table 11 Distribution of Commitment To Others Scores By Growth Performance

	Commitment to others Score			Total firms
	0	1	2	
0 or less	5	10	1	16
1 - 10	3	23	15	41
11 or more	1	·5	12	18

chi square = 17.06*** Crammer's V = 0.34***

4 (h): Growth Performance and the Commitment to Others

The commitment to others is the third aspect of the personality of the successful entrepreneur. This is reflected by two characteristics, the `commitment to work contract', and the recognition of the importance of developing business relationships with customers, suppliers and others who come in contact with the business. Again, the score for this can vary from 0 to 2, and as Table 11 shows, that there is a positive relationship between this and the growth performance of firms.

However, this relationship is not a as strong as that for earlier two aspects. The Chi Square value indicating the statistical significance of the relationship in this case has a smaller value compared to those obtained earlier. It is still high enough to indicate a 99% confidence level in rejecting the null hypothesis of no(relationship between these variables.

In order to establish the relative strength of the relationships of these three aspects and the growth performance of firms, the Cramer's V was used. The highest value was obtained for the relationship between achievement orientation and growth performance.

This was followed by the relationship between proactivity and growth performance, and the weakest relationship was between the commitment to others score and growth performance (see Table 9, Table 10 and Table 11). This suggests that while proactivity and commitment to others do differentiate between successful and less successful entrepreneurs, the greatest differentiating feature is the achievement orientation aspect of personality.

5: Conclusions And Suggestions

The main finding of this paper is that personality of the entrepreneur has a very significant bearing on the growth performance of the firm.

Other than the generally _ accepted characteristics of entrepreneurship like self confidence, persistence, diligence, risk taking ability, that are essential for entering into and surviving in the field of small business, the nine characteristics grouped into three aspects of personality: proactivity, achievement orientation and commitment to others have been shown to be significant in the growth performance of the firms.

From among the three aspects, proactivity is the most common, followed by the commitment to others and finally by achievement orientation. Thus it has been shown that while for low growth firms proactivity is the most pronounced aspect of the entrepreneurial personality, as growth performance improves, commitment to others increases faster than efficiency orientation. The best growth performance is seen from entrepreneurs who display achievement orientation as well. Within the broad aspect of achievement orientation, the two characteristics that display greatest variation among entrepreneurs are opportunism and efficiency orientation.

The study therefore suggests that when seeking to divert resources to small-scale entrepreneurs, the best results (in terms of generating employment and output) would be achieved if they were channelled towards those entrepreneurs with high personality scores, which implies not only proactivity, but also commitment to others, and efficiency orientation. Special attention should be paid to assess the presence of the last of these. At present small enterprise development programmes and financial institutions do attempt to gauge the personality of the entrepreneur, but look mostly to aspects that relate to entrepreneurship per se, not to successful entrepreneurship. For example the most successful and promoted entrepreneurship development programme (the Entrepreneurship Development Institute, Ahmadabad, India) looks for characteristics like need achievement, risk taking, positive self concept, problem solving ability, optimism about the future, information seeking, and time bound planning (Bhatt et. al., 1990 p. 45-46: van der Wees 1987: Harper 1983). Most other institutions seeking to provide assistance to entrepreneurs look for even less.

Notes

1. The Rural Industrial Programme and the Self Employment Scheme.

2. Punjab Small Industries Corporation.

3. Peter Kilby (1971) relates the entrepreneur to the mythical animal called the heffalump which nobody has ever seen.

4. To identify successful entrepreneurs, McBer and Co. used the nomination technique, whereby people in the field were asked to nominate successful entrepreneurs. Those entrepreneurs most commonly nominated as successful were included in the sample as successful entrepreneurs. Those less frequently nominated were included as average entrepreneurs.

5. Firms of employment size 5 to 50, which had been in production for at least five years were included in the sample.

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