# COMPILATION OF RESEARCH WORK:
## CASE STUDY OF ECONOMICS DEPARTMENT OF HIMACHAL PRADESH UNIVERSITY, SHIMLA

**Saptarshi Chakraborty[2]**

**ABSTRACT**

*The purpose of the present study is not only to prepare a simple descriptive compilation of the research done in the Economics Department of the Himachal Pradesh University, Shimla but also to analyse the different dimensions of it and to explore the hidden information in an apparently simple list of research. This paper looks at the record of research through the lens of economics as a social science. The list seems to be quite revealing not only in terms of the varied subjects that have been analysed through these research outputs but also in terms of several cross-sectional and inter-temporal patterns that are coming out through close scrutiny. This paper tries to look at the list of research from the perspective of their relevance in the economic lives of the people of the state, its regions and also of the country as a whole. But this series of works not only gives us its probable effectiveness in different areas of the economy but also explicates the individual efforts through the involvement of very many researchers both as students and as supervisors. Our enquiries are designed at several levels: first we try to find out the trends of research over time; secondly, we look at the researchers and try to find out some quantitative as well as qualitative trends involving them; thirdly, we try to find out the diversity of research performed by these analysts; next we explore the different dimensions of the bulk of research itself. In order to test our hypotheses we needed to collect and utilise data systematically and use appropriate mathematical and statistical tools. To capture the research output of the Department of Economics, HPU this paper selected the list of Ph.D.s done and in progress purposively as an indicator and utilised this data set in stylised manner using Excel software to test our hypotheses.*

**INTRODUCTION**

The purpose of the present study is not only to prepare a simple descriptive compilation of the research done in the Economics Department of the Himachal Pradesh University, Shimla but also to analyse the different dimensions of it and to explore the hidden information in an apparently simple list of research.

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[2] Associate Prof in Economics and TIC, Panchakot Mahavidyalaya, Sarbari, Neturia, Purulia, WB, India.

Documentation of a series of records could be done in different ways with different objectives having varied orientations. The same series of records could be interpreted from several view points: from the perspective of simple quantitative records, from the perspective of library documentation, from the perspective of performance appraisal or from a more social perspective. In our case, this paper looks at the record of research through the lens of economics as a social science. The list seems to be quite revealing not only in terms of the varied subjects that have been analysed through these research outputs but also in terms of several cross-sectional and inter-temporal patterns that are coming out through close scrutiny. We try to look at the list of research from the perspective of their relevance in the economic lives of the people of the state, its regions and also of the country as a whole. In a sense we try to look into the probable effects of this bulk of knowledge on the dynamics of our economy. But this series of works not only gives us its probable effectiveness in different areas of the economy but also explicates the individual efforts through the involvement of very many researchers both as students and as supervisors. Not only the research itself but also the researchers attract our attention. Thus we try to find out not only several patterns of creations in economics but also some pattern involving their creators. Though apparently we have some quantitative information, if we go deeper, interestingly enough we find important qualitative information over and above simple statistical observations.

## OBJECTIVE OF STUDY

As we have already mentioned, we would try to look at the volumes of research in economics from the very perspective of the discipline and hence we have specific enquiries. Our enquiries are designed at several levels: first we try to find out the trends of research over time; secondly, we look at the researchers and try to find out some quantitative as well as qualitative trends involving them; thirdly, we try to find out the diversity of research performed by these analysts; next we explore the different dimensions of the bulk of research itself. To delineate the objectives or research more explicitly, this paper tries:

1. to study the general trend of research done over time in the Department of Economics, HPU, Shimla.
2. to look at the involvement of the faculty in these works; in this context we take into account both the completed works and the on going research.
3. to look at this volume of research from gender perspective.
4. to study the diversity of research itself in terms of several specified subject groups.

5.  to study the pattern of occurrence of these broadly defined subjects of research over time.

6.  to capture the extent of diversity of research in terms of these subject groups carried out under the supervision of each faculty concerned.

7.  to move towards the focus of research on different regions of the country. First we look at the focus of research already done and in progress on Himachal Pradesh and otherwise and also that from the perspective of the broad subject groups mentioned earlier.

8.  to look at the division of the overall research completed in terms of its focus on Himachal Pradesh and otherwise.

9.  to try to find out the extent of focus of research done and also on going on the state of Himachal Pradesh as a whole and on its different districts, regions and localities.

10. lastly to try to look at the extent of research done and currently undertaken on Indian economy as a whole.

## HYPOTHESES

Base on our objectives of study we formulate the following hypotheses:

1.  we hypothesise that in general there is a rising trend of research done over time in the Department of Economics, HPU, Shimla.

2.  we hypothesise that there is non-skewed involvement of the faculty in these works; in this context we take into account both the completed works and the on going research.

3.  we hypothesise that there is gender bias in favour of male so far as the research scholars are concerned. But we also hypothesise that this bias is getting corrected over time.

4.  we hypothesise that the diversity of research itself in terms of several specified subject groups is getting increased over time, i.e. all the subject groups are researched more and more across time.

5.  we hypothesise that the pattern of occurrence of these broadly defined subjects of research over time is becoming smooth. In other words, our hypothesis is that all the subject groups are chosen for research more and more frequently in latter periods.

6.  we hypothesise that the extent of diversity of research in terms of these subject groups carried out under the supervision of each faculty concerned is evenly distributed across the faculty group.

7.  next we hypothesise that the focus of research already done and in progress on Himachal Pradesh and otherwise is becoming non-skewed in the sense

that both Himachal Pradesh and other areas of the country are appearing more frequently as focus of research in recent times compared to the earlier periods. We also hypothesise that from the perspective of the broad subject groups mentioned earlier there is no bias in terms of research on Himachal Pradesh and otherwise.

8. we hypothesise that the division of the overall research completed in terms of its focus on Himachal Pradesh and otherwise is non-skewed.

9. similar hypothesis is constructed for on going research as well.

10. we hypothesise that the extent of focus of research done and also on going on the state of Himachal Pradesh as a whole and on its different districts, regions and localities is non-skewed.

11. lastly we hypothesise that the extent of research done and currently undertaken on Indian economy as a whole is considerable.

## METHODOLOGY

In order to test our hypotheses we need to collect and utilise data systematically and use appropriate mathematical and statistical tools.

To capture the research output of the Department of Economics, HPU we selected the list of Ph.D.s done and in progress purposively as an indicator. The list contained the year of award of degree for completed Ph.D.s. For all the research undertaken both completed and on going the researchers' names with gender, the supervisors' names and the topic title are clearly mentioned. Total 88 Ph.D.s have been completed and another 19 are on going. We utilised this data set in stylised manner using Excel software to test our hypotheses. We utilise 'Introductory Econometrics' by J. M. Wooldridge for the theoretical background of our representation of data.

1. to test our hypothesis that in general there is a rising trend of research done over time in the Department of Economics, HPU, Shimla we have utilised the statistical line diagram and the statistical trend line.

2. to test our hypothesis that there is non-skewed involvement of the faculty in these works we have constructed horizontal bar chart across all the faculty members mentioned in the stated list of Ph.D.; in this context we take into account both the completed works and the on going research.

3. to test our hypothesis that there is gender bias in favour of male so far as the research scholars are concerned we have calculated the number of Ph.D.s done and in progress by male and female candidates separately. But to test our additional hypothesis that this bias is getting corrected over time we have derived the line diagrams and trend lines across years for both male and female candidates separately with completed Ph.D. and compared them.

4. to test our hypothesis that the diversity of research itself in terms of several specified subject groups is getting increased over time first we have divided the topics of completed and on going research into ten broad subject categories (some Ph.D.s falling under more than one category) such as, agriculture, industry, money and public finance, socio economic development, trade, resource and environment, gender – health – education, rural non-agricultural employment, employment and income and a tenth category of 'others'. Next, we formulate a table specifying the number of Ph.D.s done and in progress in each of these ten subject categories and subsequently show this tabular information through bar diagram. Finally, we derive line diagram along with trend line for each subject category (of completed research) across time to derive the relative performance in various subjects over the years; we try to study whether the trend lines are converging or diverging.

5. to test our hypothesis that the pattern of occurrence of these broadly defined subjects of research over time is becoming smooth, i.e. to test our hypothesis that all the subject groups are chosen for research more and more frequently in latter periods we utilise the trends lines derived trough the methodology mentioned in previous paragraph.

6. to test our hypothesis that the extent of diversity of research in terms of these subject groups carried out under the supervision of each faculty concerned is evenly distributed across the faculty group we have utilised the Simpson's Diversification Index (see Joshi et. al. 2004). The index SDI = $1 - [\sum P_i^2 / (\sum P_i)^2]$, where $P_i$ stands for number of Ph.D.s supervised and currently being supervised by a faculty member in 'i' th subject group with i = 1,2,3…………10, as there are ten subject categories designed as above.

7. next to test our hypothesis that the focus of research already done on Himachal Pradesh and otherwise is becoming non-skewed in the sense that both Himachal Pradesh and other areas of the country are appearing more frequently as focus of research in recent times compared to the earlier periods we find out the line diagrams and trend lines of work on Himachal Pradesh and otherwise. To test also the hypothesis that from the perspective of the broad subject groups mentioned earlier there is no bias in terms of research on Himachal Pradesh and otherwise we formulate bar diagram for each of the ten subject categories having Himachal and non-Himachal divisions.

8. to test our hypotheses that the division of the overall research completed and on going in terms of its focus on Himachal Pradesh and otherwise is non-skewed and the extent of focus of research done and also in progress on the

state of Himachal Pradesh as a whole and on its different districts, regions and localities is non-skewed we construct two separate pie-charts for completed and current works respectively.

9. lastly, to test our hypothesis that the extent of research done and currently undertaken on Indian economy as a whole is considerable we construct two pie-charts for completed and on going works respectively.

## ANALYSIS OF DATA

In order to test our hypotheses we need to utilise our data systematically and use appropriate mathematical and statistical tools.

As mentioned earlier total 88 Ph.D.s have been completed and another 19 are on going.

1. to test our hypothesis that in general there is a rising trend of research done over time in the Department of Economics, HPU, Shimla we have utilised the statistical line diagram and the statistical trend line as in **figure 1**.
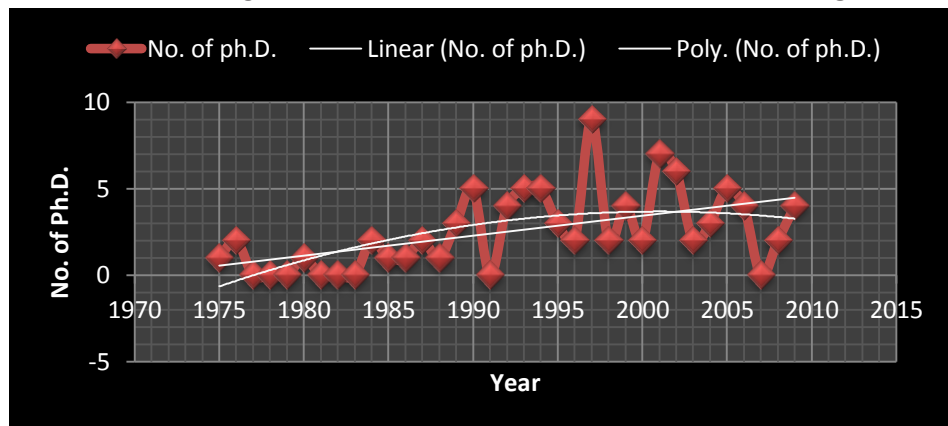


The linear trend is visibly upward rising though with substantial fluctuations. But a very important result emerges if we fit a curvilinear trend. We find that the trend of number of completed Ph.D.s is rising till 2000 from 1975, but after that it starts to fall!

2. to test our hypothesis that there is non-skewed involvement of the faculty in these works we have constructed horizontal bar chart across all the faculty members mentioned in the stated list of Ph.D. as in **figure 2**; in this context we take into account both the completed works and the on going research together. However, we get a much skewed distribution with lowest value of 1 and highest value of 14. But it has an almost smooth rise from the value of

1    to    14    having    many    values    in    between    the    two.

**Number of Supervision given by the Faculty Members**
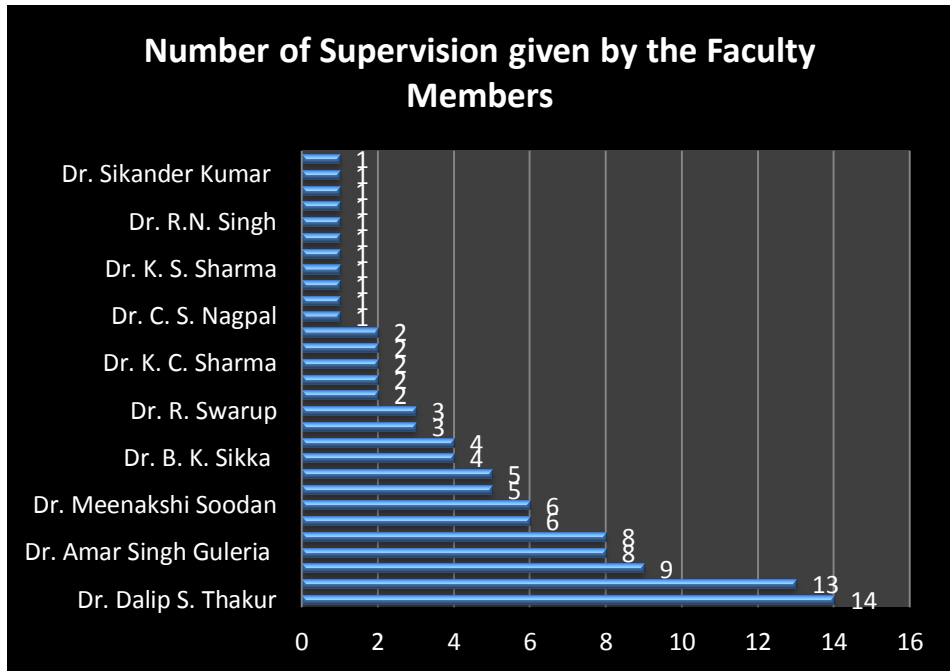


3.  To test our hypothesis that there is gender bias in favour of male so far as the research scholars are concerned we have calculated the number of Ph.D.s done and in progress by male and female candidates separately. We construct two pie-charts: **figure 3 and 4**
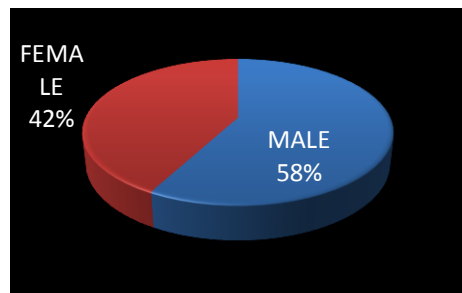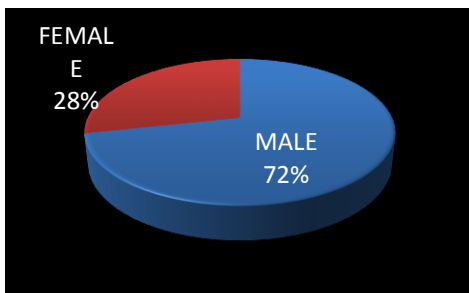


respectively for completed and  on  going works. For completed works only 28% of Ph.D.s is done by female scholars. However, so far as the on going works are concerned the female contribution has increased substantially from the earlier 28% to 42%. This is of course a positive sign so far as male – female contribution in research is concerned. But to test our additional hypothesis that this bias is getting corrected over time we have derived the line diagrams and trend lines across years for both male and female candidates separately with completed Ph.D. and compared them    as    in    **figure    5**.    We    find    that    both    the    lines    are
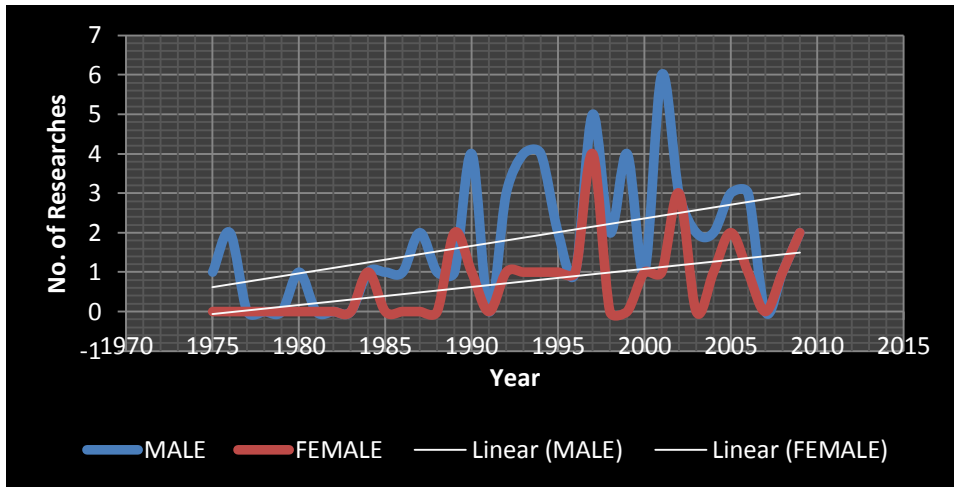
substantially fluctuating but both the trend lines are upward rising though trend line for male is placed much higher than that of the female. However, there is growing divergence between the two trend lines showing increasing male – female gap.
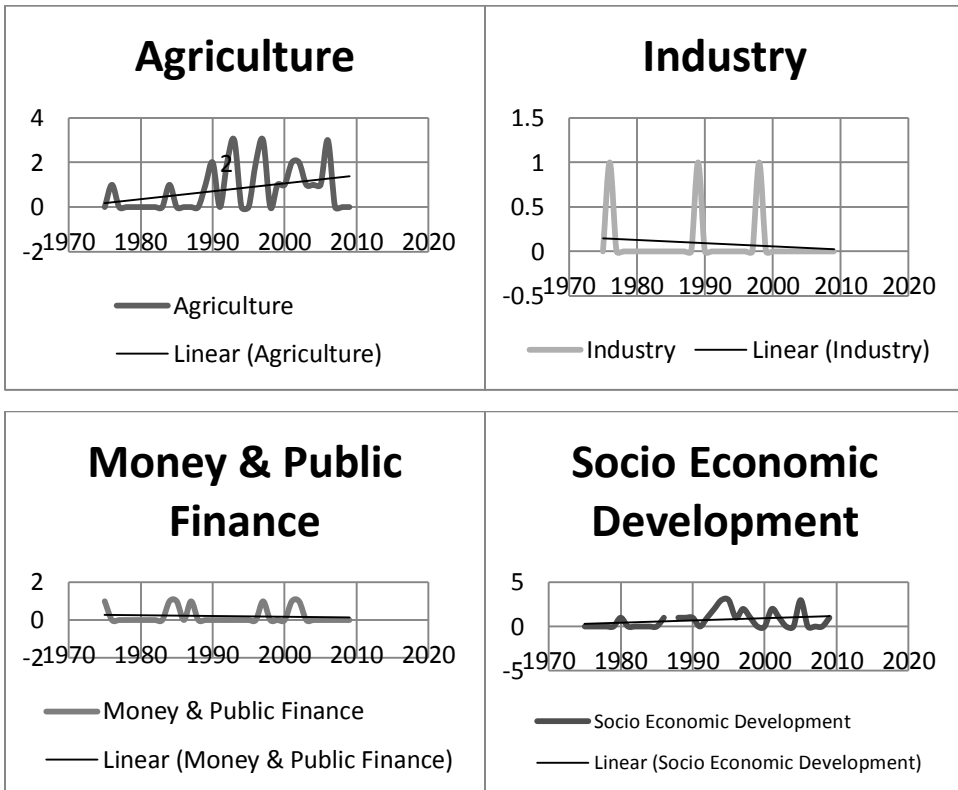
4. to test our hypothesis that the diversity of research itself in terms of several specified subject groups is getting increased over time first we have divided the topics of completed and on going research into ten broad subject categories (some Ph.D.s falling under more than one category) such as, agriculture, industry, money and public finance, socio economic development, trade, resource and environment, gender – health – education, rural non-agricultural employment, employment and income and a tenth category of 'others'. Next, we formulate the **table 1**
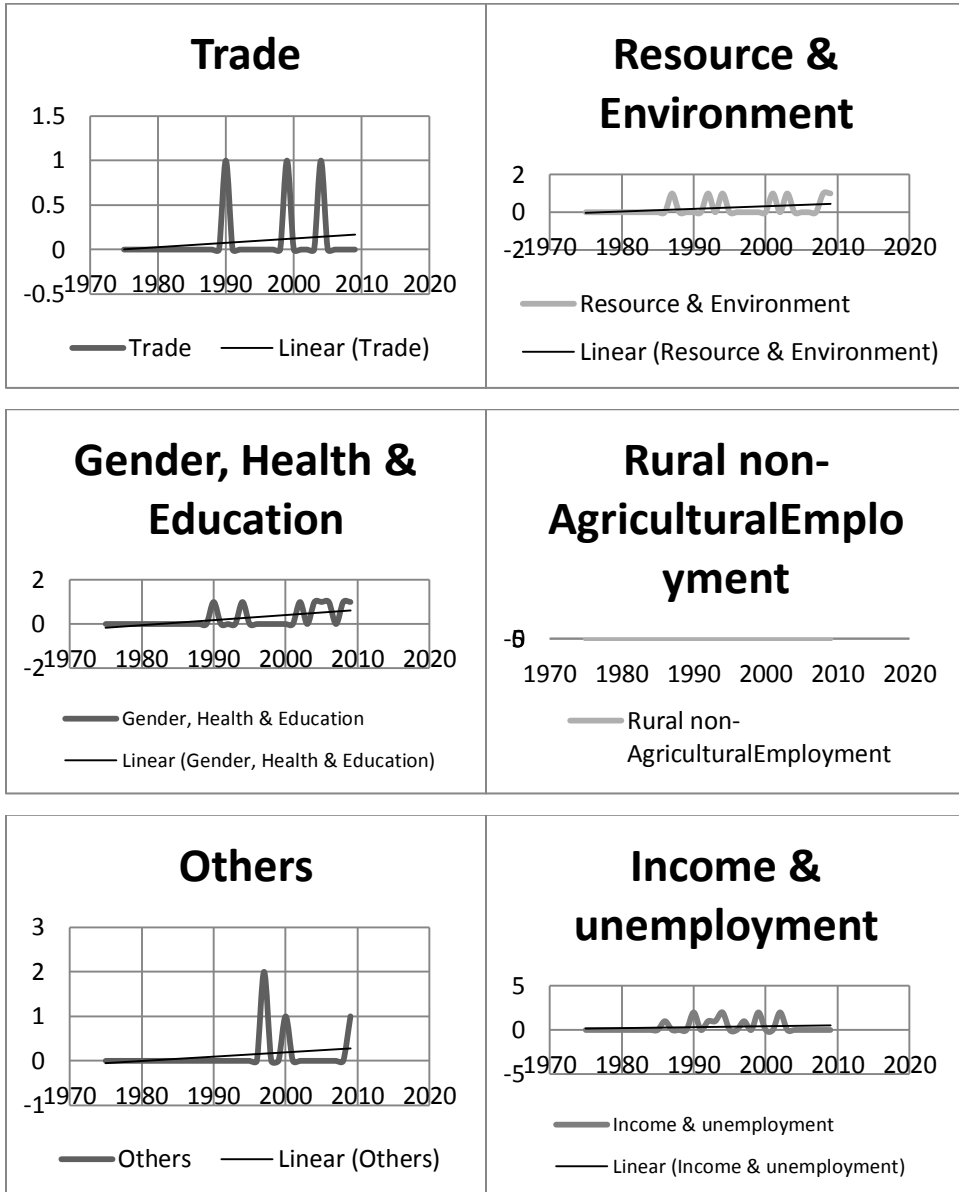
| Subject | done | in progress |
|---|---|---|
| Agriculture | 27 | 3 |
| Industry | 3 | 1 |
| Money & Public Finance | 7 | 2 |
| Socio Economic Development | 24 | 2 |
| Others | 4 | 2 |
| Trade | 3 | 0 |
| Resource & Environment | 7 | 5 |
| Gender, Health & Education | 8 | 3 |
| Rural non-AgriculturalEmployment | 5 | 1 |
| Employment & Income | 12 | 4 |

specifying the number of Ph.D.s done and in progress in each of these ten subject categories and subsequently show this tabular information through bar diagram as in **figure 6**. Table 1 and figure 6 show that agriculture,
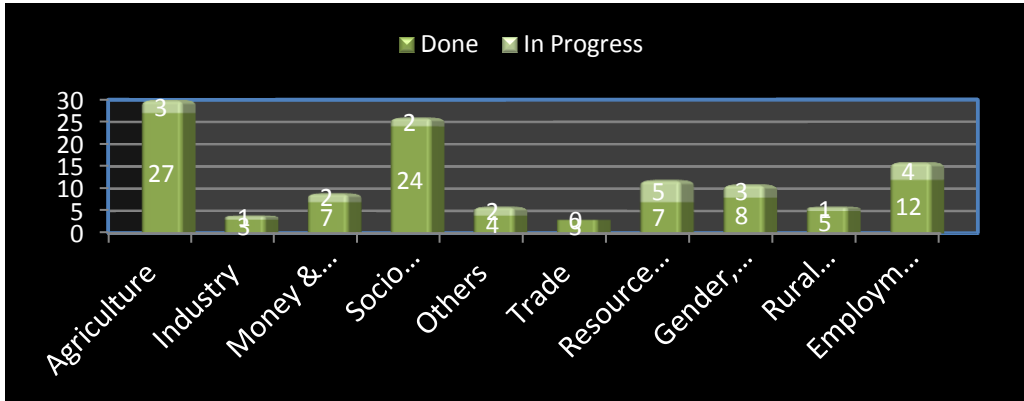
socio-economic development and the category of employment and income attract much attention trade and industry being much less researched. Finally, we derive line diagram along with trend line for each subject category (of completed research) across time as in **figure 7** to derive the

## Trade



## Resource & Environment



## Gender, Health & Education



## Rural non-AgriculturalEmployment



## Others



## Income & unemployment



relative performance in various subjects over the years; we try to study whether the trend lines are converging or diverging. From figure 7 we find that: trend of agriculture is steeply rising though with substantial fluctuations, the trend of industry is falling and the line shows only three positive movements around 1976, 1989 and 1997, the trend line for money and public finance is slightly downward sloping and the line diagram shows only five positive peaks around 1975, 1984, 1986, 1996 and 2001-02, trend line of socio-economic development is steeply rising though with substantial fluctuations, trend for trade is slightly rising with only three positive peaks around 1990, 1999 and 2004, resource and environment has performed little

better with little steeper trend line and with six positive peaks around 1996, 1992, 1994, 2001, 2003 and 2008, gender – health – education shows similar trend, line diagram for rural non-agricultural employment shows peculiar behaviour with only three close positive peaks in 1997, 1999 and 2001-02, the category of others is also less important, the category of employment and income has shown positive values in several years with slightly rising trend. Thus from figure 7 we find that agriculture, socio-economic development and gender – health – education show substantial positive trend and other subject categories are either showing falling trend or only slightly rising trend. Thus it seems that there no sign of convergence between the trends of research.

5.  to test our hypothesis that the pattern of occurrence of these broadly defined subjects of research over time is becoming smooth, i.e. to test our hypothesis that all the subject groups are chosen for research more and more frequently in latter periods we utilise the trends lines derived in figure 7 above. We find that the line diagrams are highly fluctuating over time with very low sign of smoothness.

6.  to test our hypothesis that the extent of diversity of research in terms of these subject groups carried out under the supervision of each faculty concerned is evenly distributed across the faculty group we have utilised the Simpson's Diversification Index (see Joshi et. al. 2004). The index $SDI = 1 - [\sum P_i^2 / (\sum P_i)^2]$, where $P_i$ stands for number of Ph.D.s supervised and currently being supervised by a faculty member in 'i' th subject group with i = 1,2,3…………10, as there are ten subject categories designed as above. According to the SDI we have derived bar diagram as in **figure 8**. We find
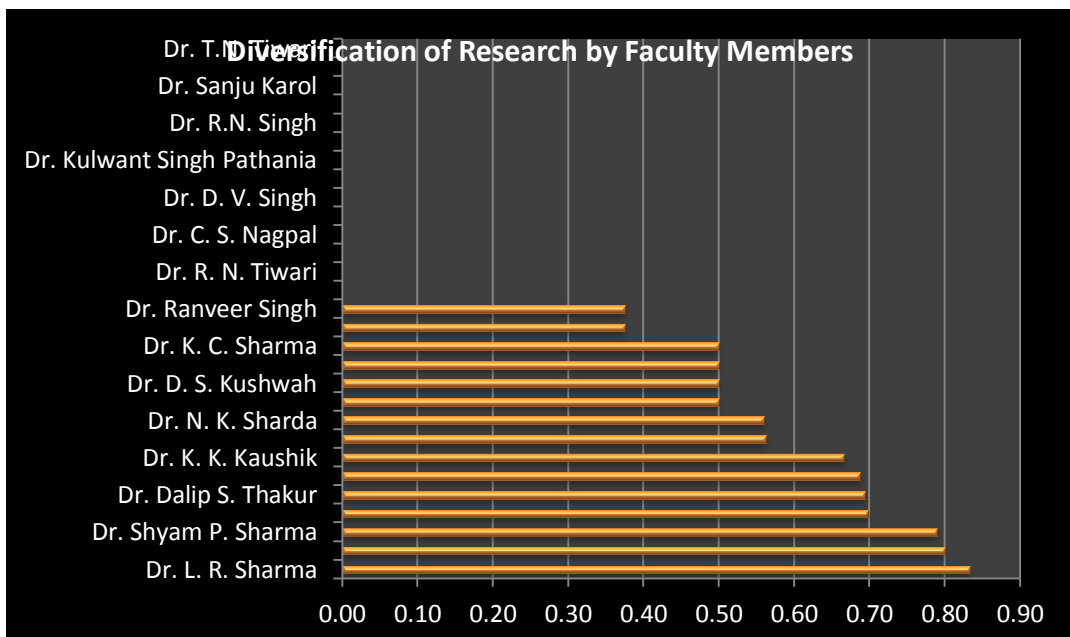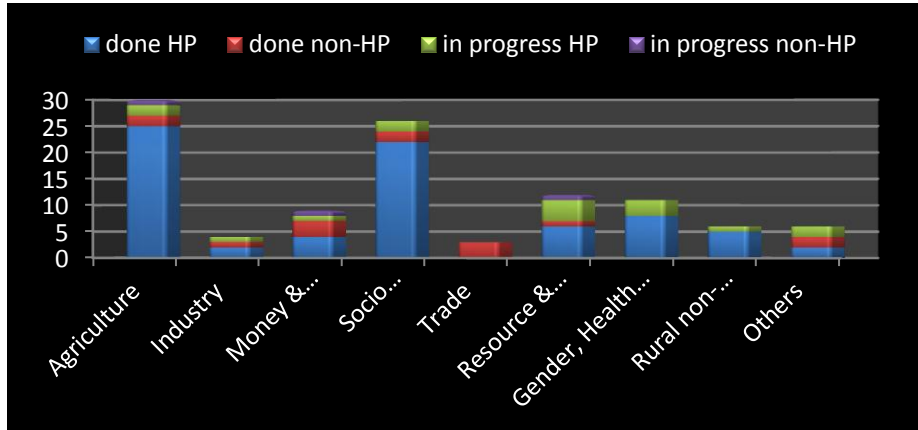


Diversification of Research by Faculty Members

that the SDI values are highly skewed with almost half of the faculty members having zero value of diversification. For the other half, there is a sudden jump of SDI value from 0 to 0.38 (approx.) and then it goes on increasing even up to 0.84 (approx.) showing very high degree of diversification.

7. next to test our hypothesis that the focus of research already done on Himachal Pradesh and otherwise is becoming non-skewed in the sense that both Himachal Pradesh and other areas of the country are appearing more frequently as focus of research in recent times compared to the earlier periods we find out the line diagrams and trend lines of work on Himachal Pradesh and otherwise as in **figure 9**. Though during the interim
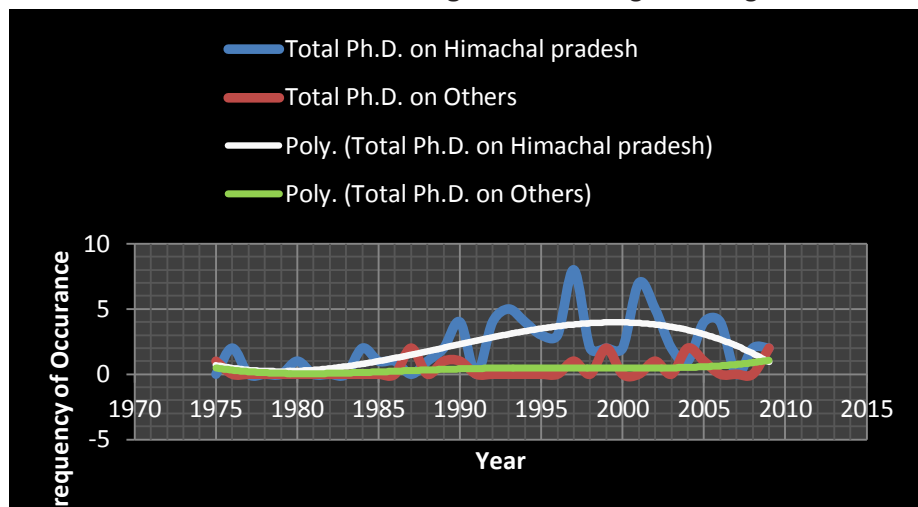


period (approximately 1995 to 2005) there is large gap between Himachal and non-Himachal works, lately the gap has reduced considerably due both drastic fall in the trend for Himachal and some rise in the trend of non-Himachal works. To test also the hypothesis that from the perspective of the broad subject groups mentioned earlier there is no bias in terms of research on Himachal Pradesh and otherwise we formulate bar diagram for each of the ten subject categories having Himachal and non-Himachal divisions as in **figure 10**. But we find clearly that work on

Himachal dominates for almost all subject categories while we take the Ph.D.s already completed. If we consider the research in progress, categories like agriculture, money and public finance and resource and environment show some works compared to research on Himachal. However, research in the field of trade has been done only for non-Himachal studies.

8. to test our hypotheses that the division of the overall research completed and on going in terms of its focus on Himachal Pradesh and otherwise is non-skewed and the extent of focus of research done and also in progress on the state of Himachal Pradesh as a whole and on its different districts, regions and localities is non-skewed we construct two separate pie-charts for completed and current works respectively as in **figure 11 and 12**.
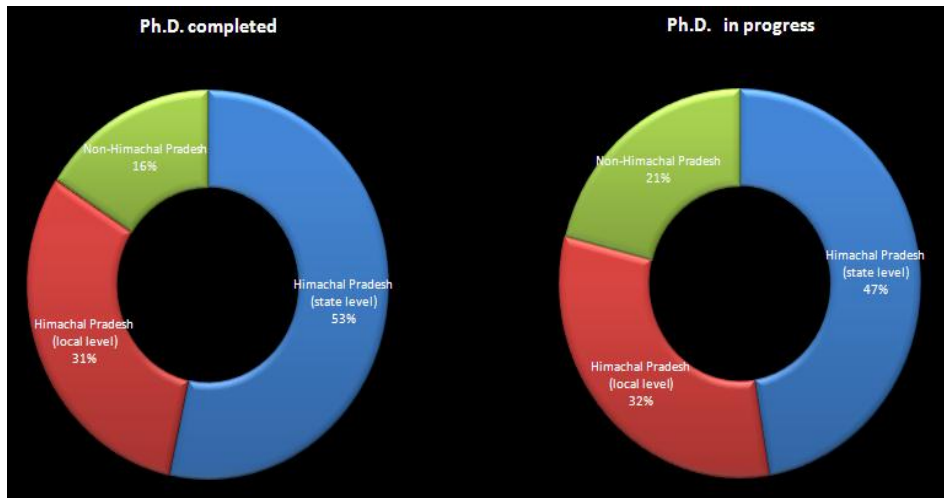


Figure 11 shows that overwhelming majority of work is done on Himachal Pradesh compared to non-Himachal work with some bias in favour of the state based work rather than works on its districts and localities. However, from figure 12 it is found that so far as the on going works are concerned

non-Himachal based works' proportion has increased at the cost of mainly the state-level works on Himachal.

9. lastly, to test our hypothesis that the extent of research done and currently undertaken on Indian economy as a whole is considerable we construct two pie-charts for completed and on going works respectively as in **figure 13 and 14**. Unfortunately research on India as a whole is very low and it dwindles even further if we look at the on going works.
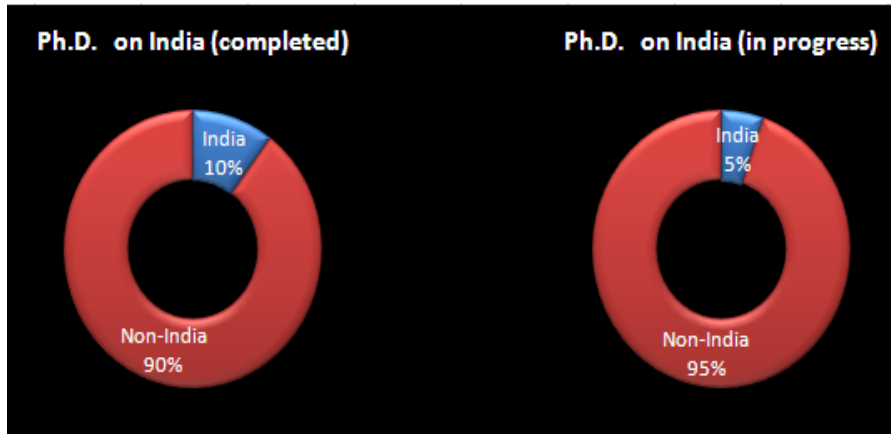


**CONCLUSION**

Analysing the list of 88 completed and 19 on going Ph.D.s of the Department of Economics, HPU, Shimla we get the following outcomes:

First we find that the trend of number of completed Ph.D.s is rising till 2000 from 1975, but after that it starts to fall! Secondly, so far as involvement of the faculty in these works is concerned we find that a much skewed distribution with lowest value of 1 Ph.D. and highest value of 14. But it has an almost smooth rise from the value of 1 to 14 having many values in between the two. Next, we find that for completed works only 28% of Ph.D.s is done by female scholars. However, so far as the on going works are concerned the female contribution has increased substantially from the earlier 28% to 42%. But testing our additional hypothesis that this bias is getting corrected over time we have derived trend lines across years for both male and female candidates and found that though both the trend lines are upward rising, trend line for male is placed much higher than that of the female and there is growing divergence between the two trend lines showing increasing male – female gap. Testing our hypothesis that the diversity of research itself in terms of several specified subject groups is getting increased over time we find that agriculture, socio-economic development and the category of employment and income attract much attention, trade and industry being much less researched. Furthermore, we find that

agriculture, socio-economic development and gender – health – education show substantial positive trend and other subject categories are either showing falling trend or only slightly rising trend. Thus it seems that there no sign of convergence between the trends of research. Testing our hypothesis that the extent of diversity of research in terms of these subject groups carried out under the supervision of each faculty concerned is evenly distributed across the faculty group we have utilised the Simpson's Diversification Index. According to the SDI we find that the SDI values are highly skewed with almost half of the faculty members having zero value of diversification. For the other half, there is a sudden jump of SDI value from 0 to 0.38 (approx.) and then it goes on increasing even up to 0.84 (approx.) showing very high degree of diversification.

Testing our hypothesis that the focus of research already done on Himachal Pradesh and otherwise is becoming non-skewed in the sense that both Himachal Pradesh and other areas of the country are appearing more frequently as focus of research in recent times compared to the earlier periods we find out that though during the interim period (approximately 1995 to 2005) there is large gap between Himachal and non-Himachal works, lately the gap has reduced considerably due both drastic fall in the trend for Himachal and some rise in the trend of non-Himachal works. Testing also the hypothesis that from the perspective of the broad subject groups mentioned earlier there is no bias in terms of research on Himachal Pradesh and otherwise we find clearly that work on Himachal dominates for almost all subject categories while we take the Ph.D.s already completed. If we consider the research in progress, categories like agriculture, money and public finance and resource and environment show some works compared to research on Himachal. However, research in the field of trade has been done only for non-Himachal studies. We also find that overwhelming majority of work is done on Himachal Pradesh compared to non-Himachal work with some bias in favour of the state based work rather than works on its districts and localities. However, it is also found that so far as the on going works are concerned non-Himachal based works' proportion has increased at the cost of mainly the state-level works on Himachal. However, unfortunately research on India as a whole is very low and it dwindles even further if we look at the on going works.

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