



# **YASHWANTRAO CHAVAN MAHAVIDYALAYA, HALKARNI**

(Affiliated to Shivaji University Kolhapur)  
Tal-Chandgad, Dist-Kolhapur-416552

Re Accredited by NAAC at the B  
I/C Principal-Dr.P.Y.Nimbalkar M.A, M.Phil, Ph.D.

REF No: DVS/YCC/ 59 /2017-18

Date: 27 / 06 /2017

To,  
The Deputy Secretary  
Selection & Award Bureau  
University Grants Commission  
Bahadurshah Zafar Marg,  
New Delhi-110002

Sub: Final Report

Ref: **No. F. 30-1/2014/RA-2014-16-GE-MAH-5958 (SA-II)** Date: 20 Feb, 2015.

Ref: **No. F. 30-59/2015 (SA-II)** Date: 10 November, 2015.

Respected Sir,

With reference to your above cited letters **Dr. Ashok Vithoba Dorugade**, Department of Statistics, Yashwantrao Chavan Mahavidyalaya, Halkarni working as Research Awardee and received the grants-in-aid in respect of towards Salary and Research grant for the year 2015-2016 under plan to complete the proposed work under Research Award scheme by UGC for the year 2014-16. We have already submitted the utilisation certificates (Ref. No.: DVS/YCC/32/2015-16 Date: 30/04/2016) along with related documents of the total utilized grant during the period 01-03-2015 to 29-02-2016 in your prescribed format. As per joining report tenure of the said project is over dated on 28/02/2017, but till today we have not received the Salary and Research grant as second year grant for the year 2016-2017. However in order to follow scheme guidelines and avoid the delay in submitting final report of the work done in stipulated period of the same project herewith I am sending the utilisation certificates of the total utilized grant and final report of the work done along with enclosed related documents during the total period 01-03-2015 to 28-02-2017 in your prescribed format. Kindly accept the same and please do needful.

Thanking You,



Yours Faithfully,

*(Signature)*  
I/C PRINCIPAL

Yashwantrao Chavan College  
HALKARNI 416 552  
Tal. Chandgad, Dist. Kolhapur

## **Enclosure:**

1. Final Report (ANNEXURE - IV).
2. Utilisation Certificate (ANNEXURE - V).
3. Accounts of contingency grant and utilisation certificate (ANNEXURE - III).
4. Summary of the Work Done.
5. Monograph entitled "Work Done Report on UGC Research Award Scheme 2014-16".
6. DVD containing soft copy of above enclosures from 1 to 5.



ज्ञान-विज्ञान विमुक्तये

UNIVERSITY GRANTS COMMISSION  
(SELECTION & AWARD BUREAU)  
BAHADUR SHAH ZAFAR MARG,  
NEW DELHI - 110 002

## **FINAL REPORT**

**(From 01/03/2015 to 28/02/2017)**

1. Name of the Awardee : **Dr. Ashok Vithoba Dorugade**
2. Award letter number and date: **No. F. 30-1/2014/RA-2014-16-GE-MAH-5958 (SA-II),**  
**Date: 20 February, 2015.**
3. Topic of research work: **Post Variable Selection Analysis in Regression**
4. Is the Awardee working on the topic for the award of a doctorate degree: **No**
5. Total number of working days during the period: **580**
6. Number of days the awardee remained on leave (with dates):
  - a. With Salary number of days : **18** [07-03-2015, 09-03-2015, 28 to 29-07-2015, 23-10-2015, 09-12-2015, 12 to 13-01-2016, 30-03-2016 to 31-3-2016, 1-04-2016 to 02-04-2016, 16-12-2016 to 22-12-2016, 28-01-2017, 21-02-2017 to 26-02-2017]
  - b. Without Salary number of days : **00**
7. Number of days the awardee remained out of station for fieldwork / travel with dates and places visited:

Sr.No.	Number of days	Date: From_____to_____	Place Visited
1	02	25-09-2015 to 26-09-2015	Department of Statistics, Balwant College, Vita, Maharashtra
2	02	15-09-2015 to 16-09-2015	Department of Statistics, SGM, College Karad, Maharashtra
3	05	20-12-2015 to 24-12-2015	Department of Statistics, Savitribai Phule Pune University, Maharashtra
4	10	19-02-2016 to 28-02-2016	ISRU, Indian Statistical Institute, Kolkata
6	02	11-03-2016 to 12-03-2016	Department of Statistics, Shivaji University, Kolhapur, Maharashtra
7	05	16-12-2016 to 20-12-2016	Department of Statistics & Operations Research, Aligarh Muslim University, Aligarh (India)

8	05	21-02-2017 to 25-02-2017	Department of Statistics, Acharya Nagarjuna University, Guntur (A.P.)
9	02	10-03-2017 to 11-03-2017	Department of Statistics, Shivaji University, Kolhapur, Maharashtra
10	15	08-03-2015, 26-04-2015, 17-05-2015, 24-05-2015, 26-07-2015, 13-08-2015, 22-11-2015, 27-12-2015, 24-01-2016 and other	Department of Statistics, Shivaji University, Kolhapur, Maharashtra

8. Number of days the awardee remained present at the University / Institution / College: **580**

9. Publications during the period under the report (Reprint of each is enclosed) : **04**

Title of article / paper:

- Dorugade, A.V. (2016), Adjusted ridge estimator and comparison with Kibria's method in linear regression, *Journal of Association of Arab Universities for Basic and Applied Sciences*. Vol. 21, 96-102.
- Dorugade, A.V. (2016), Improved Ridge Estimator in Linear Regression with Multicollinearity, Heteroscedastic Errors and Outliers, *The Journal of Modern Applied Statistical Methods*. Vol. November 15(2), 362-381.
- Dorugade, A.V. (2015), Correlation based ridge parameters in Ridge Regression with Heteroscedastic Errors and Outliers, and Outliers, *Journal of Statistical Theory and Applications*. Vol. 14 (4), 413-424.
- Dorugade, A.V. (2016), Alternative to Ridge Estimator without Ridge Parameter, *The Journal of Basic and Applied Research international*. Vol. 13(3), 170-184.

10. Title of the monograph written during the period under report: -

"Work Done Report on UGC Research Award Scheme 2014-16"

11. Detail account of the work done during the period.

- Summary (attached in separate sheet)
- Monograph entitled "Work Done Report on UGC Research Award Scheme 2014-16" (Attached separately)

(Dr. Ashok Vithoba Dorugade)  
**Candidate**

(Dr. A V Dorugade)  
**Head of the Deptt.**

(Dr. P Y Nimbalkar)  
**Principal**

Yashwantrao Chavan College  
HALKARNI - 416 552  
Tal. Chandgad, Dist. Kolhapur.







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UNIVERSITY GRANTS COMMISSION  
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NEW DELHI - 110 002

**UTILISATION CERTIFICATE**

(From 01/03/2015 to 28/02/2017)

Certified that an amount (salary + research grant) of **Rs. 19,38,957/-** (Rupees nineteen Lac thirty eight thousand and nine hundred fifty seven only) has been utilized out of the sanctioned grant (salary + research grant) of **Rs. 19,32,004/-** (Rupees nineteen Lac thirty eight thousand and nine hundred fifty seven only) for the purpose for which it was sanctioned in accordance with the terms and conditions laid down by the UGC in respect of **Dr. Ashok Vithoba Dorugade** under the scheme of Research Award, sanctioned vide letter number **No. F. 30-59/2015 (SA-II)**, dated **10 November, 2015** to the Dr. Ashok Vithoba Dorugade, Department of Statistics Yashwantrao Chavan Mahavidyalaya, Halkarni, Chandgad- 416552, Maharashtra. The unspent balance of Rs. **NA** has been carried forward / refund vide demand draft number **NA** dated **NA** for Rs. **NA**.

**If, as a result of check or audit objection, some irregularity is noticed at a later stage, action will be taken to refund, adjust or regularize the objected amount.**

(Dr. Ashok Vithoba Dorugade)  
**Candidate**

(Dr. A V Dorugade)  
**Head of the Deptt.**

(Dr. Pandurang Yashwant Nimbalkar)  
**Principal-**  
**Yashwantrao Chavan College**  
**HALKARNI - 416 552**  
**Tal. Chandgad, Dist. Kolhapur.**





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NEW DELHI - 110 002


**UTILISATION CERTIFICATE**

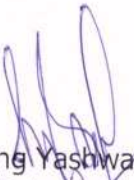
(From 01/03/2016 to 28/02/2017)

Certified that an amount (salary + research grant) of **Rs. 10,26,267/-** (Rupees Ten lac twenty six thousand two hundred sixty seven rupees only) has been utilized out of the sanctioned grant (salary + research grant) of **Rs. 10,26,164/-** (Rupees Ten lac twenty six thousand one hundred sixty four rupees only) for the purpose for which it was sanctioned in accordance with the terms and conditions laid down by the UGC in respect of **Dr. Ashok Vithoba Dorugade** under the scheme of Research Award, sanctioned vide letter number **No. F. 30-59/2015 (SA-II)**, dated **10 November, 2015** to the Dr. Ashok Vithoba Dorugade, Department of Statistics Yashwantrao Chavan Mahavidyalaya, Halkarni, Chandgad- 416552, Maharashtra. The unspent balance of Rs. **NA** has been carried forward / refund vide demand draft number **NA** dated **NA** for Rs. **NA**.

**If, as a result of check or audit objection, some irregularity is noticed at a later stage, action will be taken to refund, adjust or regularize the objected amount.**

  
(Dr. Ashok Vithoba Dorugade)  
**Candidate**

  
(Dr. A V Dorugade)  
**Head of the Deptt.**

  
(Dr. Pandurang Yashwant Nimbalkar)  
**Principal**  
**Yashwantrao Chavan College**  
**HALKARNI - 416 552**  
**Tal. Chandgad, Dist. Kolhapur.**





UNIVERSITY GRANTS COMMISSION  
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BAHADUR SHAH ZAFAR MARG,  
NEW DELHI - 110 002

**FORM FOR SUBMITTING ACCOUNTS OF CONTINGENCY GRANTS AND THE  
UTILISATION CERTIFICATE**

1. Name of the Awardee: **Dr. Ashok Vithoba Dorugade**
2. Award letter number and date: **No. F. 30-1/2014/RA-2014-16-GE-MAH-5958 (SA-II), dated 20 February, 2015**
3. Name of the scheme under which he/she is working : **UGC Research Award 2014-16**
4. Period for which the accounts of contingency grant relates: From 01/03/2015 to 28/02/2017
5. Expenditure

From: 01/03/2015 to 28/02/2017

Amount: 3,06,953 /- Dated: 28/02/2017


Items	Amount		
	First Year	Second Year	Total
a. Research Staff	-	-	-
b. Equipments (Laptop, Printer, Portable disc etc.)	66,850 /-	46,400 /-	1,13,250 /-
c. Books and allied items	30,000 /-	21,221 /-	51,221 /-
d. Typing (Tracing and ammonia printing)	30,000 /-	40,000 /-	70,000 /-
e. Stationary			
f. Postage			
g. Chemical and electrical goods	-	-	-
h. Travel and Field work	30,000 /-	42,482 /-	72,482 /-
<b>Grand Total</b>	<b>1,56,850 /-</b>	<b>1,50,103 /-</b>	<b>3,06,953 /-</b>


6. Period for which the contingency grant is payable: **From 01/03/2015 to 28/02/2017**

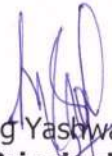


Certified that the expenditure of **Rs. 3,06,953 /-** (Rupees three Lac six thousand nine hundred and fifty three only) has been utilized out of the contingency grant of **Rs. 3,00,000 /-** (Rupees three Lac only), sanctioned vide Commission letter number **No. F. 30-59/2015 (SA-II)**, dated **10 November, 2015** in respect of **Dr. Ashok Vithoba Dorugade**, Department of Statistics Yashwantrao Chavan Mahavidyalaya, Halkarni, Chandgad- 416552, Maharashtra has been utilized for the purpose for which it was sanctioned in accordance with the terms and conditions laid down by the University Grants Commission.

**If, as a result of check or audit objection, some irregularity is noticed at a later stage, action will be taken to refund, adjust or regularize the objected amount.**

  
(Dr. Ashok Vithoba Dorugade)  
**Candidate**

  
(Dr. A V Dorugade)  
**Head of the Deptt.**

  
(Dr. Pandurang Yashwant Nimbalkar)  
**Principal**  
**Yashwantrao Chavan College**  
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**a. Summary of the work done during the period**

1. Name of the Awardee : **Dr. Ashok Vithoba Dorugade**
2. Award letter number and date: **No. F. 30-1/2014/RA-2014-16-GE-MAH-5958 (SA-II),**  
**Date: 20 February, 2015.**
3. Topic of research work: **Post Variable Selection Analysis in Regression**
4. Period of work done : **From 01/03/2015 to 28/02/2017**

After thorough literature survey including estimation methods like ridge regression, principal component regression, Lasso estimation, Liu estimator, M-estimator, restricted ridge regression estimator, Jackknifed ridge regression estimator, Generalized Jackknifed ridge regression estimator, Modified Jackknifed ridge regression estimator, generalized ordinary Jackknife ridge regression estimator etc. which gives better performance than Least Square estimator in the presence of multicollinearity, Outliers and Heteroscedasticity, it was concluded that there are only few methods or procedures for post variable selection analysis in the regression. Model selection has an important impact on subsequent inference. Kabaila (1995), Pötscher (1991, 1995, 1998, 2007) also consider the effect of model selection on prediction regions. Ignoring the model selection step leads to invalid inference. The parameters of the selected model are then estimated are called "post-model-selection estimators. Some research articles were studied in order to understand the recent trend in the subject. Due to poor performance of Least Square estimates of regression parameters variable selection methods leads to wrong subset selection in the presence of multicollinearity, Outliers and Heteroscedasticity. In the proposed work we have plan to studied impact of model selection on subsequent inference upon the model selection in the context of fitting appropriate (or correct) models. To reach the goal properly initially in an effort to overcome the problem of LS with multicollinearity, Outliers and Heteroscedasticity we try to suggest parameter estimation methods in such situations. The ridge



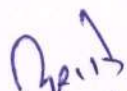
estimator suggested by Hoerl and Kennard is bench mark estimator in the context of estimators used in the presence of multicollinearity. In ridge regression, selection of biasing constant is important. Using ridge regression, numerous articles have been written for suggesting different ways of estimating the biasing constants including Hoerl and Kennard, Lawless and Wang, Masuo Nomura, Khalaf and Shukur, Dorugade and Kashid, Dorugade and others gives alternative method for determining biasing constant. Here also we try to suggest ridge parameter estimation method and shown the better performance of the same over other methods. We also suggest improved ridge estimator, Adjusted ridge estimator, Correlation based ridge estimator. There is no explicit formula for this ridge parameter. Many authors proposed different approximations for it. The conventional wisdom is that no single method would be uniformly better than all the others. Also, as pointed out by Liu (2003) when there exists severe multicollinearity the ridge parameter selected for ridge regression may not fully remedy the problem of multicollinearity. To avoid calculating the value of ridge parameter finally we suggest the estimator alternative to ridge estimator without any ridge parameter. All together suggested estimators and ridge estimator using suggested and reviewed ridge parameters are compared to each other in linear regression when data exhibits with multicollinearity, Outliers and Heteroscedasticity. Simulation results used in comparative study are generated using MATLAB code.

To acquire the depth in the proposed research work three National/International workshop/conference were attended whereas six research papers are presented in different National/International conference/seminars. The work done under completed research project was published in four different international journals where as few articles are communicated to different reputed journals for possible publications.

## References

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6. Dorugade A V, Kashid D N. 2010. Alternative Method for Choosing Ridge Parameter for Regression, *International Journal of Applied Mathematical Sciences*. 4(9): 447 - 456.
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24. Wong KY, Chiu SN (2015) An iterative approach to minimize the mean squared error in ridge regression. *Comput Stat* 30(2): 625–639.

  
 (Dr. Ashok Vithoba Dorugade)  
**Research Awardee**