Department of Economics and Statistics
Faculty of Arts, University of Peradeniya, Sri Lanka

PERADENIYA INTERNATIONAL ECONOMICS RESEARCH SYMPOSIUM - 2019

P I E R S

PROCEEDINGS

Volume VII

17TH AND 18TH OCTOBER 2019

CONFERENCE HALL, POSTGRADUATE INSTITUTE OF HUMANITIES AND SOCIAL SCIENCES (PGIHS)
UNIVERSITY OF PERADENIYA, SRILANKA

Joint Partner
Faculty of Economic Sciences and Business Administration
Transilvania University of Brasov, Romania

Supportive Partner
South Asian Economic Policy Network, World Bank, USA

Collaborative Partner
South Asian University, India

PIERS - 2019

PIERS - 2019

PROCEEDINGS

Volume VII

7TH PERADENIYA INTERNATIONAL ECONOMICS RESEARCH SYMPOSIUM (PIERS) – 2019

Jointly organized by
Department of Economics and Statistics, Faculty of Arts
University of Peradeniya, Sri Lanka
and
Faculty of Economic Sciences and Business Administration
Transilvania University of Brasov, Romania

Supportive Partner
South Asian Economic Policy Network, World Bank, USA

Collaborative Partner
South Asian University, India

on
17th & 18th October 2019

at
Postgraduate Institute of Humanities and Social Sciences (PGIHS)
University of Peradeniya
Sri Lanka

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DEPARTMENT OF ECONOMICS AND STATISTICS
FACULTY OF ARTS, UNIVERSITY OF PERADENIYA
SRI LANKA

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7TH PERADENIYA INTERNATIONAL ECONOMICS RESEARCH SYMPOSIUM - 2019

PIERS - 2019

PROCEEDINGS

Volume VII

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Dr. K. M. R. Karunarathna

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MESSAGE FROM THE VICE CHANCELLOR

University of Peradeniya

It is with great pleasure that I write this message on the occasion of the 7th Peradeniya University International Economic Research Symposium (PIERS) – 2019 to be held on 17th & 18th October 2019. This Research Symposium is an Annual Event in the University Calendar which provides a forum for academics, researchers and, expertise in the field of economics as well as in all other disciplines with reference to future planning and development of our country. The constructive feedback that the researcher would gather from deliberations may pave the way to new frontiers in research.

I assume that this symposium will create a valuable platform for international and national experts to discuss their research findings, share the new knowledge and exchange their views.

On behalf of the University of Peradeniya, I wish to express my deep gratitude to the distinguished speakers at this symposium and take this opportunity to compliment the Chairman and the Organizing Committee who had an enormous task at their hands in organizing this event to make a great success.

I welcome all participants and presenters to the University of Peradeniya and wish their participation at PIERS 2019, a memorable and rewarding experience.

Professor Upul B. Dissanayake
Vice-Chancellor
University of Peradeniya
Sri Lanka

MESSAGE FROM THE DEPUTY VICE CHANCELLOR

University of Peradeniya

It is with great pleasure that I send this message for the 7th Peradeniya International Economics Research Symposium. The PIERS, started in 2013, has now become an important event in the calendar of Faculty of Arts, University of Peradeniya. Research symposia of this nature provides a forum for Researchers, Academics and Graduate students to present their research findings, enabling further refinement of their knowledge. I believe that this kind of events would undoubtedly help students to learn and develop communication skills, presentation skills and teamwork, in addition to their hard skills. This is a great opportunity offered to staff and students by the Department of Economics and Statistics and I hope all the participants will make the maximum use of it.

As we all know, organizing this kind of an event annually is not an easy task. Teaching as well as guiding students in research is a vital task of Academics, which will eventually contribute to a larger hub of knowledge. Hence, I wish to congratulate the Head of the Department of Economics and Statistics, and the organizers of this Symposium for an excellent job well done. I firmly believe that this Symposium will bring a productive output in terms of Economic Research and Knowledge dissemination. I wish all the best to all presenters and participants, and hope you will take home pleasant memories from this event.

Thank you.

Prof. S. H. P. Parakrama Karunaratne
Deputy Vice Chancellor
University of Peradeniya
Sri Lanka.

MESSAGE FROM THE DEAN

Faculty of Arts, University of Peradeniya

It is with great honour that I convey this message of congratulations and appreciation to the PIERS-2019 organized by the Department of Economics and Statistics, Faculty of Arts, University of Peradeniya. The PIERS is an important academic event in the University of Peradeniya that has provided a vital forum for local and foreign scholars to present and share their research findings in economics, and develop insights to face the challenges faced by the society.

In my capacity as the Dean of the Faculty of Arts I assure the fullest support and cooperation to make the conference a success. I also appreciate the hard work of the members of the Department of Economics and Statistics for organizing this. It is imperative that the economic problems are complex and evolving that demands more and more complex ways of analyzing and understanding them. As economics is still a young science, there is much to be learnt and explained on the anatomy and behavior of economies, especially in developing economies. Though we are stuck with the agendas and projects of sustainable development propagated by the multilateral institutions, developing countries like us are yet to realize economically, socially and environmentally sustainable systems for developing economies. Therefore much research is left to be done in this area.

I hope this conference will provide an opportunity for scholars and development practitioners to engage in very meaningful dialogues and generate new knowledge that is useful for the advancement of humanity. I wish the conference to be a pleasant memory for everybody.

Professor O.G. Dayaratna-Banda
Dean, Faculty of Arts
University of Peradeniya
Sri Lanka

MESSAGE FROM THE DEAN

Faculty of Economic Sciences and Business Administration, Transilvania University of Brasov

As the Dean of the Faculty of Economic Sciences and Business Administration, Transilvania University of Brasov, it is a great pleasure for me to send a message with the occasion of the 7th Peradeniya International Economics Research Symposium (PIERS) – 2019 with the theme: *"Nothing to be Left Behind: Integrating Sub-national Dynamics Towards Global Sustainable Development"*.

Last year, in November, we participated with a numerous delegation from the Faculty of Economic Sciences and Business Administration of Transilvania University of Brasov, at the PIERS 2018 conference. With this occasion, we met wonderful colleagues from Sri Lanka, India, Pakistan, USA and other countries, with whom we became friends with.

Also, we were extremely impressed by the way you organized PIERS 2018, by the professionalism and the friendliness of your colleagues from the University of Peradeniya (Faculty of Arts, International Research Center, Postgraduate Institute of Social Sciences and Humanities, Department of Economics and Statistics).

I am convinced that through our participation this year, as Joint Organizers, we will contribute to the strong development of the current partnership between our universities and faculties.

I wish good luck to the PIERS 2019 conference!

Professor Gabriel Brătucu
Dean of the Faculty of Economic Sciences and Business Administration
Transilvania University of Brasov
Romania

MESSAGE FROM THE DEAN

Faculty of Economics, South Asian University

The need of the hour is to undertake joint innovation so that the common requirements of the South Asian economies can be addressed. Innovation is a costly affair which cannot be undertaken by the individual countries. The scarce resources will have to be directed for developmental purposes. Hence, experimentation possibilities are limited. But the joint efforts can help productivity growth and employment growth both to pick up through technological progress, efficient utilization of the technology and skill development. We must also realise that ICT development is an integral part of technological progress. Hence, the joint innovation ventures in these areas are to be initiated aggressively by these countries.

Professor Arup Mitra
Dean – Faculty of Economics
South Asian University
India

MESSAGE FROM THE HEAD

Department of Economics and Statistics
University of Peradeniya

I am indeed honored to send this message of congratulations and appreciation for the 7th Peradeniya International Economic Research Symposium (PIERS 2018). The Department of Economics & Statistics is the pioneer institution in economic education and research established in 1942 and successfully conducted six annual economic research conferences since in 2013. The 7th PIERS is planned to be held on 17th & 18th October 2019 under theme of *"Nothing to be Left Behind: Integrating Sub-national Dynamics Towards Global Sustainable Development"* with the support of Inclusive and Sustainable Development within Globalized Economy. The Faculty of Economic Sciences and Business Administration, Transilvania University of Brasov, Romania; South Asian Economic Policy Network-World Bank, USA and Faculty of Economics of South Asian University, India which mainly focus the South Asian Economic Development within the Global context.

The quality of higher education provided by universities influence by the contribution of knowledge enhanced through research. Therefore, promoting the research-teaching nexus of the university education system with the participation of local and foreign experts; academics, researchers and policy makers are expected to result better outcomes among university students and academics. The 7th PIERS is expected to provide wider opportunities for interactions among local and foreign academics, researchers, policy makers, public officials and postgraduate and undergraduate students in sharping their knowledge and research experiences. I hope that this year PIERS too generates new knowledge in economics through research presentation that will contribute to global sustainable development through integrating the economic dynamics of sub-national economy of Sri Lanka as well as other countries.

While I congratulate the foreign delegates from various countries, presenters and the organizing committee, I wish for the PIERS 2019 all success.

Professor S. Vijesandiran
Head, Department of Economics and Statistics
Faculty of Arts, University of Peradeniya, Sri Lanka

MESSAGE FROM THE CHAIRPERSON

Department of Economics and Statistics
University of Peradeniya

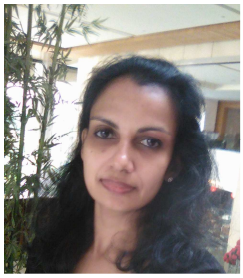
I am pleased to forward this message on the occasion where the Department of Economics and Statistics of the University of Peradeniya holds its 7th Peradeniya International Economics Research Symposium (PIERS 2019) on 17th and 18th October, 2019. The PIERS 2019 is organized with the partnership of the Faculty of Economic Sciences and Business Administration, Transilvania University of Brasov, Romania, South Asia Economic Policy Network of the World Bank and the Faculty of Economics, South Asian University, India.

The Peradeniya International Economics Research Symposium aims at providing a platform for exploring the results of economic research undertaken by research students and senior researchers attached to national and international universities and research centers/institutes. The symposium also provides opportunities for researchers from other disciplines to present their research findings on issues related to broad areas on growth, sustainable development, equity, environment, resource utilization, governance, development finance, other social political and cultural issues of development and social progress.

The academic dialogue of the PIERS 2019 is arranged around the theme of "*Nothing to be Left Behind: Integrating Sub-national Dynamics Towards Global Sustainable Development*" with panel discussions and technical sessions on related themes. The panel discussions and technical sessions will be facilitated by a number of eminent local and foreign scholars and researchers. The symposium therefore will provide an inspiring experience for young and emerging researchers to engage in a productive and flourishing dialogue on their research work and finding. The Editorial Committee of the PIERS 2019 have accepted a total of 37 papers following an extensive peer review process, and the papers will be presented in parallel sessions under 12 different technical sessions.

I use this opportunity to thank all individuals whose valuable contributions made PIERS 2019 successful. While warmly welcoming all of you to PIERS 2019, I hope that you will engage in a fruitful discussion on problems and issues that our communities and economies are encountered and entangled at present.

Professor J. M. Ananda Jayawickrama
Chairperson, PIERS 2019



MESSAGE FROM THE COORDINATOR

Department of Economics and Statistics
University of Peradeniya

The Peradeniya International Economics Research Symposium is organized annually by the Department of Economics and Statistics at the University of Peradeniya continued uninterrupted for seven years. This year PIERS is jointly organized by the Department of Economics and Statistics, University of Peradeniya, Sri Lanka and the Faculty of Economic Sciences and Business Administration, Transilvania University of Brasov, Romania in collaboration with South Asia Economic Policy Network (SAEPN), World Bank and South Asian University of India.

On behalf of the organizing committee I take this opportunity to extend my sincere thanks to the Vice-Chancellor, the Deputy Vice-Chancellor and the Dean- Faculty of Arts of the University of Peradeniya; Dean-Faculty of Economic Sciences and Business Administration, Transilvania University of Brasov, Romania for extending their fullest support and guidance for this event. I thank to Dr. Robet C.M. Bayer, Economist, South Asia Economic Policy Network (SAEPN) who helped us to get the financial support from World Bank. My special thanks goes to the Keynote Speaker Professor Arup Mitra, Dean, Faculty of Economics, South Asian University, India for kindly accepting our invitation to deliver the Keynote speech in the Symposium. I thank Prof. Ileana Tache, Director, Reserch and Development Institute, Transilvania University of Brasov, Romania for kindly accepting our invitation to participate as a Guests of Honor at the Symposium. My special thanks also goes to Prof. A.S.P. Abhayarathna, Dr. Suresh De Mel, Prof. Gheorghita Dinca, and Prof. Debdatta Saha for accepting our invitation to participate in the first panel presentation. I would like to extend my special thanks to Prof. Delini Gunawardena, Mrs. S. Rajendran, Prof. Ramya Vijaya, Dr. Samanmala Dorabawila, Ms. M. Panditharathna and Ms. C. Madadeniya for accepting our invitation to participate for the second panel presentation and Prof. Marius Sorin Dinca and Prof. O.G. Dayarathyna Banda for accepting our invitation to participate as invited speeches.

I would also like to express my sincere thanks to Prof. J. M. A. Jayawickrama, Chairperson of PIERS 2019. I would like to thank the Head, Department of

Economics and Statistics, University of Peradeniya for the help and cooperation extended to me to organize this event. I am truly grateful to the Chief editor and members of the editorial committee, reviewers, chairpersons, and discussants of this Symposium. I also express my gratitude to all my colleagues, junior academic staff and non-academic staff in the department for their support towards the event. My thanks also goes to Ms. Varangana Ratwatte, Ms. Chethini Madadeniya and Ms. Niluka Godagampala for helping with the secretarial work. I extend my sincere thanks to authors and presenters without whom this event would not take place. I thank the Assistant Registrar and the Senior Assistant Bursar of the Faculty of Arts for their cooperation extended to me. The Director of the PGIHS gave his fullest support to this event by providing the Symposium venue as well as his staff. I thank all of them for their whole-hearted cooperation.

I would like to express my appreciation to the sponsors of the PIERS- 2019 which mainly consist of Transilvania University of Brasov, Romania; South Asia Economic Policy Network (SAEPN), World Bank; Peradeniya University Reserch Grant; Event Grant-International Affair Office, University of Peradeniya; Postgraduate Institute of Humanities and Social Sciences (PGIHS), Open Society Foundations and the Center for Distance and Continuing Education (CDCE), University of Peradeniya.

While extending my sincere thanks to all who devoted their time to bring this 7th Peradeniya Economics Research Symposium to a reality today, I welcome the National and International Research Community, Industry, International Organizations and Governments' Representatives to discuss how we can integrate sub-national dynamics towards sustainable development in any region in the world.

I wish everyone a fruitful time!

Dr. K. M. R. Karunarathna
Coordinator, PIERS - 2019
Department of Economics and Statistics
University of Peradeniya
Sri Lanka

7th Peradeniya International Economics Research Symposium
PIERS – 2019

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Head, Department of Economics and Statistics, University of Peradeniya, Sri Lanka

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7th Peradeniya International Economics Research Symposium
PIERS – 2019

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Dr. M. D. R. K. Jayathilaka

PROGRAMME AGENDA

PIERS - 2019

Inauguration

Date: 17th October, 2019

Venue: Conference Hall, PGIHS

01.30 p.m.	*Registration of Participants*
02.00 p.m.	*Arrival of the Chief Guest*
02.05 p.m.	*Lighting of the Oil Lamp*
02.10 p.m.	*Welcome Address by **Prof. J. M. A. Jayawickrama***
	Chair, PIERS 2019
02.15 p.m.	*Opening Remarks by **Prof. S. Vijesandiran***
	Head, Department of Economic and Statistics, University of Peradeniya
02.20 p.m.	*Address by **Prof. O. G. Dayaratna Banda***
	Dean, Faculty of Arts, University of Peradeniya
02.25p.m.	*Address by **Prof. Ileana Tache***
	Director, Center for Economic Research, Research and Development Institute,
	Transilvania University of Brasov, Romania
02.35 p.m.	*Address by **Prof. S. H. P. Parakrama Karunarathne***
	Deputy Vice Chancellor, University of Peradeniya, Sri Lanka
02.45 p.m.	*Highlights and Releasing of the Proceedings of PIERS – 2019*
03.00 p.m.	*Address by Chief Guest **Prof. Upul B. Dissanayake***
	Vice Chancellor, University of Peradeniya, Sri Lanka
03.10 p.m.	*Keynote Address by **Prof. Arup Mitra***
	Dean, Faculty of Economics, South Asian University, India
03.30 p.m.	*Vote of Thanks by **Dr. Muditha Karunarathna***
	Coordinator, PIERS - 2019
03.35 p.m.	*Refreshments*

17th OCTOBER, 2019
PANEL PRESENTATION – I

Chairperson: ***Prof. Anoma Abhayaratne***
Department of Economics and Statistics, Faculty of Arts,
University of Peradeniya, Sri Lanka

04.00 p.m. Opening remarks by Chairperson

04.10 p.m. Presentations:

Dr. S.J.S. de Mel
Department of Economics and Statistics,
University of Peradeniya, Sri Lanka

Prof. Gheorghita Dinca
Faculty of Economic Sciences & Business Administration,
Transilvania University of Brasov, Romania

Prof. Debdatta Saha
Faculty of Economics,
South Asian University, India

05.10 p.m. *Discussion*

05.30 p.m. *Wrap up by the Chair*

05.45 p.m. *End of 1st Day Events*

18th OCTOBER, 2019
PANEL PRESENTATION - II

Theme: "Leaving No One Behind - Using a Gender Economics Lens to Address SDG5"

Chairperson: ***Ms. S. Rajendran***
Department of Economics and Statistics, Faculty of Arts,
University of Peradeniya, Sri Lanka

08.45 a.m. - 08.50 a.m. Opening remarks by Chairperson

08.50 a.m. - 09.45 a.m. Presentations:

Prof. Ramya Vijaya, *Stockton University, New Jersey, USA*

Prof. Dileni Gunawardena, *Department of Economics and Statistics, University of Peradeniya, Sri Lanka*

Dr. Samanmala Dorabawila, *Department of Economics and Statistics, University of Peradeniya, Sri Lanka*

Ms. M.Panditharathna *and* ***Ms. C. Madadeniya,*** *Department of Economics and Statistics, University of Peradeniya, Sri Lanka*

09.45 a.m. -10.00 a.m. Discussion

10.00 a.m. Refreshments

18th OCTOBER, 2019

TECHNICAL SESSIONS: SESSION SUMMARY

10.30 a.m. **Technical Sessions I – IV**

Session I	- Theme :	Investment and Economic Growth
Session II	- Theme :	Poverty, Agriculture and Environment
Session III	- Theme :	Human Capital and Labor
Session IV	- Theme :	Sub-national Dynamics and Development

11.50 a.m. **Technical Sessions V – VIII**

Session V	- Theme :	International Trade and Finance
Session VI	- Theme :	Natural Resources and Environmental Management
Session VII	- Theme :	Education and Human Capital
Session VIII	- Theme :	Finance and Corporate Management

01.10 p.m. *Lunch*

02.00 p.m. **Technical Sessions IX – XII**

Session IX	- Theme :	Public Finance and Fiscal Policy
Session X	- Theme :	Agriculture and Farm Efficiency
Session XI	- Theme :	Health and Human Capital
Session XII	- Theme :	Gender, Social Inclusiveness and Human Protection

Technical Session I: Investment and Economic Growth

Time: 10.30 a.m. – 11.50 a.m.

Venue: Room No. 105, Ground Floor, PGIHS

Chairperson: Prof. M. B. Ranathilaka
Department of Economics and Statistics, Faculty of Arts,
University of Peradeniya, Sri Lanka

Discussant: Dr. T. Vinayagathasan
Department of Economics and Statistics, Faculty of Arts,
University of Peradeniya, Sri Lanka

10.30 a.m. – 10.35 a.m. Opening Remarks by Chairperson

10.35 a.m. – 11.30 a.m. Presentations:

1. Causal Links between Trade Openness and Foreign Direct Investment: The Long-run and Short-run Analysis of Sri Lanka
   R. M. M. Mayoshi *and T. N. Vidanage*
2. The Effect of Macroeconomic Determinants on Capital Flight in Sri Lanka
   G. D. N. M. Godagampala *and S. Vijesandiran*
3. Impact of Governance Indicators on Net FDI Inflows: Empirical Evidence from Sri Lanka
   K.K.T. Udayanga

11.30 a.m. – 11.45 a.m. Remarks by the Discussant

11.45 a.m. – 11.50 a.m. Closing Remarks by the Chairperson

Technical Session II: Poverty, Agriculture and Environment

Time: 10.30 a.m. – 11.50 a.m.
Venue: Room No. 106, Ground Floor, PGIHS

Chairperson: Dr. J. Nigel
Department of Economics and Statistics, Faculty of Arts,
University of Peradeniya, Sri Lanka

Discussant: Dr. P. S. K. Rajapakse
Department of Environmental Management,
Faculty of Social Sciences and Humanities, Rajarata University of Sri Lanka.

10.30 a.m. – 10.35 a.m. Opening Remarks by Chairperson

10.35 a.m. – 11.30 a.m. Presentations:

1. The Effects of Natural Disasters: A Study to Sustain Paddy and other Seasonal Crop Farmers in Sri Lanka
   K. A. D. L. Lakpriya, *R. D. N. L. Deshapriya, P. M. D. G. T. Pathiraja, P. G. N. A. H. Wijesiri, and M. D. R. K. Jayathilaka*
2. Recreational Activities and their Impact on Poverty in Sri Lanka
   L. G. S. H. M. Karunarathne, R. M. H.T. Rathnayaka*, B. G. D. U. I. Gamage, G. P. D. P. G. Geethanjana, and M. D. R. K. Jayathilaka*
3. Green Accounting and Sustainability Practices in Sri Lankan Garment Industry
   P. A. D. S. Himasha, S. A. T. Senadheera, *N. Serasinghe, K. A. G. K. Karunanayke and H. W. M. Weligodapola*

11.30 a.m. – 11.45 a.m. Remarks by the Discussant

11.45 a.m. – 11.50 a.m. Closing Remarks by the Chairperson

Technical Session III: Human Capital and Labor

Time: 10.30 a.m. – 11.50 a.m.
Venue: Room No. 207, First Floor, PGIHS
Chairperson: Prof. A.S.P.Abhayaratne
Department of Economics and Statistics, Faculty of Arts,
University of Peradeniya, Sri Lanka
Discussant: Dr. T. N. Vidanage
Department of Economics and Statistics, Faculty of Arts,
University of Peradeniya, Sri Lanka

10.30 a.m. – 10.35 a.m. Opening Remarks by Chairperson

10.35 a.m. – 11.30 a.m. Presentations:

1. Loss of Manpower due to Road Traffic Congestion in Kandy City: A Comparison between Different Vehicle Users
   *M. Karunarathna**,** , Y. M. Bandara,* ***W. Athukorala*** *and R. Gangahagedara*
2. Explore Employer Expectations in the Software Development Industry in Sri Lanka
   A. S. K. Bulathsinghala, *A. Jayakody, , L. G. C. S. Lihinigama,*
   K. H. A. Anurad and D. M. K. N. Karunarathna
3. Does Human Capital Matter for Economic Growth in Sri Lanka? An Analysis Using Employment-based Human Capital Indicators
   K. A. N. I. Kariyapperuma, *C. R. Abayasekara and M. G. C. N. Madadeniya*

11.30 a.m. – 11.45 a.m. Remarks by the Discussant

11.45 a.m. – 11.50 a.m. Closing Remarks by the Chairperson

Technical Session IV: Sub-national Dynamics and Development

Time: 10.30 a.m. – 11.50 a.m.
Venue: Room No. 208, First Floor, PGIHS
Chairperson: Dr. M. Ganeshamoorthy
Department of Economics ,Faculty of Arts, University of Colombo
Discussant: Dr. A. Aruna Shantha
Department of Economics & Statistics, Faculty of Social Sciences and Languages,
Sabaragamuwa University of Sri Lanka

10.30 a.m. – 10.35 a.m. Opening Remarks by Chairperson

10.35 a.m. – 11.30 a.m. Presentations:

1. Determinants of Regional Development Disparities in Sri Lanka: An Empirical Investigation into Development Trends and Issues
   H. R. A. C. Thilanka *and J. G. Sri Ranjith*
2. An Analysis of Household Demand for Major Food Items in Urban, Rural and Estate Sectors of Sri Lanka
   N. J. C. Paraneetharan, *J. Nigel and T.Vinayagathasan*
3. The Dynamic Linkages between Economic Growth and Sectoral Growth: Empirical Evidence from Sri Lanka
   A. Pusparasa *and T. Sukirtha*

11.30 a.m. – 11.45 a.m. Remarks by the Discussant

11.45 a.m. – 11.50 a.m. Closing Remarks by the Chairperson

Technical Session V: International Trade and Finance

Time: 11.50 a.m. – 01.10 p.m.

Venue: Room No. 105, Ground Floor, PGIHS

Chairperson: Dr. Dayarathna Silva
EU- Sri Lanka Trade Related Assistance Project Office,
International Trade Centre, Sri Lanka

Discussant: Prof. Gheorghita Dinca
Faculty of Economic Sciences & Business Administration,
Transilvania University of Brasov, Romania

11.50 a.m. – 11.55 a.m. Opening Remarks by Chairperson

11.55 a.m. – 12.50 p.m. Presentations:

1. Export Led Growth Hypothesis in the Context of Sri Lanka
   K. Werawella
2. International Migration Flows in South Asia: A Cross-sectional Analysis
   D. N. Ranawaka
3. The Financial Intermediation and Economic Growth: Evidence from Sri Lanka
   S. Mathusha *and K. Gnaneswaran*

12.50 p.m. – 01.05 p.m. Remarks by the Discussant

01.05 p.m. – 01.10 p.m. Closing Remarks by the Chairperson

Technical Session VI: Natural Resources and Environmental Management

Time: 11.50 a.m. – 01.10 p.m.

Venue : Room No. 106, Ground Floor, PGIHS

Chairperson: Prof. J. Weerahewa
Department of Agricultural Economics and Business Management,
Faculty of Agriculture, University of Peradeniya, Sri Lanka

Discussant : Prof. P. P. A. W. Athukorala
Department of Economics and Statistics, Faculty of Arts, University of Peradeniya, Sri Lanka

11.50 a.m. – 11.55 a.m. Opening Remarks by Chairperson

11.55 a.m. – 12.50 p.m. Presentations:

1. The Socio-economic Consequences of Post-consumed Polythene: The Case of Western and Uva Province
   A. Shantha
2. Impact of Socio-economic Factors on Solid Waste Management in Matale Municipal Council Area
   K. Kumudhini *and A. S. P. Abhayaratne*
3. Evaluation of Required Contribution by Residents and other Entities for Solid Waste Collection: A Study in Kandy Municipal Area
   R. M. S. N. Rathnayake *and M. Bandara*

12.50 p.m. – 01.05 p.m. Remarks by the Discussant

01.05 a.m. – 01.10 p.m. Closing Remarks by the Chairperson

Technical Session VII: Education and Human Capital

Time: 11.50 a.m. – 01.10 p.m.
Venue: Room No. 207, First Floor, PGIHS

Chairperson: Prof. H. M. W. A. Herath
Department of Economics and Statistics, Faculty of Arts, University of Peradeniya, Sri Lanka
Discussant: Prof. Debdatta Saha
Faculty of Economics, South Asian University, India.

11.50 a.m. – 11.55 a.m. Opening Remarks by Chairperson

11.55 a.m. – 12.50 p.m. Presentations:

1. The Education Component of Human Capital: Explorations with an Indicator for Sri Lanka
   C. R. Abayasekara *and* ***M. G. C. N. Madadeniya***
2. Public Education Versus Private Tutoring in Sri Lanka: Who is Contributing More?
   T. N. Herath
3. The Impact of Procrastination, Self-efficacy, and Motivation on Academic Performance of Undergraduates in Sri Lanka
   K. C. Sandaruwan, R. H. S. Prabodhya and ***R. P. S. Amarasooriya***

12.50 p.m. – 01.05 p.m. Remarks by the Discussant

01.05 p.m. – 01.10 p.m. Closing Remarks by the Chairperson

Technical Session VIII: Finance and Corporate Management

Time: 11.50 a.m. – 01.10 p.m.
Venue: Room No. 208, First Floor, PGIHS

Chairperson: Prof. Ileana Tache
Center for Economic Research, Research and Development Institute, Transilvania University of Brasov, Romania
Discussant: Dr. M. D. R. K. Jayathilaka
Faculty of Business, Sri Lanka Institute of Information Technology

11.50 a.m. – 11.55 a.m. Opening Remarks by Chairperson

11.55 a.m. – 12.50 p.m. Presentations:

1. Impact of Bank Size on Bank Profitability: Using Four Licensed Commercial Banks in Sri Lanka
   W. M. T. Jayamali *and S. J. S. De Mel*
2. Impact of Board Diversity on Firms' Economic Sustainability in Sri Lanka
   A. D. K. P Madushani, H. D. R. M. Mel*, H. M. C. K Herath, W.M.B.K Weerasooriya and M.M.D. de S Gunawardena*
3. Corporate Social Responsibility and Financial Performance in Tourism Industry
   D. R. M. Weerasinghe, G. P. T. D. Pathirana, ***S. Kaneshwaren****, C. M. Rajapaksha, L. M. H. De Silva, R. A. K. R. Perera and N. Nagendrakumar*

12.50 p.m. – 01.05 p.m. Remarks by the Discussant

01.05 p.m. – 01.10 p.m. Closing Remarks by the Chairperson

Technical Session IX: Public Finance and Fiscal Policy

Time: 02.00 p.m. – 03.35 p.m.
Venue: Room No. 105, Ground Floor, PGIHS

Chairperson: Dr. J. G. Sri Ranjith
Department of Economics and Statistics, Faculty of Arts, University of Peradeniya, Sri Lanka

Discussant: Dr. N. Keembiyahetti
Department of Economics, Faculty of Humanities & Social Sciences, University of Ruhuna, Sri Lanka

02.00 p.m. – 02.05 p.m. Opening Remarks by Chairperson

02.05 p.m. – 03.20 p.m. Presentations:

1. Measuring the Impact of Special or Concessionary Tax Rate Policies on Corporate Income Tax Revenue of Sri Lanka
   K. K. S. Hettiarachchi *and J. M. A. Jayawickrama*
2. Examining the Inter-temporal Dynamic Relationship between Inflation and Volatility of Inflation: Evidence from Sri Lanka
   P. Shobini *and S. Sivarajasingham*
3. The Impact of Government Debt on Economic Growth in Sri Lanka
   A. S. G. S. Bandara

03.20 p.m. – 03.30 p.m. Remarks by the Discussant

03.30 p.m. – 03.35 p.m. Closing Remarks by the Chairperson

Technical Session X: Agriculture and Farm Efficiency

Time: 02.00 p.m. – 03.35 p.m.
Venue: Room No. 106, Ground Floor, PGIHS

Chairperson: Prof. N. D. Samarawickrama
Department of Economics and Statistics, Faculty of Arts, University of Peradeniya, Sri Lanka

Discussant: Prof. Marius Sorin Dinca
Faculty of Economic Sciences & Business Administration, Transilvania University of Brasov, Romania

02.00 p.m. – 02.05 p.m. Opening Remarks by Chairperson

02.05 p.m. – 03.20 p.m. Presentations:

1. Technical Efficiency and Its Determinants of Small – holder Rubber Farmers in Kalutara: Stochastic Frontier Analysis
   N. N. S. De Costa *and* ***A. Thayaparan***
2. Cost of the Fertilizer Subsidy for Paddy Farmers: An Empirical Investigation in Sri Lanka
   H. K. A. P. Hatharasinghe, D. N. T. Jayamanne *and W. Athukorala*
3. An Evaluation of Crop Damage Done by Wild Animals in Meegahahena Grama Niladari Division
   P. A. S. K. K. Kahapola

03.20 p.m. – 03.30 p.m. Remarks by the Discussant

03.30 p.m. – 03.35 p.m. Closing Remarks by the Chairperson

Technical Session XI: Health and Human Capital

Time: 02.00 p.m. – 03.35 p.m.
Venue: Room No. 207, First Floor, PGIHS

Chairperson: Dr. C. R. Abayasekara
Department of Economics and Statistics, Faculty of Arts, University of Peradeniya, Sri Lanka
Discussant: Dr. S. S. K. B. M. Dorabawila
Department of Economics and Statistics, Faculty of Arts, University of Peradeniya, Sri Lanka

02.00 p.m. – 02.05 p.m. Opening Remarks by Chairperson

02.05 p.m. – 03.20 p.m. Presentations:

1. The Impacts of Fiscal Decentralization on Health Outcomes in Bangladesh
   M. Murshed
2. Chronic Kidney Disease of Unknown Aetiology: A Review of Literature on the Socio-economic Aspects
   V. Ratwatte*, W. Athukorala, S. Y. Bandara and R. Gangahagedara*
3. Status of Health Sector Reforms in Khyber Pakhtunkhwa (KPK): A Post-devolution Analysis
   M. A. Abbasi *and I. Ahmad*

03.20 p.m. – 03.30 p.m. Remarks by the Discussant

03.30 p.m. – 03.35 p.m. Closing Remarks by the Chairperson

Technical Session XII: Gender, Social Inclusiveness and Human Protection

Time: 02.00 p.m. – 03.35 p.m.
Venue: Room No. 208, First Floor, PGIHS

Chairperson: Prof. Ramya Vijaya
Stockton University, New Jersey, USA
Discussant: Ms. A.V. K. Madhavie
Department of Economics and Statistics, Faculty of Arts, University of Peradeniya, Sri Lanka

02.00 p.m. – 02.05 p.m. Opening Remarks by Chairperson

02.05 p.m. – 03.20 p.m. Presentations:

1. Integrating Women in the Clean Energy Supply Chain: Identifying Patterns and Barriers to Their Inclusion Using Case Studies of Clean Energy Projects in India
   P. Chauhan
2. Challenges of Social Inclusion of the Visually Impaired and Blind Persons in the Sri Lankan Workplace
   T. Suraweera and ***V. R. Dunuwila***
3. The Impact of the Propotion of Female Directors on Firm Performance: An Approach to Achieve Gender Equality
   A. C. H. F. Zainab, H. D. N. N. Senavirathna, *M. D. R. K. Jayathilaka, W. M. S. Priyashantha, and T. A. D. K. Yasarathna*
4. Stimulating Factors of Social Inclusion of Children with Visual Impairment and Blindness in Sri Lanka
   T. Suraweera, ***W. A. T. S. Perera****, D. P. B. P. M. Dharmasiri, H. A. N. M. Rukmal and V. A. H. Senaviratne*

03.20 p.m. – 03.30 p.m. Remarks by the Discussant

03.30 p.m. – 03.35 p.m. Closing Remarks by the Chairperson

CLOSING SESSION

Time: 03.35 p.m. – 5.15 p.m.
Venue: Conference Hall, 2nd Floor, PGIHS

Chairperson: Prof. J. M. A. Jayawickrama
Chair, PIERS - 2019
Department of Economics and Statistics, Faculty of Arts,
University of Peradeniya, Sri Lanka

03.35 p.m.	Opening remarks by Chairperson
03.40 p.m.	Invited Speeches:
	Prof. Marius Sorin Dinca
	Faculty of Economic Sciences & Business Administration,
	Transilvania University of Brasov, Romania
	Prof. O. G. Dayarathna Banda
	Dean, Faculty of Arts,
	University of Peradeniya, Sri Lanka
04.15 p.m.	Awarding of Certificates
04.25 p.m.	Concluding Remarks & Evaluation
04.35 p.m.	Vote of Thanks: ***Prof. S. Vijesandiran***
	Advisor, PIERS – 2019
04.45 p.m.	Refreshments
05.15 p.m.	End of Symposium

KEYNOTE ADDRESS

Joint Efforts for Innovation and Employment-Intensive Growth

Prof. Arup Mitra

Dean, Faculty of Economics, South Asian University, India

1. Future Threats to Growth in the absence of Productive Employment

Particularly in regions which lack opportunities for progress the educated unemployed youth tend to participate in unproductive activities, leading to insurgency and social unrest. Subsequently it is observed that they exert a strong influence on the local residents who are less educated, motivating them to revolt against the establishment. Since such an approach is usually destructive in nature any attempt to initiate developmental programmes in these regions then fails miserably. It also leads to eruptions of frequent violence, resulting in loss of life and resources. The disturbed atmosphere is then a disincentive to attract new investment into these regions. The lack of adequate infrastructure in any case reduces investment flow. On top of that violence works as a major retarding force. Much of the scare resources then get diverted to controlling crimes instead of being spent on developmental programmes. Even if the revolution would have a genuine concern in the beginning, often it is observed that any extreme approach leads to a chaotic situation. Crime and poor governance are the major causes of sluggish flow of FDI and domestic investment both. On the other hand, government investment receives major oppositions from the local residents and thus remains unsuccessful. All this leads to a vicious circle of less development, lack of opportunities improving the living conditions and low levels of productivity.

The Indian manufacturing sector represents very large units and small units, characterized by a 'missing middle'. If due to inequality it is not possible to nurture the entrepreneurial ability of the middle class, new pathways to enhancing growth cannot be explored, and the new methods for productivity improvement cannot not be evolved. The representation of the middle class in the industrial sector as entrepreneurs is rather limited particularly due to the lack of investible resources in their hands. As Mazumdar (undated) writes,

India's manufacturing sector is characterized by a dualistic nature – with the two strong modes of very small-sized firms (fewer than ten workers) and very large firms (500 or more workers). Though labour laws are usually held responsible for such dualistic development, the other factors connected with inadequate education, infrastructure and industrial policies are equally important. The resultant concentration of employment growth in the large informal sector has prompted certain efforts for extending benefits to workers in this sector as well as to the formal sector of the labour market though these programmes have still not been implemented adequately (Mazumdar, 2010).

In a number of sectors corruption is on the rise, which is the main cause of growing inequality. Though there is literature in defense of corruption, i.e., 'grease the wheel', the benefits rendered to the bribing party is always at the cost of the other competitors. Hence, corruption cannot lead to a situation of pareto optimality. It rather results in loss of output and productivity in the long run at the aggregate level notwithstanding individual gains. Of course if the individual gainers happen to be the giant firms the overall industry may show a positive growth. However, if an aggregate picture is drawn relating to the potential loss of public revenue and its utilization towards infrastructure and human capital formation the magnitude of loss, particularly in meeting the pro-poor growth objectives are substantial. Usually in the literature we focus on the effect of growth on poverty and do not consider the reverse causality and the quantum of loss in growth due to high levels of poverty. Higher poverty means lower levels of productivity and less growth in the long run. Besides, with less purchasing power in the hands of a large section of the population there is less demand for goods and services including those which are produced in the informal sector. After all production of these goods involves labour intensive methods which in turn provide sources of livelihood to many.

On the other hand, in an economy with low levels of incomes the demand for high quality goods and services is highly limited. The entrepreneurs do not have incentives to innovate and improve the production methods which will involve substantial gains in terms of total factor productivity growth and without productivity gains meaning higher returns in relation to input utilization, resources cannot be generated for developmental programmes which are prerequisites for sustainable growth and development. Without

requisite innovation and improvement in the quality of the products the export potentiality of the economy cannot be tapped and thus the demand may slide down in the long run. This is likely to result in loss in growth and employment of particularly those who are more vulnerable due to inadequacy of skill. With rising inequality and poverty people tend to substitute nutritious food by other cheap products which affect productivity adversely. Their ability to incur expenditure on both protective and curative health care remains poor, resulting in declining contribution of labour in the process of growth. In the face of all this, greater capital intensive methods of production will aggravate the 'employment problem' further and hence, greater care will have to be taken to address the dual objectives of growth and employment creation. If the import of technology and the current patterns of innovation to develop appropriate technology are not adequate to augment employment, newer paths will have to be explored particularly in the wake of the new industrial revolution which is expected to be much more capital intensive in the coming years. Much greater attention will have to be paid to skill formation and training aspects so that the quality of labour in India emerges to conform to the international standards and the future investments.

2. Fourth Industrial Revolution and Employment Challenges

Unlike the first and the second industrial revolution which used water and steam power and electric power respectively to create production the third industrial revolution used electronics and information technology to automate production. The fourth industrial revolution while building on the third, introduces the digital revolution and is characterized by a fusion of technologies, blurring the lines between the physical, digital, and biological spheres[1]. In the backdrop of this new revolution the worry is whether the phenomenon of jobless growth will become a prevalent phenomenon, especially in developing countries confronted with excess supplies of labour in relation to demand. The technology which is manufactured in the western countries has been highly capital intensive and skill intensive as observed since the third industrial revolution. This suited the labour market conditions of the developed world where with sluggish population growth labour supply

[1] https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

growth decelerated considerably. Further, with higher educational attainments the labour market of the developed countries witnessed an almost disappearance of unskilled labour.

The import of capital and skill intensive technology from the developed to the developing world results in sluggish employment growth though UNIDO (2005) urged that such technology mobility should be facilitated by other means of reforms on the macro front. Globalisation and the economic reforms pursued by most of the countries at the behest of World Bank-IMF initiation did witness a sharp decline in the effective rate of protection and domestic resource cost and other trade barriers all of which encouraged import of technology. The adoption and adaptation of these international technologies are indeed costly because of tacit knowledge and circumstantial sensitivity of technology (Evenson and Westphal 1995). Unless an importing country has significant technological capability, it cannot fully utilize the imported technology**.** Besides, imported technology may require more skilled than unskilled workers while developing countries are usually have an abundant supply of the latter type. Acemoglu and Zilibotti (2001) argued that due to the difference in skill scarcity, technology in developed countries tends to be skill intensive and is inappropriate for developing countries. Though UNIDO (2005) argues that it is still cheaper for a latecomer to buy the technology already invented by others than to re-invent the wheel, there can be serious implications in terms of employment loss.

Thus, given the sluggish growth in labour demand in the formal component of the manufacturing sector there is a great deal of interest to vouch for domestic innovation which may prompt the production of suitable technology contributing to productivity and employment simultaneously. However, at the advent of the fourth industrial revolution which involves several countries in terms of technology sharing and technology spill-over domestic innovation is also expected to be highly labour displacing. If the new technology enhances productivity as well as promotes employment, the choice is clear. Such a possibility, though empirically difficult to materialize, exists at least theoretically. For example, technological progress brings in upward shift in the production frontier, which would mean higher levels of output for the given levels of inputs. In such a situation if the new technology becomes

labour intensive, the rise in value added and employment both will be witnessed. However, the value added growth will be more than the rise in employment, and hence, labour productivity can actually shoot up[2]. Conversely, the new technology can dampen employment and improve productivity by adopting capital-deepening process.

Choi, Yub and Jin (2002) analyzed the implications of Hicks-neutral technical progress for a small Harris-Todaro economy with variable returns to scale. The analysis demonstrates that the welfare effects of technical progress consist of three components, i.e., the primary growth effect, the returns-to-scale effect and the employment effect. This type of decomposition is indeed useful as it deciphers the effects of technical progress into various components. Besides, the study works out the possibilities under non-constant returns to scale which is a much stronger possibility in the real world than a constant returns to scale situation. Under constant returns to scale the possibility of poverty-aggravation may not exist and one may conclude that technical progress will be beneficial. But with the introduction of non-constant returns to scale, technical progress can lead to the returns-to-scale effect, which can be of any sign, and the sum of the primary growth effect and the employment effect again can be of any sign. In other words, growth without employment generation is possible as technical progress tends to reduce labour absorption.

Technical progress and rising capital intensity in the literature are almost synonymous. On the other hand, innovation in the line of labour intensive technical progress is a difficult proposition. The capital intensive technical change also has important implications for rates of industrialization and capital accumulation even when the economies, particularly in the developing world, are characterized by a dual economic structure. Kelley, Williamson and Cheetham (1972) noted that increases in the bias may tend to inhibit the rate of industrialization and reduce the rate of capital accumulation without appreciable changes in per capita GNP growth. Related to these results is the extent to which labour absorption in the industrial sector is affected. The study observed an important retarding influence that accumulates over time. It questions the wisdom of introducing labour saving technology in the industrial

[2] However, when output is fixed, the shift in technology from being capital intensive to labour intensive would result in deterioration in labour productivity.

sector in order to enhance per capita growth. The authors rather noted that per capita income is mostly insensitive to the technological bias introduced in the industrial sector of the developing countries. Hence, the outcome is neither an increase in per capital income nor a rise in employment in the industrial sector in response to adoption of capital intensive technology.

In fact, Mureithi (1974) elucidates this point with great lucidity. The rising capital-labour ratio means that each job creation becomes more capital-expensive. Of course it must not be supposed that rising capital intensity is bad per se as a large part of the capital formation could be devoted to the building of infrastructure like roads, public works, communications, etc. The "compensation theory" as Vivarelli (2011, 2013) points out, argues that technological unemployment is a temporary phenomenon. The labour saving effects of technology can be offset through: "(1) additional employment in the capital goods sector where new machines are being produced, (2) decreases in prices resulting from lower production costs on account of technological innovations, (3) new investments made using extra profits due to technological change, (4) decreases in wages resulting from price adjustment mechanisms and leading to higher levels of employment, (5) increases in income resulting from redistribution of gains from innovation, and (6) new products created using new technologies" (Vivarelli, 2013)[3]. However, Vivarelli (2014) concludes that the compensation mechanisms require strict assumptions, overlook the secondary adverse demand effects that may result from falling wages, and may not all work in tandem. Therefore…*economic theory does not have a clear-cut answer regarding the employment effect of innovation*. Hence, one should … *focus on aggregate, sectoral, and microeconomic empirical analyses that take into account the different forms of technical change* … the various compensation mechanisms and the possible hindrances they face.

A positive relationship between innovation and employment has been conceptualized in a novel way by Saviotti and Pyka (2004). Interpreting economic development as synonym for new goods, services or sectors they view it as a result of increasingly systematic use of innovation. It is quite natural that as the old product or services matures employability declines. Thus, to improve the level of employment in a continuous manner, innovation has to go on and new goods and services have to be produced. In this sense innovation and employment can go hand in hand. The ability to reap variety is a manifestation of economic development, which in turn can create

[3] Also see Vivarelli (1995) and Pianta (2005).

employment steadily. Also, on the productivity front its growth may not take place indefinitely implying upper bounds on sectoral productivity growth. In order to augment the productivity growth at the country level efforts have to be pursued to create new sectors. On the whole, the possibility of a positive relationship between innovation, employment and growth is very much comprehensible.

On the whole, R&D does not seem to enhance the performance index in a very significant manner across industry groups considered in the study. The lack of extensive evidence on impact of R&D on TFPG suggests that innovation does not necessarily result in technological progress. On the other hand, the positive impact of R&D on efficiency can be interpreted as the expenditure incurred to realize the potentiality of the technology which is possibly imported. For technological up-gradation the firms will continue to depend on imports from developed countries. Given the huge innovative activities pursued in the west the future technology which is likely to be adopted by most of the countries will be of western origin. And this will not suit the labour market conditions of the developing countries as most of the new technology will be highly capital and skill intensive (Mitra, 2010). Globalisation, reduction in mobilization cost of technology and the shifting of the production base from the developed world to the developing nations have already resulted in a rise in capital-labour ratio in most of the industry groups in India. Based on the data for the aggregate organized manufacturing from Annual Survey of Industries a decomposition of value added growth in terms of employment growth and productivity growth is carried out to delineate the contribution of labour to value added growth vis-à-vis the capital intensive technology (Table 5). Only a handful of industries are seen to have experienced a rapid productivity growth of at least 5 per cent per annum and employment growth of at least 4 per cent per annum simultaneously[4]. Though there is no huge trade-off (in terms of a negative correlation) between productivity growth and

[4] 173 (manufacture of knitted and crocheted fabrics), 182 (dressing and dyeing of fur etc), 232 (manufacture of refined petroleum products), 281(manufacture of structural metal products, tanks etc), 300 (manufacture of office, accounting and computing machinery), 312 (manufacture of electricity distribution and control apparatus), 319 (manufacture of other electrical equipment), 332 (manufacture of optical instruments etc), 372 (recycling of non-metal waste and scrap) and others.

employment growth across industries, the positive correlation across industries is highly negligible, i.e., 0.08. In other words, capital intensive technology has been adopted in several industries, leading to a rapid value added growth and labour productivity growth. This is also reflected in the growth in capital-labour ratio across various groups that witnessed a growth rate of more than 4 per cent per annum.

3. Joint efforts to mitigate these challenges

The overall 'employment problem' in the context of the developing countries can be conceptualized in terms of working poor. It cannot be gauged merely in terms of open unemployment rate because many cannot afford to remain unemployed for long. Hence, in the absence of a substantial demand for labour the excess supplies take respite in low productivity informal sector activities, which offer meager earnings. Given the sluggish employment growth in the high productivity activities in the Indian context, the concern for actualizing inclusive growth has been growing significantly. In this context which sector can play the lead role is an important question. Following the historical experience of the developing countries industry is the obvious choice. But the share of industry in total work force is only 12.5 per cent (in 2014-15, ILO, India Labour Market Update)[5] and in value added 17.8 per cent (in 2015-16 in 2011-12 prices, CSO)[6]. Further, the share of informal or unorganized component within this sector is very large. As far as the formal or organized manufacturing is concerned the labour intensive industries did not necessarily witness a rapid employment growth during the reform period (Mitra, 2013). The composition of the aggregate manufacturing shows that food, beverages etc. account for nearly 10 per cent, and textiles etc. and metal etc. 13 per cent each and machinery and equipment 20 per cent of the gross value added originating from this sector. Given these broad characterization it is worth examining if innovative pursuits of the firms are likely to reduce the employment growth further, aggravating the 'employment problem' of the economy.

[5] http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-new_delhi/documents/publication/wcms_496510.pdf

[6]http://www.mospi.gov.in/sites/default/files/reports_and_publication/statistical_publication/National_Accounts/NAS17/S1.6A.pdf

The need of the hour is to undertake joint innovation so that the common requirements of the South Asian economies can be addressed. Innovation is a costly affair which cannot be undertaken by the individual countries. The scarce resources will have to be directed for developmental purposes. Hence, experimentation possibilities are limited. But the joint efforts can help productivity growth and employment growth both through technological progress, efficient utilization of the technology and skill development. We must also realise that ICT development is an integral part of technological progress. Hence, the joint innovation ventures in these areas are to be initiated aggressively by these countries.

With limited industrialization the wave of tertiarization is on the rise. Whether it will be able to sustain the long run growth is an important question. And whether it will be appropriate to exhibit the inclusiveness aspect by creating productive employment opportunities is even more alarming given the excess supplies of labour we have. In what ways the low productivity employment in the agriculture sector and the urban informal sector can be transformed to raise the productivity and earnings of the workers needs to be investigated. These problems are common across countries because the supplies and demand conditions hold a great deal of commonality given the similarities in the socio-economic and cultural spheres. Hence, joint efforts will have to be initiated not only to make them cost effective but also there is no alternative left for us.

EXTENDED ABSTRACTS

Determinants of Regional Development Disparities in Sri Lanka: An Empirical Investigation into Development Trends and Issues

J. G. Sri Ranjith and H. R. A. C. Thilanka

Department of Economics and Statistics, University of Peradeniya
Sri Lanka

Keywords: *Capital and Recurrent Expenditure; Education Sector; Provincial Councils; Regional Disparity*

Introduction

Regional disparity is a highly discussed topic in regional development under spatially unbalanced economic development in terms of unequal resources or income distribution. According to the literature, regional disparities can be classified as social, economic and territorial disparities (Kutscherauer, 2010). Among these different classifications, economic disparity is particularly seen through regional output, employment or income which is quantitative, and with many other qualitative dimensions that are related to living standards of a regional community.

In the Sri Lankan context, the distribution of provincial per capita GDP over the last few decades reveals that inequality is considerably high. It shows that stark regional disparities remain between the Western Province and the other provinces with the former accounting for half of overall economic activity, leading by a wide margin of income share. Sri Lanka implemented the Provincial Council system in 1987 to provide greater autonomy to local governments to take necessary measures to increase the local share of the resources and thereby provincial GDP and employment. However, this measure does not seem to have addressed the main issues effectively. According to Waidyasekera (2005), the Provincial Council system has produced a Centre-biased economic system. Fiscal capacities of provinces are very unequal and there is a wide disparity between the different provincial administrations in terms of revenue performance and expenditure levels, and even in the allocation of grants.

Regional convergence and spatial distribution have gained vast interest among theoretical and empirical academic discourses (Antonescu, 2014). Rey and Montouri (2006) found strong patterns of both global and local spatial autocorrelation throughout their study period, and the magnitude of global spatial autocorrelation was also found to exhibit strong temporal co-movement with regional income dispersion. For Indonesia, Resosudarmo and Vidyattama (2006) observed that despite the existence of regional income disparity, there is conditional regional income per capita growth convergence. And saving of physical capital, trade openness and the contribution of the gas and oil sectors are the determinants of this provincial income per capita in Indonesia.

Although there are many descriptive research publications available regarding the Sri Lankan development disparities across regions, only a few studies focus on policy effectiveness and the significance of strategies implemented so far at sub-national level. This research gap is addressed in this study, and we explore the determinants of regional development disparities in Sri Lanka with more statistical precision. This study focuses on powerful regionally diverse socio economic and cultural factors as determinants of regional development dynamics in Sri Lanka. We expect the results of this research to help a better understanding of regional development imbalances and the required policy corrections.

Objectives

The main objective of this study is to investigate the determinants of regional economic development disparities in Sri Lanka. The other objective is to identify possible policy implications to mitigate the regional economic disparities.

Methodology

This study uses annual panel data for the nine provinces (Western, Central, Southern, North Western, North Central, Uva, Sabaragamuwa, Eastern, and Northern Provinces) in the country considering the period from 2010-2015. The data were extracted from annual reports of the Finance Commission of Sri Lanka, annual reports of the Labour Force Survey of the Department of Census and Statistics, Sri Lanka and annual reports of the Central Bank of Sri Lanka.

This study uses a Fixed Effect Multiple Linear Regression Model for the panel data analysis. At this stage of our model estimation, we specify the regression model based on the characterization of regional development disparities assumed to be closely associated with per capita of PGDP. This measurement in regional development analysis is supported by the literature on previous research as well (Antonescu, 2014; Wijerathna *et. al*. 2014; Cai, Fang *et. al*. 2002). The Fixed Effect Multiple Linear Regression Model can be specified as follows:

$$PGDP_{it} = \alpha_0 + \alpha_1 \mathrm{CEXP}_{it} + \alpha_2 \mathrm{REXP}_{it} + \alpha_3 \mathrm{IEDU}_{it} + \alpha_4 \mathrm{IHEL} + \alpha_5 \mathrm{IRS}_{it} + \alpha_6 \mathrm{UNEM}_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

With PGDP: per capita GDP, CEXP: Capital Expenditure (Criteria Based Grant), REXP: Recurrent expenditure, IEDU: investment in education sector (Province Specific Development Grant), IHEL: investment in health sector (Province Specific Development Grant), IRS: investment in road sector (Province Specific Development Grant), UNEM: unemployment rate, μ_i: individual specific fixed effect, ε_{it}: error term (0, σ^2). All the independent variables except UNEM are presented as absolute values (Rs. Million).

Results and Discussion

As the first step of the data analysis the pooled regression (OLS) was conducted. Since the study mainly focuses on panel data analysis, the Fixed Effect Multiple Linear Regression Model was conducted following the Hausman test. According to the results of Hausman test, the Null hypothesis is rejected at 1% significant level implying that fixed effect estimation is preferable compared to random effect estimation.

Table 1: Results of the fixed effect estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.

CEXP	29.44	11.38	2.58	0.014**
REXP	22.81	2.48	9.18	0.000*
IEDU	150.33	76.11	1.97	0.055***
IHEL	-120.27	253.09	-0.47	0.637
IRS	-223.649	124.69	-1.79	0.080***
UNEM	-16142.48	10636.57	-1.51	0.137
C	176981.30	64530.95	2.74	0.009
R-squared	0.88	Mean dependent var		359844
Adj. R-squared	0.83	S.D. dependent var		128118

The estimation results reveal that Capital Expenditure (CEXP), Recurrent Expenditure (REXP), investment in education sector (IEDU) and investment in road sector (IRS) variables affect the provincial PGDP since these independent variables are statistically significant, while other independent variables namely investment in health sector (IHEL) and unemployment rate (UNEM) are not significant. Furthermore, CEXP, REXP, IEDU are positively associated with provincial PGDP while IRS has a negative association.

Table 2: Cross-sectional effect

	Province_variables	Effect
1	Western	222768.80
2	Southern	-16452.98
3	Uwa	-26958.27
4	Central	-40715.65
5	Sabaragamuwa	-64233.33
6	North Western	-38160.82
7	North Central	-38485.49
8	Eastern	-58950.50
9	Northern	-18939.31

Results of the estimation imply that provincial capital and recurrent expenditure, investment in education sector are statistically associated with an increase in provincial per capita GDP. Moreover, these expenditures are the main determinants of the differences in provincial per capita GDP. Moreover, cross-sectional effect is also estimated in order to identify the regional disparities in terms of provincial per capita GDP. The results (see Table 2)

indicate that except for the GDP per capita of Western Province, values of per capita GDP of other provinces are less than the intercept value of per capita GDP, which implies that the income accumulation within the Western Province occurs at a higher level, while less income accumulation is taking place in other provinces in the country. This difference arises mainly due to the concentration of a large portion of leading economic activities and availability of related facilities in the Western Province compared to other provinces of the country. Thus, it directly connects to the production process and market formation. This process stimulates and leads to the creation of more income in the Western Province and unequal income distribution across provinces in the country.

Conclusion

Findings of our study show that greater income concentration is experienced in the Western province, while other provinces experience less income accumulation, which leads to adverse impacts on the development potentials of other regions. Furthermore, these results indicate that differences in provincial-wise capital and recurrent expenditure, and investment in education sector help increase the level of provincial-wise per capita GDP. The estimation results therefore, implies that if the prevailing situation is allowed to continue in the development discourse in Sri Lanka, achieving political stability would be a futile objective at the cost of enormous economic hardships to the majority in the society at national level.

If the current development policy were to achieve this objective, spatially targeted or place-based development should be prioritized. This may need tax concessions for industries to locate in lagging provinces or private-public partnerships to stimulate location of industries in such lagging regions. Since the current system of local government is complex in functional procedures and weak in capacity, the central government should take the necessary initiatives in this regard. Therefore, the lagging regions such as Northern, North Central, Uva, Sabaragamuwa and Eastern urgently need more financial allocations to upgrade social and physical infrastructure, and facilitate the livelihoods of the people.

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Integrating Women in the Clean Energy Supply Chain: Identifying Patterns and Barriers to their Inclusion Using Case Studies of Clean Energy Projects in India

P. Chauhan

Centre for South Asian Studies, Jawaharlal Nehru University, India

***Keywords**: Gender; Clean Energy; Supply Chain; SDGs*

Introduction

The 2030 Agenda for Sustainable Development provides a holistic approach to development by integrating its social, economic and environmental dimensions, and making the process participative by engaging all the relevant stakeholders, including women, and implementing the principle of "leaving no one behind." While the SDGs recognise the importance of gender equality (SDG 5), and clean and affordable energy (SDG 7) separately, there exists a gender-energy nexus which makes the two goals mutually reinforcing. The gender-energy nexus arises because of different energy needs of men and women due to gendered roles and responsibilities in the household and society. Women share a disproportionate burden of domestic chores like cooking, and therefore energy becomes their primary responsibility in a household; most of which is obtained from traditional biomass fuels such as wood, charcoal, and agricultural wastes due to lack of access to cleaner forms of energy.

Such dependence of women on traditional fuels is a cause for concern due to various reasons. Firstly, the task of fuelwood collection is physically exerting and unsafe. Secondly, it takes away most of their time, subjecting them to time poverty and leaving little or no time for them to undertake productive activities. Thirdly, the use of traditional fuels causes indoor pollution and has adverse health effects. In India, 53 percent of the population lacks access to clean fuels and technologies for cooking, with time spent per day on collecting such fuels ranging from 40 minutes to 2 hours and exposure to smoke from traditional fuels causing 481,738 premature deaths in 2017 (Data World Bank, 2017; IEA 2019). Access to clean energy for women has the ability to reduce

their time and energy poverty. For instance, a study found that the use of an improved cookstove could reduce the time spent on cooking by 20 minutes, which was further reduced by 1 hour 10 minutes with a stove using non-solid fuel. This leaves them with more time for productive activities, and therefore expands women's opportunities for education and paid employment.

The existing literature that explores the gender-energy nexus sees women as victims of energy poverty, recognises the need to reduce their drudgery within the sphere of household, and accordingly considers them as beneficiaries of increased access. However, the emerging literature on gender-energy nexus goes beyond the role of women as "users" and "beneficiaries" of clean energy and emphasises the role that women can play in expanding clean energy. Such literature argues for women being active stakeholders and part of the process of providing clean energy. The underlying basis is that since women are the ultimate consumers of energy, they drive demand for household energy and determine shifts in energy use patterns; therefore making it imperative for the clean energy initiatives to be reflective of their energy requirements.

One of the ways in which this can be done is by integrating women in the energy workforce, particularly in the supply chain of clean energy products and services, as it will cater to women's energy needs better, and bring greater acceptability and adoption of such products. As such, integrating women at all levels of the supply chain including product design, production and manufacturing, distribution and sales, and after sales services is called for. Based on this, the paper investigates the opportunities and barriers for women's integration at all the levels of the clean energy supply chain, and identifies the key determining factors for the same through case studies of ongoing initiatives in India like SURE, Solar Saheli, Barefoot, SEWA and Jagriti for markets for clean cookstoves and rooftop solar systems.

Objectives

The objective of the paper is to understand the evolving nature of the gender-energy nexus in the context of making women a part of the clean energy workforce. The goal is to identify entry points for women in the clean energy supply chain in India, including product designing and corporate segment,

production and manufacture, distribution and sales, and after-sales customer service; and to identify key determining factors that will facilitate such integration. Further, the paper seeks to identify the barriers that hamper the involvement of women at each level of energy supply chain, and examine the impact of gender roles on such integration.

Methodology

The research is developed through a survey of existing data and review of relevant literature and existing initiatives and programmes in the discipline. The research is quantitative and uses statistical tools to analyse data. The observations are inferred from data sets for a 15-year period from 2002-2017. The sectoral scope of the research focusses on the market for clean cookstoves and rooftop solar systems. Research methods include trend analysis, case studies and sector-specific comparative analysis. Quantitative assessment of data on use of traditional fuels, access to clean energy among women and adverse effects of energy poverty among women on their productivity and health has been done and inferences drawn for the gender-energy nexus. Further, a sector-specific quantitative data analysis for women's integration in the clean energy supply chain has been done using trend analysis method and cross tabulation of data on variables including overall women's participation in the clean energy workforce in each sector to be further disintegrated into women's participation at each level of the clean energy value chain. These variables have also been corroborated by undertaking the case study of SURE and Solar Saheli projects in India to establish causality among the key variables and the outcome, and provide a sector-specific comparative assessment. The case study method has further been used to draw on the experiences of projects including SURE, Solar Saheli, SEWA and Jagriti and make inferences on barriers for women's integration in the clean energy supply chain. For the purpose of assessing barriers to women's integration, the key variables assessed are availability of micro finance and institutional credit, role of education in terms of level of education - for instance higher secondary, and type of education - for instance technical and managerial education. All these variables have been identified based on review of literature, availability of datasets and objectives of the research. The main sources will consist of database and reports from international organisations, national governments

and local projects including IRENA, Global Clean Cooking Alliance, UN Women, UNDP, Energia, IRADe.

Results and Discussion

There are differences in patterns in women's integration in clean energy supply chain across sectors: There are variations in women's participation in clean energy supply chain across sectors. In rooftop solar systems, women are most prevalent in office based positions of designing (18 percent) and corporate levels (34 percent), while for clean cookstove, women are primarily engaged in the distribution and customer care services to the exclusion of designing and production segment.

Patterns in women's integration in clean energy supply chain are determined by gender roles and norms in society: Factors determining women's participation in the clean energy supply chain include safety and security concerns, limited mobility outside the household, reluctance to interact with men, and preferences and ease of working with women in the community. The determining factors are the same for both the selected sectors.

Lack of technical education is a key barrier to women's integration at the level of product designing, maintenance and operations, and customer care: For women as product designers and service providers of clean energy products, lack of technical education remains the biggest barriers, affecting their skill development and impeding their integration in the clean energy supply chain.

Lack of access to finance is the main barrier for women's integration as consumers and suppliers in clean energy supply chain: For women as consumers, unaffordability of energy products and difficulty in access to finance limits their purchasing power for clean energy. Lack of access to finance also limits women's participation as energy entrepreneurs since it limits the capital required for purchase of inventory and maintain operations.

Different approaches to provide finance rely on similar women's network and collectives: Jagriti, an NGO in the Himachal Pradesh that promotes energy efficient technologies, ensures customer affordability by negotiating directly

with fuel and cookstove providers to provide the product in bulk. It organises women savings and credit groups (WSCG) where women are expected to pay their group organiser in small monthly instalments over six months. They also support members to make payments by allowing them to access intra-group loans and group collateral. Self-Employed Women's Association (SEWA) Bharat mobilises subsidy from government schemes and facilitates financing from nationalised banks and SEWA Bharat's micro-finance models like the SHGs and credit cooperative to buy products on loan. It also partnered with the IFC to provide accessible loans to its members for procuring clean energy products. Their Grassroots Trading Networks for Women (GTNfW) intermediate with local banks to provide "Hariyali loans" to target families. The IFC have set up a partial credit guarantee scheme to provide capital to the initiative. While the approaches to provide finance are different, they rely on women's networks and organises them in collectives.

Conclusion

Against the background of the role that women can play in expanding clean energy access, the trends in their integration into clean energy supply chains vary across sectors and segments. Despite such variations, the factors that determine such integration show similarity and are based on the gendered norms and roles that exist in society. Further, the barriers to integration are mostly in the form of lack of access to finance and lack of technical education and need to be addressed. In such a scenario, there is a need to integrate women at all levels for better functioning of clean energy markets. For instance, including women at the product designing stage can make the product culturally appropriate and better cater to women's cooking needs. The issue of lack of finance for women has till now been addressed using micro-credit facilities and SHGs. However, there is a need to go beyond those institutions to enhance financial inclusion for women and provide institutional credit. The projects to promote clean energy access should focus on capacity building and skill development of women to enable them to access technical jobs in the clean energy sector, and increase their participation in policy making. Further, there is a need to engender energy projects and policies to provide equal access to resources and enhance women's role in decision making. This will ensure

that women are not left behind and get equal opportunities to participate and benefit from transition to clean energy.

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The Impact of the Proportion of Female Directors on Firm Performance: An Approach to Achieve Gender Equality

A. C. H. F. Zainab, H. D. N. N. Senavirathna, W. M. S. Priyashantha, T. A. D. K. Yasarathna and M. D. R. K. Jayathilaka

SLIIT Business School
Sri Lanka Institute of Information Technology, Sri Lanka.

Keywords: *Colombo Stock Exchange; Financial Performance; Gender Equality; Women Directors*

Introduction

Sri Lanka is well known as a country that ended a 30-year civil war of which the scars have not yet healed. The end of this brutal civil war was also a beginning of a new era of peace and development. Sri Lanka can only achieve sustainable development via long-term investments in economic, human and environmental capital. The inclusion of a focus on gender equality as the 5th goal within the Sustainable Development Goals (SDGs) illustrates the importance of women's contribution to the economic growth. Both empowering women and ending gender based disparities are essential for sustainable development. More vigorous efforts will be required in order to achieve gender equality in terms of women's empowerment even though it is evident that there are changes in the stereotypes that prevailed in the past. If a country makes better utilization of its female population, it would pave the way to increase economic growth, reduce poverty levels and enhance the well-being and living standards of its citizens. In order to close the gender related gaps, the governments have the responsibility to take into account the gender dimensions while implementing policies so that it can ensure that it doesn't fail to make complete utilization of human capital resources (OECD, 2008).

The focus and concern for women representation in business management has increased specially after the financial crises and corporate scandals such as Lehman Brothers and Enron. Many countries in Europe have adopted regulations in the form of legislative gender quotas for corporate boards. The main aim of implementing such gender quotas is to break the glass ceiling and

provide an equal chance for both males and females in reaching top positions of companies. However, the underpresentation of women in senior positions in Sri Lankan firms indicates that they do not play a dominant role in the labour force as do females in developed economies. This is mainly due to women in developing economies such as Sri Lanka being typically confined to family and domestic roles and therefore tending to have invisible barriers in climbing up the corporate ladder and representing themselves on boards. Therefore, the Labour Force Participation Rate (LFPR) is low in Sri Lanka mainly due to the low contribution of women to the LFPR (CBSL, 2014).

The issue of underrepresentation of women in corporate boards has gained substantial attention in today's corporate world. There is a significant amount of evidence supporting this research issue in the developed countries. "In an attempt to address this question, many scholars in the recent years have studied the effect of women directors on firm performance. However, the empirical evidence of the extant literature inconclusive and most studies focus on firms in the U.S. and a few other developed economies" (Liu, Wei and Xie, 2014, p.170). Thus, investigating this research gap in a Sri Lankan context will be important to identify the extent to which women directors in the listed firms of Sri Lanka have the power to make strategic decisions and enhance firm financial performance. The role of public listed companies is important since they have the ability to boost the performance of an economy by contributing to the growth of financial institutions, creating employment opportunities and developing infrastructure facilities. If board gender diversity can trigger profitability and performance of the listed firms, then it will also be a determinant for economic growth.

Objective

The main purpose of this study is to investigate the impact of the proportion of female directors on firm performance of companies listed in the Colombo Stock Exchange (CSE).

Methodology

In order to investigate the impact of the proportion of female directors on firm financial performance, this study is based on a panel data set of the 297 CSE-

listed companies. There are two main panel estimation methods commonly used in literature which are pooled Ordinary Least Squares (OLS) and panel regression with Fixed Effects (FE). However this study employed panel regression FE to estimate the main regression model as this method helps to avoid constant omitted variable bias and yearly FE due to unobservable heterogeneity. This study overcomes limitations of the existing Sri Lankan literature by selecting all the listed firms in all the CSE classified sectors during the period of 2012 to 2018. Consisting of unobservable and unavailable data, the final data set consists of 1,865 firm-year observations on over 281 listed companies. The following is the main regression model in this study:

$$FFP_{it} = \gamma\, BGD_{it} + \beta_1 BC_{it} + \beta_2 FC_{it} + \alpha_i + \pi_t + \varepsilon_{it}$$

with FFP: Firm Financial Performance (Return on Assets ratio), BGD: Board Gender Diversity (Propotion of women directors on board), BC: Board Char (Board characteristics), FC: Firm Char (Firm characteristics), *i*: Company and *t* : Time, α: intercept, π : Individual impact with the time and ε: white noise error term.

Variables of the regression model were chosen based on the common variables used to measure the impact of women directors on firm performance in the literature. *Financial Performance* measures the extent to which companies achieve their financial goals and this is essential to determine the success of the firms. In this study, Return on Assets (ROA) ratio is used as the proxy to measure financial performance since ROA is a widely used financial performance indicator (Liu, Wei and Xie, 2014). This ratio can be calculated as net income divided by total assets. The proportion of women directors on the board is taken as proxy to measure the BGD. This was measured using the percentage of female directors on the board. Control variables used in this model are grouped into two categories, BC and FC. The board characteristics consist of chairwoman, independent board directors, board size and Chief Executive Officer (CEO) duality while the firm characteristics consist of leverage and firm age. With regards to the control variables, chairwoman is a dummy variable that equals 1 when the board chair is a woman and 0 otherwise. Independent directors is the percentage of independent directors in the board. Boardsize is the natural log of the board size. CEO duality is a variable that equals 1 when the chairperson and CEO is the same person and

0 otherwise. Leverage is the total debt divided by total assets. Firm age is the natural log of the number of years that the firm is listed with CSE.

Results and Discussion

Table 1 shows the descriptive statistics for all the variables used in this study for 1865 firm–year observations. The approximation of ROA has a mean value of 5.2%. The mean percentage of women in the director board is 0.08 which is remarkably low. The average board size is equal to 8.02 and the maximum number of directors in the board is 18 while the minimum is 2. Average independent directors of the director board, is reported as 38.8%. The average leverage ratio reveals that the CSE listed companies have a mean of 45.6% of debts relative to their assets.

Table 1: Summary statistics of panel regression model

Variable	Obs.	Mean	Std	Min	Max
Performance measures					
ROA (net income/assets)	1865	5.2	0.15	-2.18	2.52
Board gender characteristics					
% of women directors	1865	8.4	0.11	0	0.75
Control variables					
Board characteristics					
Chairwoman	1865	4.0	0.19	0	1
% of independent directors	1864	38.8	0.14	0	2.08
Board size	1865	2.04	0.30	0.69	4.50
CEO duality	1865	13.2	0.33	0	1
Firm characteristics					
Leverage	1865	45.6	0.40	0	6.68
Firm age	1795	2.78	1.02	-0.69	4.28

This study employs FE method to estimate the effects of board gender diversity on firm financial performance. Table 2 shows the findings of the main regression model.

Table 2: Results of Regression Model

	ROA (net income/assets)	
	FE	SE
%_Women	0.1332*	0.0757
Woman_Chair	-0.0377	0.0397
%_Independent	-0.0041	0.0407
Ln_Boardsize	-0.0269	0.0189
Duality	0.0421	0.0318
Leverage	-0.0236*	0.0148
Ln_FirmAge	-0.0236**	0.0103
Constant	0.1713***	0.0524
R^2 within	0.0110	
between	0.004	
overall	0.001	
F. Sig	0.0144	
rho	0.6007	

Note: *** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.
SE: Standard error of each coefficient.

The results suggest that women directors have a positive and statistically significant impact on firm financial performance. For instance, with a 1% rise in percentage of women directors, ROA increases by 0.13%. With regards to other control variables, results in Table 2 reveals that leverage and firm age have a significantly negative impact on ROA while the other control variables do not have any statistically significant impact. Therefore, the positive impact created by women directors on the financial performance of the firms implies that gender diverisity can be beneficial for firm performance. In addition, the presence of women directors on the board can attract more female employment and lead to an increase in the female LFPR and eventually contribute to the potential output of the economy. Female directors have the ability to create a positive impact on the financial performance of the firms since their presence in the board may reduce the agency conflict or the cost as they are more responsible of their duties and tend to freely express their opinions while having a concern for the shareholders' wealth (Pasaribu, 2017). Proper gender diverse boards improve monitoring and controlling functions by increasing the effectiveness of decision making. The reason is that the women directors tend more towards questioning while men are stumble to ask questions (Wellalage

and Locke, 2013). A balanced board always provides more opportunities of achieving competitive advantages over market challenges than boards which are completely dominated by male directors (Liu, Wei and Xie, 2014).

Conclusion

The empirical findings of the research reveal that women directors have a positive and statistically significant impact on firm financial performance. It also reveals that leverage and firm age have a significantly negative impact on firm financial performance. In developing economies such as Sri Lanka the effectiveness of corporate boards resulting from gender diversity is still a new area of research. In order for the Sri Lankan economy to grow at a reasonably high pace and to meet the changing demands of the various sectors, there should be well diversified labour force and corporate boards. By tracking the presence of female directors in this study, the extent to which boards are dominated by men, and whether women have attained an equal opportunity to dominate with power in the corporate environment of Sri Lanka, will be evident. Unlike the firms in many developed economies, Sri Lankan listed firms have no compulsory gender quotas to comply with when determining its board gender composition. The findings of this study will be important for the practitioners as it provides a contribution in support of female composition in corporate boards. It will also be useful for policy makers such as United Nations (UN) since such organizations are interested in ensuring the rights of women and in implementing gender inclusive policies. Moreover, the results obtained will support institutions such as the International Finance Corporation (IFC) of the The World Bank to increase the representation of women directors in the corporate boards of the firms in Sri Lanka. This study encourages women participation in senior positions and corporate boards thereby reducing the gender based discrimination in such positions since it is evident from these results, that women directors also have the ability to drive the financial performance and increase the profitability of various sectors in Sri Lanka and they equally deserve the right to be a part of every company's corporate board. Therefore, it is important to strategically focus on gender diversity in the process of policy making and gender equality related sustainable development.

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Impact of Board Diversity on Firms' Economic Sustainability in Sri Lanka

H. M. C. K. Herath, A. D. K. P. Madushani, H. D. R. M. Mel, W. M. B. K. Weerasooriya and M. M. D. de S Gunawardena

SLIIT Business School
Sri Lanka Institute of Information Technology, Sri Lanka

***Keywords**: Board Diversity; Economic Sustainability; Business; Sri Lanka*

Introduction

Sustainability is one of the most recent trends, which has become an integral part of the developing business world. Every type of business regardless of its size should apply sustainability for its success. Economic sustainability is measured in terms of financial performance of a firm. Therefore, sustainable development affects financial performance of the business firm. To increase the financial performance of a firm, it is important to have a diversified board which generates effective decisions for the company. As such, this will set the background for supportive working conditions, thereby enabling economic growth of the company. Variety inherent in boards' composition referred to as board diversity, can be measured via a number of dimensions, such as gender, ethnicity, nationality, educational background, industrial experience and organizational membership (Kevin Campbell, 2008).

Evidence on board diversity in the recent literature is that it is comparatively low in Sri Lanka (Nirosha Hewa Wellalage, 2013). Increased emphasis on sustainability by firms could have a positive influence on the board diversity in Sri Lanka. Therefore, this study aims to measure the impact of board diversity on firms' financial performance in Sri Lankan listed companies in 2018. This study draws on agency theory and human capital theory which have been identified from the literature on board diversity. Agency theory discuss the conflicts between the interests of owners and managers. Human capital theory focuses on the experience of board members. It is concerned about how directors' experience affects firm performance. Furthermore, agency theory and resource dependency theory posit a positive effect of board diversity on

firm performance. Agency conflict occurs due to the separation of decision making and risk bearing of a company, and agency problem occurs at any point where the managers have an intention to pursue their own interests (Eugene F. Fama, 1983). Resource dependency theory provides an explanation for a board's function of providing critical resources to the firm. Moreover, there is a positive linear relationship between board demographic diversity and firms' financial performance. This means that board of directors were in a position to provide better resources to the knowledge intensive firms (Muneza Kagzi, 2017).

Objectives

The first objective of this study is to identify the reasons behind low board diversity in Sri Lanka and the second objective is to measure the impact of board diversity on firm financial performance.

Methodology

The data collection methods differed according to the objectives of this research where semi structured interview method was adopted to collect data on reasons behind board diversity status in Sri Lanka. Since the population of the directors and academics were not directly quantifiable, a sample of senior professionals holding directorships in top profile blue chip companies in Sri Lanka and also senior academics specialized in relevant fields were chosen to conduct interviews. Due to time constraints and busy schedules of directors, sample was limited to 10 directors and academics and the respondents were chosen using the snowball method. The sample consisted of 70 % males. They represented different industries including Bank, Finance and Insurance, Hotels and Travels and Diversified Holdings.

The operational definition used was the following: "Board diversity may be defined as the variety inherent in a board composition. This variety can be measured on a number of dimensions such as gender, age, ethnicity, nationality, educational background, industrial experience and organizational membership" (Kevin Campbell, 2008). This study uses six variables to measure board diversity. These variables include, gender, ethnicity, nationality, educational qualifications, industrial experience, and organizational membership. According to the literature, most of the researches

focused on diversity factors such as, age, gender, educational qualifications and ethnicity. However, this study focuses on more diversity factors such as, industrial experience and organizational membership compared to other studies.

Table 1: Measurement of variables

Variable	Measurement
Gender	Proportion of male directors to the total
	Proportion of female directors to the total
Ethnicity	Proportion of Sinhalese directors to the total
	Proportion of Tamil directors to the total
	Proportion of Muslims directors to the total
	Proportion of other ethnic directors to the total
Education - Academic	Proportion of Bachelor's Degree Holders to the total directors
	Proportion of Master's Degree Holders to the total
	Proportion of PhD Holders to the total
	Proportion of directors who don't have Higher Educational Qualifications
Education – Professional	Proportion of FCA Members to the total directors
	Proportion of FCMA Members to the total directors
	Proportion of directors who don't have professional qualifications
Industrial Experience (Area)	Proportion of directors with Management experience to the total
	Proportion of directors with Finance experience to the total
	Proportion of directors with IT experience to the total directors
	Proportion of directors with Law experience to the total
	Proportion of directors with Engineering experience to the total
Organizational Membership	Proportion of Executive directors to the total
	Proportion of Non-Executive directors to the total

This study uses Blau Index which is widely used to measure of board diversity (Kevin Campbell, 2008). It calculates the proportion of board members (p) of each category.

$$\text{Blau Index} = 1 - \sum_{i=1}^{n} p_i^2$$

Where *i* is no. of firms, p is the proportion of number of directors to the total and n is the total no of board members

Furthermore, different diversified category results cannot be compared due to the differences in diversity categories. Therefore, this study uses adjusted blau index by using $1 - 1/k$ where k is the number of categories used to measure each variable (Alan Agresti, 1978). Economic sustainability is measured in terms of financial performance in a firm. Hence this study uses two proxies to measure the firm's financial performance. First proxy is ROA. It can be defined as how profitable a company is relative to its total assets (Nirosha Hewa Wellalage, 2013). Tobin's Q (total market value of firm divided by its total assets) is the second proxy of this study. It can be measured by the total market value of the firm divided by the total assets of the firm. In addition to that, this study used control variables such as firm size and leverage which have not been used in past research (Nirosha Hewa Wellalage, 2013). Firm Size is the natural logarithm of total assets and leverage is measured by total debts divided by total assets of each and every firm. Two regression models are used to identify the impacts of different variables on ROA and Tobin's Q.

Results and Discussion

The industry experts and academics who were interviewed commonly stated that they believe the board diversity in Sri Lanka is low. The analysis of the semi structured interviews provides five key factors driving low board diversity in Sri Lanka. The reasons include, appointing family members to the board, inviting allies to perform as board members, male dominant culture in Sri Lanka, glass ceiling for working women and weak corporate governance provisions. Firms which have started as family businesses and later expanded as public listed companies show a tendency to appoint family members to their boards of directors. Reasons behind that could be to protect confidentiality of company information and to keep ownership control within a certain family. Another reason is, the Nomination Committee may have a tendency to invite people who are close affiliates of those already in the board and whom they can trust. As such there is a tendency away from factors that can enrich a board and improve firm performance such as gender, education qualifications and experience etc. The main reasons for low gender diversity in Sri Lanka can be

surmised to stem from the male-dominant culture influencing the organizational culture, along with a general tendency for the females to prefer not to take higher responsibilities since they would have to compromise their family responsibilities. Moreover, according to a corporate governance expert who was interviewed, Sri Lanka does not have a proper and well diversified corporate governance code in place. As shown in Table 1 this study used six variables to measure board diversity. The Blau Index was used to measure the independent variable while ROA and Tobin's q were used to measure firms' financial performance. Firm Size and Leverage are used as the control variables. Regression analysis was carried out to measure the impact of board diversity on firms' financial performance.

Table 2: Board diversity and firms' financial performance

	ROA			Tobin's Q		
Variable	b	T	Sign.	B	t	Sign.
(constant)	-0.085	-0.97	0.331	1.391	5.439	0.000
Gender	-0.031	-0.71	0.479	0.046	0.355	0.723
Ethnicity	0.054	0.984	0.327	-0.268	-1.675	0.096***
Aca_Q	0.036	0.478	0.633	-0.037	-0.166	0.869
Pro_Q	0.023	0.452	0.652	-0.159	-1.054	0.294
Nationality	-0.013	-0.30	0.764	0.473	3.634	0.000**
Ind_Exp	0.002	0.027	0.978	-0.495	-2.739	0.007***
Org_Mem	0.001	0.014	0.989	0.092	0.686	0.494
Leverage	-0.051	-1.76	0.08***	0.092	1.077	0.283
LN_FZ	0.005	1.747	0.083***	-0.036	-4.003	0.000**
R^2		0.050			0.225	
Adjusted R^2		-0.01			0.173	

Notes: ***Significance at 10% level; **Significance at 5% level.

Aca_Q: Academic Qualification, Pro_Q: professional qualification, Ind_Exp: industry experience, Org_Mem: organizational membership, LN_ FZ: natural logarithm of firm size.

Results of the regression analysis are summarized in the Table 2. According to the results, diversity variables do not have significant impact on firms' ROA. However, ethnic and industrial experience variables are positively and statistically significant at 10% level for Tobin's Q. In addition to that, Nationality has a positive and significant impact on firms Tobin's Q.

Conclusion

The measurement of the impact of board diversity on financial performance in Sri Lanka by a regression analysis shows that diversity variables do not have a significant impact on firms' ROA and ethnic diversity. And industrial experience diversity variables are positively and statistically significant for Tobin's Q. Moreover, National diversity has a positive and significant impact on firms Tobin's Q. So the most important thing is a firm's economic sustainability is measured by the Financial Performance of the firm and financial performance shows how sustainable a firm is in its economic world. As such, there is no doubt that sustainability development transformed the business world effectively.

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The Dynamic Linkages between Economic Growth and Sectoral Growth: Empirical Evidence from Sri Lanka

A. Pusparasa[1] and T. Sukirtha[2]

[1]Department of Economics and Statistics, University of Peradeniya Sri Lanka

[2]Postgraduate Institute of Humanities and Social Sciences University of Peradeniya, Sri Lanka

Keywords: *Economic Growth; Sectoral Growth; Cointegration; Sri Lanka*

Introduction

The Sri Lankan economy has been undergoing a structural change over the last few decades. Agriculture, Industry and Services sectors play an important role in Sri Lanka's economic growth. The contribution of the agricultural sector to national GDP has been fast declining while industrial and service sectors are dominating and have been showing remarkable improvements. Experiences of the developed economies have shown that the sectoral growth process is highly unbalanced (Sastry et al., 2003). Most early development strategies, advocated by Rosenstein-Rodan, Nurkse, and Hirshman among others, emphasized industrial development as the main source of economic growth (Schiff and Valdez, 1998). The role of agriculture in generating economic growth was shown to be minimal with the experience of the newly industrialized countries and others. The services sector was identified as an emerging sector. Based on this, the key sector would stimulate greater economic activity in other sectors and thus have a large multiplier effect on growth and development. Therefore a proper understanding of sectoral growth is necessary for designing appropriate long run strategies to achieve a sustainable growth rate in real GDP.

While most of the literature mainly focuses on the determinants of aggregate growth, the sectoral growth literature mainly builds on the dual economic model originating in Lewis (1954) and Hirshman (1958). The dual economic model seeks to explain economic growth by emphasizing the role of sectors.

Based on this theoretical context, there is no in-depth study on the inter relationship between sectoral growth and economic growth in Sri Lanka. Thus, this study attempts to examine the relationship among sectors and economic growth in Sri Lanka.

Objective

The main objective of this study is to examine the inter temporal dynamic linkages between sectoral growth and economic growth in Sri Lanka.

Methodology

The data used in this study are annual observations spanning the sample period from 1960 to 2018 and data were extracted from Annual Reports of the Central Bank of Sri Lanka. The data of Log Real Gross Domestic Product (LRGDP) is used to proxy economic growth. LogGDP of Agriculture (LGDPA), LogGDP of Industry (LGDPIND) and LogGDP of Services (LGDPSER) are used as proxies for sectoral growth. Three models were estimated for each sector of the economy as given below:

Model 1: $$\mathrm{LRGDP_t} = \alpha_{01} + \alpha_{11}\mathrm{LGDPA_t} + \mathrm{U_{1t}} \quad (1)$$

Model 2: $$\mathrm{LRGDP_t} = \alpha_{02} + \alpha_{12}\mathrm{LGDPSER_t} + \mathrm{U_{2t}} \quad (2)$$

Model 3: $$\mathrm{LRGDP_t} = \alpha_{03} + \alpha_{13}\mathrm{LGDPIND_t} + \mathrm{U_{3t}} \quad (3)$$

The first step of this analysis is to test the order of integration of each series using Augmented Dickey Fuller (ADF), Phillips Perron (PP) and Kwiatkowski Phillips Schmidt Shin (KPSS) unit root tests. Secondly, lag length selection criteria such as AIC, SIC, LR, FPE and HQIC are utilized to select the optimum lag length that can be included in the model. Thirdly, residual series of each cointegration regression model is tested for unit root using ADF approach. Fourthly, once we confirm the regression error residual as stationary, Engle Granger (1987) cointegration test is conducted to determine the long run relationship between the variables. Then, the Error Correction Model (ECM) is employed to identify the short run relationship as well as long-run adjustment among the variables.

Results and Discussion

The results of ADF, PP and KPSS tests confirmed that all the variables are integrated of order one. Since all the variables are integrated at the same order, the data set is appropriate for further analysis. According to the regression error residual stationary test, all residuals of cointegration model is stationary at 5% level of significance. Thus, the Engle-Granger (EG) co-integration test using fully modified OLS estimation provides evidence of long run relationship between sectors and economic growth. Thus, Long run relationship among the variables are shown in equation format below:

$$\underset{(0.000)}{\mathrm{LRGDP_t}} = \underset{(0.000)}{5.277} + \underset{(0.000)}{0.389}\mathrm{LGDPA_t} \quad (4)$$

$$\underset{(0.000)}{\mathrm{LRGDP_t}} = \underset{(0.000)}{1.089} + \underset{(0.000)}{0.976}\mathrm{LGDPSER_t} \quad (5)$$

$$\underset{(0.000)}{\mathrm{LRGDP_t}} = \underset{(0.000)}{1.967} + \underset{(0.000)}{0.952}\mathrm{LRGDPIND_t} \quad (6)$$

The above equations 4, 5 and 6 reveal that as expected by theory and some of the existing empirical literature (e.g., Akita et al 2008; Alhowaish et al 2012; and Singariya et al 2016) LGDPA, LGDPIND and LGDPSER have a positive and statistically significant impact on the LRGDP at 1% significant level. As shown in equation 4, a one percent increase in GDPA, would increase RGDP by 0.38 percent. According to equation 5, due to a one percent increase in GDPIND, RGDP would be increase by 0.95 percent. Equation 6 shows that, due to one percent increase in GDPSER, RGDP would be increase by 0.97 percent in the long run.

$$\underset{(0.061)}{\Delta\mathrm{LRGDP_t}} = \underset{(0.061)}{0.0042} + \underset{(0.000)}{0.403}\Delta\mathrm{LGDPA_{t-1}} - \underset{(0.000)}{0.172}\widehat{\mathrm{U}}_{t-1} \quad (7)$$

$$\underset{(0.700)}{\Delta\mathrm{LRGDP_t}} = \underset{(0.700)}{0.004} + \underset{(0.000)}{0.945}\Delta\mathrm{LGDPSER_{t-1}} - \underset{(0.047)}{0.175}\widehat{\mathrm{U}}_{t-1} \quad (8)$$

$$\underset{(0.000)}{\Delta\mathrm{LRGDP_t}} = \underset{(0.000)}{0.048} + \underset{(0.000)}{0.636}\Delta\mathrm{LGDPIND_{t-1}} - \underset{(0.002)}{0.035}\widehat{\mathrm{U}}_{t-1} \quad (9)$$

Equations 7, 8 and 9 also show that there are positive and significant relationship between all three sectors and economic growth in the short run. Negative and significant error correction coefficients of each model are -0.172, -0.175, -0.035 respectively. They reveal that disequilibrium is corrected by each year 17.2%, 17.5%, 3.5% respectively. They indicate that real GDP moves towards long run steady state of RGDP.

Conclusion

The purpose of this study was to empirically investigate the relationship between sectoral growth and economic growth of Sri Lankan economy over the period 1960 to 2018. The study provides evidence to confirm the long run equilibrium relationship between sectors and economic growth. Positive significant relationships hold for all sectors in the short run. The study results indicate that industrial and service sectors contribute to economic growth relatively more than the agriculture sector. Thus, the government should assisting in developing these two sectors to have sustainable economic growth. However, a large number of households' livelihood depends on agriculture sector. Thus, the government should promote and assist the agriculture sector in order to have balanced and sustainable economic growth.

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The Impacts of Fiscal Decentralization on Health Outcomes in Bangladesh

M. Murshed

Bangladesh Institute of Development Studies (BIDS), Dhaka, Bangladesh

Keywards: *Sustainability; Health Outcomes; Policy Reforms; Bangladesh*

Introduction

In exhibiting solidarity to the universal commitment to secure sustainability in healthcare, governments across the globe have warranted policy reforms to enhance the efficiency of public healthcare service deliveries. Hence, taking the health sector development into cognizance, governments worldwide have gradually embarked on decentralization of fiscal expenditure patterns, particularly, following the anticipation of ensuring better efficacies of public healthcare investments through the empowerment of local governments (Cavalieri and Ferrante, 2016). It is hypothesized that sub-national financing of public funds, allotted for the health sector, can catalyze allocative efficiencies which, in turn, is thought to entail significant impacts on the overall health indicators within the economy (Martinez-Vazquez, Lago- Peñas and Sacchi, 2017).

However, though a plethora of studies documented in the existing public finance discourse have voiced in favor of positive health outcomes emerging from the fiscal decentralization decisions, it is yet to reach a consensus. For instance, in studies by Jin and Sun (2011) and Samadi et al. (2013), the authors found fiscal decentralization in China and Iran exerting adverse impacts on infant mortality and under-five mortality rate, respectively. Moreover, linking decentralization to poor public health care delivery, Ablo and Reinikka (1998) reported statistical evidence of decentralization decisions dampening public health investments in the local districts of Uganda. Thus, following the ambiguity in the nature of the nexus between fiscal decentralization and the health outcomes, it is pertinent to evaluate the dynamics of this correlation for crucial policy implications.

Objectives

Against this milieu, this paper focuses on evaluating the justification of fiscal decentralization with respect to enhancing health outcomes in Bangladesh. This paper specifically builds on the hypothesis that sub-national financing of public health expenses in Bangladesh could be effective in enhancing the efficacy of the associated public health service deliveries. In addition, this paper analyses whether the results are robust to the quality of democracy in Bangladesh.

Methodology

The econometric exercises considered in this paper are based on empirical models in which the key health indicators are expressed as separated functions of the fiscal decentralization indicator, controlling for the relevant macroeconomic aggregates. The functional form of these models can be given as follows:

$$Health_t = \int (DECENT1_t, X_{it}) \quad (1)$$

where $Health_t$ is a set of key health indicators which include infant mortality rate, neonatal mortality rate, under-five mortality rate, maternal mortality ratio, prevalence of stunting and life expectancy at birth; $DECENT1_t$ refers to the indicator of fiscal decentralization which is captured in terms of the ratio of local government expenditure to total public expenditure in Bangladesh[7]; and X_{it} denotes a set of the control variables comprising of per capita GDP (proxy for economic growth), out-of-pocket health expenditure, and the densities of hospital beds and registered doctors (per 1000 population) in the country. For robustness check, the models are re-estimated by augmenting different indicators of democratic quality and their respective interaction terms with $DECENT_t$. Finally, for further robustness check, the aforementioned econometric analyses are repeated using the value of the local government expenditure ($DECENT2_t$) instead of it being used as a share of the total public expenditure level. Following the anticipation of the quality of democratic environment within the economy affecting the efficacy of public healthcare

[7] Due to unavailability of data regarding local government expenditure on health, the aggregate local government expenditure is used as a proxy instead.

revenue disbursements, this paper also controls for democratic practices by augmenting model (1) as follows:

$$Health_t = f(DECENT1_t, DEMOC_t, DECENT1_t * DEMOC_t,\ X_{it}) \qquad (2)$$

Where, $DEMOC_t$ is an aggregate indicator of democracy in the economy. This variable is an aggregate indicator of democratic practices in Bangladesh, taking into account the states of electoral, liberal, participatory, deliberative and egalitarian democratic indices. In addition, the democratic variable is interacted with the fiscal decentralization variable to account for their combined impact on the health outcomes as well. Finally, the impacts of fiscal decentralization and democratic environment on the public health investments are evaluated using the econometric model below:

$$\text{GHEPC}_t = f(DECENT1_t, DEMOC_t, DECENT1_t * DEMOC_t,\ X_{it}) \qquad (3)$$

Where, GHEPC_t is per capita government investment in the public health sector of Bangladesh. The estimates from this particular model would impose key policy implications for the government with respect to ensuring the appropriate efficacy of public healthcare deliveries in the country. Annual data from 1980 to 2018 was used from multiple sources to perform the econometric analyses. As part of the methodology, the entire dataset is initially checked for stationarity using the Augmented Dickey-Fuller, Phillip-Perron, and Kwiatkowski-Phillips-Schmdt-Shin unit root tests, and followed cointegration analyses proposed by the Bayer and Hanck. The Fully-Modified Ordinary Least Squares (FMOLS) and the Dynamic Ordinary Least Squares (DOLS) estimators are tapped for regression purposes while the Toda and Yamamoto test for non-causality is used to deduce the causal linkages between the relevant variables considered in this paper.

Results and Discussion

The regression results broadly point towards fiscal decentralization being an effective means to improving most of the health indicators in Bangladesh. According to the FMOLS estimates, a 1% increase in the local government expenditure share of total public spending volume in Bangladesh reduces the infant mortality, neonatal mortality and under-five mortality rates on average by 0.08%, 0.14%, 0.10% respectively while enhancing the life expectancy at birth by almost 0.3%, ceteris paribus. The estimates from the DOLS estimator also corroborate to the signs of the estimated coefficients predicted using the

FMOLS estimator. These imply that subnational financing of public health investment projects, especially within the rural areas of Bangladesh, is pertinent in enhancing the quality of the aforementioned health indicators. In contrast, no statistical evidence is found to explain the impact of fiscal decentralization measures on the prevalence of stunting in children and maternal mortality ratios in the country.

The results are also found to be robust across an alternative measurement of fiscal decentralization in the country. The corresponding regression estimates denote that a 1% rise in the public revenue allocations to local governments, on average, is accompanied by 0.04%, 0.11% and 0.06% declines in the infant mortality, neonatal mortality and under-five mortality rates, respectively, and improves the life expectancy at birth by 0.02%, ceteris paribus. Similar results are found in the context of the prevalence of stunting and maternal mortality ratio as perceived from the statistical insignificance of the corresponding coefficient estimates.

However, on controlling for the quality of democracy in the economy, the signs of the health indicator coefficients get reversed implicating towards the effectiveness of such decentralization decisions being largely reliant on sound democratic environments. This implies that sound democratic environments tend to harness the positive impacts of fiscal decentralization measures with respect to ensuring development of the health indicators in Bangladesh. It is evident from the estimated coefficients that fiscal decentralization stimulates greater public investments in the health sector which can effectively explain the positive impacts of sub-national public health financing on the health indicators in Bangladesh. However, upon controlling for the quality of democracy, it is found that in the presence of inefficient democratic environments, the efficacy of fiscal decentralization with respect to the betterment of the health indicators tend to be adversely affected.

The results from the Toda and Yamamoto causality analyses exhibit unidirectional causalities stemming from fiscal decentralization to infant mortality, neonatal mortality and under-five mortality rates, without feedback. In contrast, reverse causalities were found to run from the prevalence of stunting and life expectancy at birth to fiscal decentralization which can explain the statistical insignificant relationships found between these variables. The causality estimates provide further support in favor of the

regression estimates to voice in favor of fiscal decentralization being conducive to improvement in the majority of the health indicators considered in this paper.

Conclusion

In line with results of the econometric exercise, it can be concluded that fiscal decentralization in Bangladesh is effective in improving the overall health sector to a large extent. However, the efficacies of such decentralization decisions are broadly reliant on mint democratic practices within the economy. Hence, it is ideal for the government to promote proper democratic environments in order to improve the efficiency of fiscal decentralization decisions with respect to the development of public health outcomes in Bangladesh. A major issue of subnational public financing in Bangladesh is the fact that most of the funds allotted to the local government are conditioned on being invested for infrastructural development purposes, with nominal emphasis on investment in the health sectors. Thus, it is ideal for the government to channel the local government funds towards the health sector keeping the development of the public health sector into consideration.

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The Impact of Government Debt on Economic Growth in Sri Lanka

A. S. G. S. Bandara

Department of Economics and Statistics, University of Peradeniya
Sri Lanka

Keywords: *Government Debt; Debt Crisis; Economic Growth; Sri Lanka*

Introduction

Policy makers in Sri Lanka are currently confronted with issues in macroeconomic management and increasing public debt. According to the Annual Report of the Central Bank of Sri Lanka for 2018, the total public debt of Sri Lanka is Rs.11, 977,539 million, or 82.8% of GDP, with domestic debt around Rs.6, 017,992 million or 41.6% of GDP. The total foreign debt of the government is Rs.5, 959,547 million which is 41.2% of GDP (CBSL, 2018). Comparison with previous years indicates that Sri Lanka's government debt is steadily increasing at present, while economic growth is stagnant around 3% - 4 %.

The Government obtains loans from both local financial institutions and foreign sources, as project loans and non-project loans. Government borrowed Rs. 3,149,905 million from foreign sources under project loans and Rs. 2,809,642 million under and under non-project loans (CBSL, 2018). As a result of increase in public debt and debt repayment, Sri Lankan Governments were led unable to allocate resources to various key sectors such as education, health, research and development. Previous studies have found that the domestic debt and external debt have an inverse relationship with economic growth (Atique & Malik, 2012). Expansion of public debt has been found to have a negative impact on economic growth (Chudik *et al*. 2017) and concessionary loans have been found to have a negative impact on economic growth (Fernando *et al*. 2017). In this context, the study of public debt in Sri Lanka is timely important. However, there is a limited literature on understanding the impact of government debt on economic growth. It is in this backdrop that this study is conducted to fill this research gap. This study focuses primarily the impact of government debt on economic growth.

Objective

The main objective of the study is to investigate the impact of government debt on economic growth in Sri Lanka.

Methodology

This study is developed by using a multiple regression model to identify the relationship between government debt and economic growth. The regression model can be described as;

$$lnEG_t = \beta_0 + \beta_1 lnCND_t + \beta_2 lnIMP_t + \beta_3 lnGD_t + \beta_4 lnI_t + \beta_4 lnPDS_t + \beta_6 lnPI_t + u_t \quad (1)$$

In this study, the dependent variable is economic growth (EG) and the independent variables are capital and net debt (CND), imports (IMP), total government debt (GD), investment (I), interest payments on public debt (PDS) and per-capita income (PI). 'u' is the error term and 't' is a time sub-script. This study covers the time period 1950 to 2018. The relevant data was collected from annual reports of the Central Bank of Sri Lanka. At the first step of the estimation procedure, ADF and Phillip Peron test are used to check the stationary nature of data. Johanson co-integration test is used to identify the long run relationship and Vector Error Correction Model (VECM) is used to investigate the short run relationship of these variables.

Results and Discussion

The results of the Unit Root Test confirmed that all variables are stationary at their first difference, suggesting that they are integrated in order one. The lag selection criteria suggested one lag as optimal. Johanson Co-integration rank test identified one co-integrating relationship among selected variables with confirming long run relationship. Results of the long run model are as follows;

$$\widehat{lnEG_t} = -3.40 + 0.34\, lnCND_t - 0.28 lnIMP_t - 0.52\, lnGD_t + 2.56\, lnI_t - 0.40 lnPDS_t + 0.46\, lnPI_t \quad (2)$$

Note: test statistics of slope coefficients are given respectively as (1.373), (-0.599), (1.637), (4.864), (-2.963), (2.770).

According to the above results, all variables are significant at the 5 % significance level at the long run. Therefore, these results show that cost of

capital and net debt, investment and per-capita income have a long term positive impact on Sri Lankan economic growth. Imports, public debt servicing payments and total government debt have a negative impact on the economic growth in the long run.

Table 1: Vector error correction mechanism

Variable	Coefficient	Std. Error	t-Statistic	Decision
ECM(-1)	-0.320380	0.33097	-0.9802	Insignificant

The estimated coefficient of the error correction term is negative as required by economic theory. From the above, the error correction term coefficient -0.320380 is rightly signed but not statistically significant at 5% level of significance. It indicates that just about 32% of the disequilibrium or distortion in the Sri Lankan economy is yearly being corrected for, though slowly due to the low coefficient of the ECM term.

Conclusion

Even though the government is borrowing, generally it has a positive impact on economic growth. According to this study, it shows that the increase in public debt in Sri Lanka as well as Public Debt Servicing Payments (PDS) have a negative impact on economic growth. The research found that investment, per-capita income and capital and net debt positively affect economic growth. According to the research imports are negatively correlated with economic growth. Therefore, the government should take steps to control imports, and should motivate the domestic producers by providing subsidies. It is only then that Gross Domestic Production (GDP) can be increased. It is necessary to control the depreciation of the exchange rate as it highly affects the servicing of public debt.

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Impact of Governance Indicators on FDI Net Inflows: Empirical Evidence from Sri Lanka

K. K. T. Udayanga

Department of Economics. Faculty of Social Sciences
University of Kelaniya, Sri Lanka

Keywords: *FDI; Governance Indicators; Net Inflows; Sri Lanka*

Introduction

The inflows of Foreign Direct Investment (FDI) are extremely crucial for the economic growth of developing countries. FDI provides investment capital for developing countries along with employment opportunities, management skills and updated technology which eventually leads the developing countries towards economic growth (Athukorala & Karunarathna, 2004; Nurudeen, 2010). Therefore, developing countries are attempting to obtain greater FDI inflows with the intention of strengthening their business and industries. Policies and procedures are revised continually to make it convenient for the investors to make investment in these countries (Zeshan & Talat, 2014). However, while several countries are successful in attracting greater FDI inflows, some have been facing problems in attracting FDI.

Enhancing FDI inflows is a sustainable solution for economic difficulties. FDI is critical for developmental projects, industrial growth, employment generation, technological advancement, enhancing of industrial production, reducing balance of payments deficit, increasing foreign reserves, improving infrastructure, building skilled human resources and eventually realizing economic growth (Zeshan & Talat, 2013). The economic growth of a country is also influenced by the political process including government selection process, monitoring and replacement of the governments; governmental ability to implement and formulate polies and procedures; respect of their people and position of institutions which administer social and economic interaction (Zeshan & Talat, 2014). There are six dimensions of governance mechanisms which may be useful to evaluate the governance level for the countries, identified as governance indicators (Kaufman, et al., 2009). These

indicators are Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption.

There are several pieces of research that investigates the factors influencing inflows of foreign direct investment. Rusike (2008), in analysing the determinants and trend of inward FDI to South Africa for the period 1975-2005, found exchange rates, openness and financial progress to be key variables in determining FDI inflows in the long-run. Masku and Dlamini (2009) probed locational determining variables of FDI in Switzerland by utilizing cointegration along with ECM techniques during 1980-2001. The variables tested were market size, openness of economy, infrastructure, domestic market attractiveness, external economic stability and internal economic stability. Research reveals that external economic stability, internal economic stability, infrastructure and economy's openness had positive correlation whereas home market size and domestic market attractiveness had negative correlation with FDI stock (Masku & Dlamini, 2009). Azam and Kahttak (2009) evaluated the influence of political instability and human capital on FDI stock in Pakistan for the period 1971-2005 by utilizing least squares method. The estimated results reveal a positive and significant link between human capital and FDI stock. Anwar and Afza (2014) attempted to determine the relationship of governance indicators including voice and accountability, political stability, government effectiveness, regulatory quality, control of corruption and governance index with inflows of foreign direct investment in Pakistan for the period of 1996 to 2010 through applying ARMA and Ordinary Least Squares regression techniques. The results of the study have shown that governance indicators have a positive relationship with FDI inflows in Pakistan.

However, it is difficult to find literature on the relationship between FDI inflows and governance indicators in Sri Lanka. Further, there is a huge debate about the political stability and the governance of the country. Thus, there is a high need to observe whether there is a substantial relationship between FDI inflows and governance indicators of the country.

Objectives

The key objective of the research is to determine the relationship between FDI inflows and Governance Indicators of Sri Lanka. Secondly, it aims at investigating the influence of governance indicators when determining the FDI inflows in Sri Lanka.

Methodology

This study is based on the time series secondary data for the period 1996 to 2017 covering 21 years. Data have been collected from the World Bank Development Indicators Database. The research approach adopted is to run a unit root test to check the stationary of data. It was expected to apply OLS regression model in order to determine the impact of governance indicators including government effectiveness and regulatory quality on inflows of FDI in Sri Lanka. The following regression model was estimated:

$$FDI = \beta_0 + \beta_1 GE + \beta_2 RQ + u$$

Where:

FDI = Net inflows of foreign direct investment in US$

GE = Government Effectiveness

Estimate gives the country's score on the aggregate indicator, ranging from approximately -2.5 to 2.5.

RQ = Regulatory Quality

Results and Discussion

According to the descriptive statistics, the mean of the FDI net inflows for the period is 568838702.6 US $. The mean values of Government Effectiveness and Regulatory Quality remain negative (Table 1). Research employed Augmented Dickey-Fuller test to check the stationary of data. According to the unit root test, the variables like FDI net inflows, Government Effectiveness and Regulatory Quality are stationary at level. Thus, research applied a OLS regression model on the variables such as FDI net inflows, government effectiveness and regulatory quality. The estimated model is as follows,

$$FDI = \beta_0 + \beta_1 GE + \beta_2 RQ + u$$

$$FDI = 7.32 + 1.30GE - 5.62RQ$$

According to the estimated model the coefficient of government effectiveness is statistically significant. It indicates the positive correlation with the FDI net inflows. Further, it reveals the significant influence of government effectiveness on FDI net inflows. The coefficient of Regulatory Quality is insignificant (Table 2). The value of the Jarque-Bera normality test indicates the normal distribution of the residuals. The VIF value of the model is less than 10, thus the model is free of multicollinearity. The Durbin-Watson statistic reveals the positive autocorrelation of the model (Table 2).

Table 1: Descriptive statistics

	Mean	St. Deviation
FDI net inflows	568838702	359669573
Government Effectiveness	-0.1663	0.1223
Regulatory Quality	-0.0947	0.1979

Table 2: OLS Regression estimates

Variables	Coefficient	St. error	t. statistic	Prob.	VIF
GE	1.30	6.08	2.13	0.049	1.03
RQ	-5.62	3.76	-1.50	0.154	1.03
Constant	7.32	1.34	5.48	0.000	
R-Square	0.3371	Adj.R-square	0.2542		
Durbin-Watson	0.6659	Jarque-Bera N test	0.1977		
F-Statistic	4.07	Prob(F-Statistic)	0.0373		

Conclusion

The purpose of this study was to determine the relationship of governance indicators with inflows of FDI in Sri Lanka for the period 1996 to 2017. Research concludes that there is a significant influence of government effectiveness on FDI inflows in Sri Lanka. Thus, government effectiveness should be considered in policy formulation for attracting greater inflows of FDI. The influence of regulatory quality on the FDI net inflows is not significant. Based on the findings of this study, the policy makers and regulatory authorities should take some effective measures to improve the condition of government effectiveness in order to strengthen the confidence of

domestic and foreign investors and to increase inflows of foreign direct investment in Sri Lanka since without improving government effectiveness, it may not be possible to provide a better business environment and to attract overseas investors.

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Examining the Inter-temporal Dynamic Relationship between Inflation and Volatility of Inflation: Evidence from Sri Lanka

P. Shobini and S. Sivarajasingham

Deptatment of Economics & Statistics, University of Peradeniya, Sri Lanka

***Keywords**: Inflation; Volatility; Dynamic; Sri Lanka*

Introduction

Knowledge about the linkage between inflation and inflation variability (uncertainty) plays an important role in decision making of economic agents. Inflation volatility/uncertainty distorts decisions regarding future saving and investment due to reduced predictability of the real value of future nominal payments; further, it also extends the adverse effects of these distortions on the efficiency of resource allocation and the level of real activity (Fischer 1981; Golob 1993; Holland 1993). The welfare costs of inflation and inflation uncertainty are well documented in the literature. However, empirical evidence on the link between the two is sparse in the case of Asia and Sri Lanka in particular.

Inflation is defined as a persistent increase in the general price level, while inflation uncertainty refers to a situation in which future prices are unpredictable and the public does not know whether inflation will increase or decrease in the future. The existence of a positive association between the level and variability of inflation has been widely accepted in the literature (Okun, 1971; Logue and Willet, 1976; Foster, 1978; Taylor,1981). The link between inflation rate and inflation uncertainty attracted more attention by theoretical and empirical macroeconomists following the Nobel lecture of Friedman (1977). Friedman's (1977) and Ball's (1992) hypothesis say that higher inflation invokes more inflation uncertainty. In contrast, Cukierman and Metltzer's (1986) hypothesis is that higher inflation uncertainty leads to more inflation.

Friedman (1977) says that high inflation will create political pressure to reduce it, but policy makers may fear recessionary effects and be reluctant to lower

inflation, resulting in future inflation uncertainty. He argued that increased variability of inflation distorts relative prices and adds an additional risk to long term contracting. However, the issue of liaison between inflation and inflation uncertainty is still debatable. Cukierman and Meltzer (1986) showed that increased uncertainty about money supply and inflation raises the optimal inflation rate set by policymakers. Holland (1993) thinks that inflation uncertainty arises due to the unknown size of the change in price level because of a certain change in money supply. Nevertheless, studies are scarce about the relationship between inflation and inflation uncertainty in developing countries including Sri Lanka. Therefore, this study attempts to examine the whether there exists any significant relationship between inflation & inflation uncertainty in Sri Lanka. The findings of the study can have a number of policy implications for trade, monetary policy.

Objectives

The main objective of the study is to examine the relationship between inflation and inflation uncertainty in Sri Lanka in-depth. The specific objectives are to verify Friedman–Ball hypothesis and to verify Cukierman-Meltzer inflation uncertainty hypothesis.

Methodology

This study uses the Consumer Price Index (CPI) to estimate inflation and its volatility. Data span January 2003 to December 2017 from the Department of Census and Statistics (DCS), Sri Lanka. Price inflation and volatility of inflation is derived from the overall CPI. Inflation is defined as log differenced of CPI ($\pi_t = [\ln(CPI_t) - \ln(CPI_{t-1})]*100$). Absolute Inflation, Squared Inflation, and conditional variance of inflation generated by the FIGARCH model are used as proxies for volatility of inflation. Stationarity properties of the series are examined using standard unit root tests. This study uses two approaches to examine the linkages; viz. graphical method and inferential method. First, we employ scatter plot with confidence ellipse with Kernel regression to visually inspect the association between inflation and its volatility. The second is Granger causality test.

Results and Discussion

In Figure 1, the scatter plot with confidence ellipse shows the underlying dynamic inter-relationship between inflation and inflation volatility dynamics over time. The overall shape of the confidence ellipse indicates that these variables are positively correlated. The kernel fit (non-parametric regression) indicates that the dynamic relationships are nonlinear and positive.

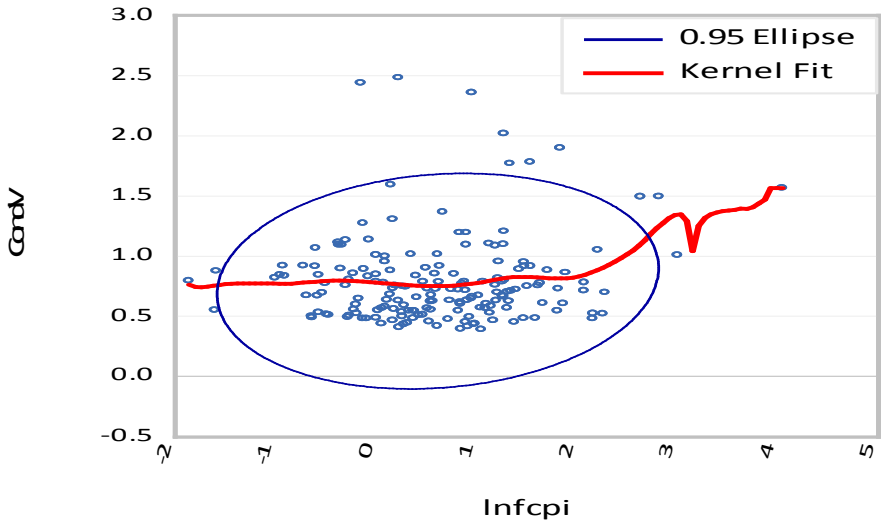

Figure 1: Association between inflation and inflation uncertainty

Table 1: Unit-root test results

Variable	Level with intercept Test statistic		Order
	ADF	PP	
Inflation	-9.321 (0.000)	-9.325 (0.000)	I(0)
Absolute inflation	-10.066 (0.000)	-10.304 (0.000)	I(0)
Squared inflation	-11.345 (0.001)	-11.932 (0.000)	I(0)
CV-GARCH	-3.552 (0.007)	-3.552 (0.000)	I(0)
CV-FIGARCH	-3.510 (0.008)	-3.876 (0.003)	I(0)

Note: P value is given in Parenthesis"( )". Variable* indicates stationary at 5% level of significance, Cv- Conditional Variance.

Simple statistical contemporaneous correlation analysis confirms that there is a weak positive correlation between inflation and inflation volatility (0.124). Unit-root test results (Table 1) indicate that both tests of ADF and PP reject the unit root null hypothesis. CPI series are stationary at their level. The p–value for the corresponding test statistic for each case is less than 0.05. These results suggest that variables are stationary series. Therefore, inflation series and the volatility series are stationary series. Empirical results of bivariate Granger causality analysis are reported in Table 2. The *p*-values of the *F* test statistics for the null hypothesis that inflation does not Granger cause uncertainty indicates that the null hypothesis is rejected at 5 percent significance level. Hence, inflation series Granger causes its own volatility of inflation series. Thus, the findings of the study support the Friedman-Ball hypothesis. However, Cukierman- Meltzer (1986) hypothesis, "Inflation uncertainty affects inflation", is not supported by the Granger causality analysis. In sum, the results are supportive to the Friedman- Ball hypothesis.

Table 2: Causality between variables

Null hypothesis	F statistics	P value	Decision
Inflation does not Granger cause ABSINF	4.463	0.036	Reject H_0
ABSINF does not Granger cause Inflation	0.016	0.870	Accept H_0
INF does not Granger Cause CV-GARCH	2.497	0.044	Reject H_0
CV-GARCH does not Granger Cause INF	0.473	0.755	Accept H_0
INF does not Granger Cause Squared inflation	3.275	0.040	Reject H_0
Squared inflation does not Granger Cause inflation	1.145	0.320	Accept H_0
LNFCPI does not Granger Cause CONDV	65.651	6.E-21	Reject H_0
CONDV does not Granger Cause LNFCPI	1.012	0.365	Accept H_0

Conclusion

This paper examines the relationship between inflation and its volatility using monthly data of CPI in Sri Lanka. In sum, the results support the Friedman-Ball hypothesis. The results of the study could help policy makers to formulate

policies to control inflation so that inflation uncertainty can be minimized. The Central Bank of Sri Lanka should try to stabilize the inflation rate in the face of inflationary shocks. The results of the study are consistent with the results of Gilbert and Morgan (2010) who say that price levels and price volatilities are likely to be positively associated.

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The Effect of Macroeconomic Determinants on Capital Flight in Sri Lanka

G. D. N. M. Godagampala and S. Vijesandiran

Department of Economics and Statistics, University of Peradeniya
Sri Lanka

Keywords: *Capital Flight, Macroeconomic Factors, VECM, Causality Test*

Introduction

Capital flight is one of the most important problems for developing countries which often lack the necessary financial resources to promote growth and development. Capital flight is a large-scale exodus of financial assets and capital from a nation due to events such as political or economic instability, currency devaluation or the imposition of capital controls. The UK Overseas Development Institute (ODI) defines capital flight as "the outflow of resident capital which is motivated by economic and political uncertainty." Capital flight can impose a severe burden on poorer nations since the lack of capital impedes economic growth and may lower living standards. The challenge posed by capital flight have always engaged attentions of policymakers, economists and the government in Sri Lanka. It denied the country of enormous resources which would have been used to promote the rate of economic growth and improve the welfare of its citizens.

Capital flight causes various serious negative consequences on the domestic economy of any country. Momodu, (2006); Onwioduoki, (2001); Ajayi, (1995); and Razin and Sadika, (1991) identified such consequences by incoperating reduction of domestic tax base, reduction of domestic investment, reduction of monetary control, destabilization of interest rate, underdevelopment of domestic economy, and reduction of per capita income into the model. Other consequences of capital flight is that capital 'flighted' never comes back, it skews income distribution, and drives up the marginal cost of foreign borrowing. Based on the above, Ajayi, (1997) states that income and wealth created and held abroad are outside the purview of the domestic authorities, and cannot be taxed. Capital flight hampers domestic

revenue, depresses the incentive to save, inflicts welfare losses, discourages investment, causes inability to service debts, leads to overshooting of the exchange rate, and contributes to imbalances of trade.

Several studies have been carried out on capital flight worldwide; however, a few studies have focused on the causal factors, measurements, and macroeconomic determinants of capital flight in developing countries. The magnitude of the impact of macroeconomic varieables on capital flight is given less priority. Thus, this study is an attempt to fill this gap considering the capital flight issues of Sri Lanka.

Objectives

Based on the above empirical and theoretical evidence this study intends to examine the effect of macroeconomic determinants on capital flight in Sri Lanka employing econometric techniques for empirical analysis. The study is aimed at providing the tools for policy making to reduce capital flight in other developing and third world countries.

Methodology

The study is designed to focus on macroeconomic determinants influencing capital flight in comparison to Gross Domestic Product (GDP) as a proxy to Economic Growth, Capital Stock as a proxy to investment (INT). Inflation (INF)) and Unemployment (UMP) are the selected macroeconomic (independent) variables and Capital Fight (CF) is the dependent variable. The study covers the period from 1990 to 2017 and uses secondary time series data from the World Bank database and Central Bank of Sri Lanka. The theoretical form of the functional econometric model of this study is given below:

$$CF_t = \delta_0 + \delta_1 GDP_t + \delta_2 INT_t + \delta_3 UMP_t + \delta_3 INF_t + u_t \qquad (1)$$

Where, $\delta_0, \dots\dots, \delta_3$ are coefficients of determinant variables; $u_t$is error term and t is time factor. The study adopted Augmented Dickey Fuller (ADF) unit root test method to test the order of integration of variables and Akaike Information Criterian (AIC) was adapted to determine the optimal lag length of each series. The Johansen Co-integration method and Pairwise Granger Causality approach is adopted to investigate the relationship between the variables and the effects of macroeconomic determinants on CF. Error

Correction model (ECM) mechanism is adopted to determine the short run dynamics and long run adjustment of variables. These test were conducted through E- views econometric software.

Results and Discussion

ADF unit root test confirmed that all variables are stationary in their first difference I(1). Based on the appropriate Lag length structure, we adapted the lag order (1) for the model to estimate the parameter. The trace and maximum eigenvalue test indicates two co-integrating relationships thus revealing the presence of a long run relationship among the variables CF, GDP, INT, UMP and INF during the period under reference (See Table 1).

Table 1: Unrestricted Co-integration rank test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.9782	167.718	69.818	0.0000
At most 1 *	0.7654	71.971	47.856	0.0001
At most 2 *	0.6654	35.721	29.797	0.0092
At most 3	0.2753	8.345	15.494	0.4292
At most 4	0.0116	0.292	3.841	0.5885

Since there are two co-integrating vectors, an economic interpretation of the relationship between capital flight, gross domestic product, investment, unemployment and inflation can be obtained by normalizing the estimates of the unconstrained co-integrating vector on capital flight. The results of long run relationships are given below in equation

$$\widehat{\mathrm{CF}}_t = 5.25\mathrm{e}^{+10} - \underset{(2069691)}{43336398}\mathrm{GDP}_t + \underset{(0.26033)}{3.62}\mathrm{INT}_t + \underset{(2.9e^{+7})}{5.42\mathrm{e}^{+8}}\mathrm{INF}_t - \underset{(6.8e^{+7})}{1.74\mathrm{e}^{+9}}\mathrm{UMP}_t \qquad (2)$$

Note: Standard errors are given in parentheses

The parameters of long run equation are presented in Equation 1 shows a negative and statistically significant relationship between economic growth

and capital flight. Investment and the inflation rate are positively related to capital flight; and the unemployment rate is negatively related with capital flight.

Table 2: Vector error correction mechanism

Variable	Coefficient	Std.Error	t-Statistic	Decision
ECM (-1)	-0.062	(0.313)	[-0.197]	Insignificant

The ECM Outputs shown in Table 2 indicate that the speed of adjustment to equilibrium is negative which confirm the theoretical relationship among concerned variables. Further, the error correction model coefficient -0.062 is rightly signed but not statistically significant at 5% level. It indicates that just about 6 % of the disequilibrium or distortion in the Sri Lankan economy is yearly being corrected for, though slowly due to the low coefficient of the ECM term. The existence of co-integration relationships indicates that a long-run equilibrium relationship exists between capital flight, economic growth, investment, inflation and unemployment in Sri Lanka.

Table 3: Results of the short run relationship

Variables	Lag (0)	t- Statistic	Lag (1)	t- Statistic
D(CF)			-0.2522	[-0.574]
D(GDP)	-4.38E-09	[-0.498]	24119	[1.640]
D(INT)	-0.284790	[-2.938]	-0.3380	[-0.345]
D(INF)	-8.68E-10	[-1.251]	3958	[0.325]
D(UNMP)	8.31E-11	[0.859]	-6.2E+08	[-0.518]

According to Table 3, UNMP has positive impact on CF in short run. That is an increase in the unemployment rate is more likely to increase the capital flight. However this impact is not statistically significant. Even through GDP, INT, and INF affect the CF negatively, only the effect of INT is statistically significant. This could be because, capital flight leads to the loss of resources as capital is transferred abroad. This removal of domestically available resources directly alters the desire for domestic investment by individuals and thus the level of aggregate domestic investment.

The granger causality test results suggest unidirectional causality that runs from gross domestic product to capital flight; inflation to gross domestic product and from gross domestic product to investment within the period under reference. The economic implication of unidirectional causality from GDP to CF at 10 % level of significance is that a rise in gross domestic product leads to increases in the volume of funds taken out of the economy through capital flight.

Table 4: Extracted output of Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause CF	26	3.462	0.05
INF does not Granger Cause GDP	26	5.991	0.00
GDP does not Granger Cause INT	26	10.199	0.00

This result reveals that a fall in economic growth leads to increase the capital flight outflow; it induces the investor to take their investment back and money will move out of the country. The coefficient of investment and the inflation rate are positively related to capital flight which indicates that the higher investment and inflation in the country would result in increasing capital flight. Unemployment rate is negatively related with capital flight which indicates that a lower unemployment rate increases the wages and labour shortage among skilled labor; in turn both increase the labor cost of an investment, thus inducing labor flight through the investors moving their investment to a country where the labor is cheaper.

Conclusion

The challenges posed by capital flight have always engaged attention of economists, policy makers, and successive governments in Sri Lanka because it has denied the country of enormous resources which could have been used to accelerate the rate of economic growth and improve the welfare of its citizens. This study attempted to examine the effects of macroeconomic determinants on capital flight in Sri Lanka using a co-integration and causality approach. It is concluded that there is a causal relationship between macroeconomic factors; i.e inflation, unemployment, capital stock, economic

growth and capital flight in Sri Lanka. Therefore, the Government needs to frame effective macroeconomic policies and strategies in order to manage inflation and interest rates at desirable levels; create an enabling environment to accommodate a higher level of capital stock through new investment; provide cheap labor with skill capabilities; uninterrupted sustainable economic growth process which could keep continuously the foreign investment for the longer period without capital flight. As much as possible, expatriates and researchers should be engaged in further studies since knowledge is lacking in these areas.

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Causal Links between Trade Openness and Foreign Direct Investment: The Long-run and Short-run Analysis of Sri Lanka

R. M. M. Mayoshi and T. N. Vidanage

Department of Economics and Statistics, University of Peradeniya
Sri Lanka

Keywords: *Trade Openness; FDI; Development; Sri Lanka*

Introduction

In general, foreign direct investment (FDI) inflows play an increasingly strong impetus for economic development and progress of countries. It is considered as one of the major factors of growth in countries like Sri Lanka, India, and Bangladesh. According to Omisakin et.al. (2009), FDI serves as an important source of funds supply for domestic investment, thus promoting capital formation in the host country. FDI clearly brings investment finance and can contribute to employment. Technology and skills transfer, pioneering of new industries and export markets, formation of new clusters as anchor investors and creation of linkages with, and associated upgrading of competencies of local enterprises are perceived major benefits of FDI (United Nations Conference on Trade and Development, 2004). In the particular case of FDI inflow to Sri Lanka, it can play a major role in the economy. In 2017, net FDI inflows for Sri Lanka were 1,374 million US dollars, an increase from 193 million US dollars in 1998, growing at an average annual rate of 15.34% (Central Bank Annual Report, 2017).

There are many studies showing the relationship between FDI and trade openness for a number of counties. According to Sazali et.al. (2018) trade openness has a positive and significant impact on FDI in Malaysia. Liargovas and Skandalis (2012) found that trade openness contributes positively to the inflow of FDI in developing economies. Athukorala and Karunarathna (2004) found that the direction of causality was not towards FDI to GDP growth and the impact of domestic investment and trade liberalisation have a positive effect on GDP growth. Literature survey revealed the absence of studies on causal links between trade openness and foreign direct investment in Sri

Lanka; hence it is a very important area to reach a high economic growth position in the future.

Objective

The primary objective of this is to examine the causal relationship between trade openness and foreign direct investment in Sri Lanka.

Methodology

This study used trade openness as the main independent variable to examine the causal relationships between trade openness and foreign direct investment, with exchange rate and economic growth as control variables. Secondary data for the period of 1970 -2017 from the Central Bank of Sri Lanka and the World Bank were used for this study. This study was carried out based on a modified neoclassical Solow production function and employed multiple regression analysis. The regression model is developed as suggeded by Sazali et.al. (2018). The functional econometric model is expressed as follow:

$$FDI_t = \beta_0 + \beta_1 EXR_t + \beta_2 GDPP_t + \beta_3 TRP_t + u_t \qquad (1)$$

Where Foreign Direct Investment Inflows (FDI) is used an endogenous variable and the independent variables are Exchange Rate (EXR), GDP Per Capita (GDPP) and Trade Openness (TRP). Here, u is the error term and the subscript t indicates time. Trade openness can be defined as the level of trade which a country is permitted to do with the other country. It includes all kinds of trade linkages. We used the following trade openness formula:

$$TRP = \frac{IMR+EXP}{GDP}$$

Where, IMR- Import Good and Services (Current US$), EXP- Export Good and Services (Current US$), GPP- Gross Domestic Product (Current US$).

ADF unit root test were adopted to test the stationary property of data and the Autoregressive Distributed Lag (ARDL) model developed by Pesaran et al. (2001) was employed to find the long-run and short-run relationship, and long-run adjustment. Bound Tests approach was employed to investigate the existence of a long-run relationship among the variables. The unrestricted

error correction model was employed to test the the short-run dynamics of ARDL model.

Results and Discussion

The Augmented Dickey Fuller (ADF) test confirmed that all the variables are stationary at both level and difference of the variables. Akaike Information Criteria (AIC) suggested the use of ARDL (2, 1, 2, 0) model for this analysis.

Table 1: F -Test for the existence of a long run relationship

F-Bounds test	95% Level of Confidence		90% Level of Confidence	
F- Statistics	Lower Bound	Upper Bound	Lower Bound	Upper Bound
18.97	2.79	3.67	2.37	3.2

In Table 1, calculated F-statistic = 18.97 is higher than the upper bound critical value at 5% level of significance (3.2). Since we confirmed the cointegrating relationship between the variables through the Bounds test, we estimated the long-run relationship among the variables via the ARDL model.

Table 2: Long- run coefficient estimates

Constant	EXR	GDPP	TRP	R^2
-1.601	-515920	1328.77	2.66E+08	0.960
(0.0390)**	(0.0422)**	(0.0000)***	(0.0313)**	

Note: P- values are given in parenthesis. *, **, *** show significance at 1%, 5% and 10% level, respectively.

According to the regression results, the explanatory variable explained approximately 96 per cent of the variation in foreign direct investment inflow in Sri Lanka. As expected by theory and most of the literature (e.g., Athukorala and Karunarathna, 2004; Sazali et.al. 2018) all independent variables in the model are significant implying that variables affect the dependent variable, Foreign Direct Investment Inflows (FDI). Moreover, TRP and GDPP have a positive effect and EXR has a negative effect on Foreign Direct Investment Inflows in the long-run, implying that favourable economic growth and trade openness are advantageous but exchange rate is not advantageous for foreign direct investment inflow in Sri Lanka.

Table 3: Short-run coefficient estimates and error correction representation

Lag Order	ΔFDI	ΔEXR	ΔGDPP	ΔTRP	ETC(-1)
0		-5468665	4682.63	3.610	-0.355
		(0.000)*	(5.381)*	(0.000)*	(-10.254)*
1	0.574		3806.249		
	(5.236)*		(4.088)*		

Note: t-statistics are given in parenthesis. *, **, *** show significant at 1%, 5% and 10% level respectively and test statistics are given in the parenthesis.

Accordingly, as expected, ETC (-1) carries a negative sign, which is highly significant, indicating that there should be an adjustment towards steady state line in the long run equilibrium at the speed of 35.5 % one period after the exogenous shocks.

Conclusion

The results of this study have shown that trade openness, which was the main variable, has a short-run and long-run relationship with FDI inflows in Sri Lanka. All three independent variables in this model, namely, exchange rate, economic growth, and trade openness have statistically significant relationships with FDI inflows in Sri Lanka. This finding is consistent with Sazali et.al. (2018) who investigated the causal links between trade openness and foreign direct investment in Malaysia. Therefore, this study has concluded that a good combination of these independent variables will attract more inflows of FDI into Sri Lanka. But exchange rate appears to discourage FDI inflows in short-run in Sri Lanka. These findings imply that strong open trade policies can help promote FDI inflows to Sri Lanka. In addition, this study had only included three independent variables. In order to have a more conclusive answer, future research should include more independent variables, such as market size, inflation rate, wage rate, and human capital and political instability.

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An Analysis of Household Demand for Major Food Items in Urban, Rural and Estate Sectors of Sri Lanka

N. J. C. Paraneetharan[1], J. Nigel[2] and T. Vinayagathasan[3]

[1]PGIHS, University of Peradeniya, Sri Lanka
[2, 3] Department of Economics and Statistics, University of Peradeniya Sri Lanka

Keywords: *MLA/AIDS; Price Index; ISUR; Expenditure Elasticity*

Introduction

The analysis of food demand has received increased attention world-wide in the last few decades ever since food intake was found to have a strong empirical linkage with human health and labour productivity (Aromolaran, 2004). The estimated price elasticity of demand and income or expenditure elasticities of demand are regarded as important tools for policy design and planning. The study of food consumption patterns is crucial in Sri Lanka, which is categorized as a Food-Deficit country by FAO. In Sri Lanka, consumption expenditure contributed more than 70% of GDP (Economic and Social Statistics, 2018). However, it contributed only 38% of the total expenditure shares of an average household (HH) (Consumer Finances and Socio-Economic Survey, 2003/04). The HHs living in urban, rural and estate areas make expenditure on different commodities to attain their day to day requirements. The overall HH demand for food in Sri Lanka has been well documented. But, there no adequate study exists on HH demand for food based on sectoral wise using Sri Lankan data. Thus, the present study by complementing the existing HH demand for food studies, attempts to bridge the existing gap.

Objectives

The main objective of the study is to estimate consumer demand using expenditure elasticity and compensated price elasticity for the main groups of food in the urban, rural and estate sectors.

Methodology

This study used data from HIES surveys of 2016, 2012/13, 2009/10 and 2006/07 in the districts of Badulla, Kandy, Nuwara-Eliya and Ratnapura where a minimum of 5% of population lived in each of the three sectors. The total sample size was 13,881 HHs that covered urban - 2010; rural – 8508; estate - 3363 based on the two stage stratified sampling method of Neymann allocation. The survey conducted over a period of 12 consecutive months recording weekly consumption of 112 food items were selected according to the 10 main food groups namely rice, wheat flour, bread, pulses, coconut, meat, fish, milk & milk products, egg and vegetables. Weighted average prices were estimated for each of the main food groups.

In this study, the Modified Linear Approximation of the Almost Ideal Demand System (MLA/AIDS) was selected as the basic model for the aggregated complete demand system estimation due to its flexible functional form and nimbleness in estimation. In a short and snappy way the demand function of MLA/AIDS in budget share form can be expressed as:

$$W_i = \alpha_i + \sum_j \gamma_{ij} \ln(p_j) + \beta_i \ln\left(\frac{x}{P^L}\right) \quad (1)$$

Where, the major food groups $i = 1\ldots\ldots 10$, W_i = budget share of food of each group i, p_j = price of food group j, x = household's monthly total food expenditure, P^L= Laspeyres price index, α_i, β_i and γ_i are estimated parameters. The expenditure and compensated price elasticities can be then derived respectivey as follows from the above equation:

$$\eta_i = 1 + \left(\frac{\beta_i}{w_i}\right) \quad \text{Expenditure elasticity} \quad (2)$$

$$\varepsilon_{ij} = -\delta_{ij} + \left(\frac{\gamma_{ij}}{\overline{w_i}}\right) + \overline{w_j} \quad \text{Compensated price elasticity} \quad (3)$$

Where δ_{ij} is the Kronecker delta that is equal to one if $i = j$ (own price), and zero for $i \neq j$ (cross price). In this study, the sample mean is used for the point of normalization. Iterative Seemingly Unrelated Regression (ISUR) method of Zellner is used to estimate the parameters.

Results and Discussion

Overall significance of demand models of every food group under each sector was checked by using Zellner's ISUR. The result found that almost all food groups in all sectors are significant and a reasonable number of estimated coefficients of the explanatory variables are also significant. So, the use of MLA/AIDS model for aggregate food consumption analysis is found to be appropriate to this study.

Table 1: Expenditure elasticity of food groups (2006 - 2016)

Sector	Rice	WF	Bre	Pul	Veg	Meat	Fish	Egg	Coc	Milk
Urban	0.87	0.84	0.20	0.95	0.81	1.10	0.48	0.55	0.78	0.81
Rural	0.82	0.72	0.46	0.82	0.78	1.15	0.87	0.38	0.81	0.86
Estate	1.06	0.76	0.71	1.10	0.79	1.56	1.00	0.96	0.76	0.41

The results of Table 1 reveal that, as expected to theory and some of the existing empirical studies (eg. Chikobola *et al.* 2016; Ahmad *et al.* 2015), the expenditure elasticities of demand for the selected main food groups are relatively high in all three sectors. Expenditure elasticity for wheat flour, bread, vegetables, egg, coconut and milk food items are categorized as normal and necessary goods in all sectors. Meat is categorized as luxury food group in all three sectors, while rice, pulses and fish food items considered as luxury foods in estate sector.

Table 2: Compensated own price elasticity of food groups (2006 - 2016)

Sector	Rice	WF	Bre	Pul	Veg	Meat	Fish	Egg	Coc	Milk
Urban	-0.66	-0.24	-1.06	-0.49	-0.63	0.70	0.52	0.40	-0.43	-0.10
Rural	-0.70	-0.86	-0.82	-0.40	-0.68	1.09	0.39	0.29	-0.71	-0.26
Estate	-0.52	-2.91	-1.05	-0.58	-0.60	1.34	0.55	0.20	-0.75	-0.80

Table 2 reveals that as expected by theory and some of the existing empirical studies (eg. Chikobola *et al.* 2016; Ahmad *et al.* 2015), compensated own price elasticity of demand for rice, pulses, vegetables, fish, egg, coconut and milk food items are inelastic in all three sectors which indicates that the consumers are insensitive to own price changes. But wheat flour, bread and meat in the estate sector, bread in the urban sector, and meat in the rural sector are considered to show elastic demand. Thus price changes affect the demand for the food item in a greater extent as compared to the other food groups. Table 3 reveals that for example, rice is categorized as substitutes for wheat flour,

bread, pulses, vegetable, fish, egg and coconut food items, while meat and milk food items are classified as complements in urban sector. It is also noted that bread-rice and egg-bread cross-price elasticities depict the substitute effects and fish-milk shows the complement effects which are very high in urban sector.

Table 3: Compensated cross price elasticity in urban sector (2006 - 2016)

	Rice	WF	Bread	Pulse	Veg	Meat	Fish	Egg	Coc	Milk
Rice		0.63	1.04	0.03	0.05	-0.15	0.33	0.12	0.02	0.12
WF	0.10		-0.61	-0.08	-0.05	-0.02	0.01	-0.80	0.05	-0.24
Bre	0.14	-0.49		0.04	0.04	-0.45	-0.21	1.14	-0.08	-0.38
Pul	0.00	-0.12	0.08		0.01	0.01	-0.01	0.10	0.02	-0.02
Veg	0.03	-0.21	0.23	0.03		-0.14	0.21	0.01	0.23	0.07
Meat	-0.02	-0.02	-0.53	0.01	-0.03		-0.04	-0.55	-0.12	0.21
Fish	0.05	0.01	-0.26	-0.00	0.05	-0.04		0.07	-0.06	0.09
Egg	0.00	-0.28	0.49	0.02	0.00	-0.20	0.02		-0.07	0.06
Coc	0.00	0.11	-0.21	0.03	0.12	-0.26	-0.12	-0.39		0.00
Milk	-0.10	0.20	0.42	-0.02	0.01	0.14	-1.14	-0.53	0.0	

Table 4: Compensated cross price elasticity in rural sector (2006 - 2016)

	Rice	WF	Bread	Pulse	Veg	Meat	Fish	Egg	Coc	Milk
Rice		0.52	-0.28	0.27	0.11	-0.54	-0.25	0.19	0.19	0.11
WF	0.08		0.28	-0.01	-0.03	-0.17	-0.16	-0.23	-0.00	0.16
Bre	-0.04	0.22		-0.08	0.09	0.20	-0.03	-0.35	0.06	-0.10
Pul	0.07	-0.01	-0.15		0.04	-0.45	0.03	0.06	0.00	0.05
Veg	0.07	-0.12	0.47	0.10		-0.38	0.04	-0.03	0.12	0.04
Meat	-0.08	-0.16	0.23	-0.27	-0.08		0.23	-0.28	0.05	-0.06
Fish	-0.04	-0.17	-0.03	0.02	0.01	0.25		-0.04	-0.02	0.16
Egg	0.01	-0.08	-0.15	0.01	-0.00	-0.10	-0.01		0.00	-0.21
Coc	0.06	-0.01	0.15	0.00	0.06	0.10	-0.04	0.00		0.09
Milk	0.13	0.26	-0.11	-0.06	0.04	-0.46	-0.62	-0.02	-0.12	

The results of Table 4 illustrate that, for example, wheat flour group has a substitute effect with rice, bread and milk food items whereas pulses, vegetable, meat, fish, egg and coconut food items show complement effects in rural sector.

Table 5: Compensated cross price elasticity in estate sector (2006 - 2016)

	Rice	WF	Bre	Pul	Veg	Meat	Fish	Egg	Coc	Milk
Rice		0.35	0.70	0.26	0.18	0.50	-1.03	-0.86	0.07	0.15
WF	0.06		1.42	0.26	-0.11	0.24	0.38	-0.76	0.01	-0.24
Bre	0.09	1.15		-0.07	-0.02	-0.64	-0.25	0.53	0.20	0.00
Pul	0.07	0.41	-0.14		0.01	-0.47	-0.24	0.19	0.09	0.45
Veg	0.12	-0.42	-0.11	0.04		-0.37	0.11	0.58	0.11	1.02
Meat	0.08	0.23	-0.74	-0.29	-0.09		-0.00	-1.03	-0.30	0.10
Fish	-0.18	0.38	-0.31	-0.15	0.03	-0.01		-0.23	-0.03	0.20
Egg	-0.05	-0.26	0.22	0.04	0.05	-0.38	-0.08		0.09	-0.69
Coc	0.02	0.02	0.49	0.12	0.05	-0.63	-0.06	0.56		0.01
Milk	-0.07	0.65	-0.89	-0.05	0.07	-0.00	0.21	0.39	0.06	

The results of Table 5 demonstrate that, for example, vegetable group has complementary relationships with wheat flour, bread and meat food items while substitution relationships exist with rice, pulses, fish, egg, coconut and milk food items. It is noted that wheat flour-bread, bread-wheat flour, milk-vegetable substitution effects and fish-rice and egg-meat complementary effects are very high in the estate sector.

Conclusion

The findings of price and expenditure elasticities of demand for the selected food groups could be used in projections for future food consumption. The high price elasticities of demand for many food items stress the importance of food price changes for households especially in the estate sector, and their reactions should be taken into account in the development of comprehensive agricultural and food policies in order to avoid unanticipated effects harming consumers. It is important that a number of different food sources be consumed and efforts should be made to encourage a wide variety of foods to improve the nutritional quality of diet and health of the population. Dietary diversity is one of the most important ways to ensure a balance of nutrients for people of all ages. The results of this study suggest that income oriented policies are important to achieve better nutrition and reduce the problem of unbalanced diets. In addition, complementing policies are necessary.

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Challenges of Social Inclusion of the Visually Impaired and Blind Persons in the Sri Lankan Workplace

T. Suraweera and V. R. Dunuwila

Faculty of Computing, Sri Lanka Institute of Information Technology Sri Lanka

***Keywords**: Social Inclusion; Visual Impairment; Blindness; Workplace*

Introduction

People with visual impairment and blindness (VI&B) represent the majority of the differently abled population in most communities (WHO, 2011) where social inclusion in the workplace has always been a challenge. They are more likely to be overly sympathized, negatively viewed or even teased which results in them being excluded from society (Zainol et al., 2018). Social inclusion of diverse communities is a key element of social sustainability coming under UN Global Compact principles. Thus, a high priority has been given to studies dealing with social inclusion, which include the improvement of orientation & mobility and social acceptance aimed at empowering employees with VI&B. This paper focuses on the challenges associated with social inclusion encountered by the employees with VI&B in the workplace.

Employees with VI&B do not enjoy full integration in the workplace due to the lack of social support. Inability to navigate through social venues, failure to recognize co-workers, inability to obtain food and drink without assistance and the need to rely on colleagues for assistance are some of the barriers that exclude them from socializing (Naraine & Lindsay, 2011). Alma et al. (2012) highlight personal value attached to participation and the size of their social network as major determinants of social inclusion, while factors such as self-perceived vision and degree of visual impairment has no relationship to social inclusion of the visually impaired adults. Thus, it is imperative to investigate the issues of social inclusion of employees with VI&B for implementing new policies, support services and intervention programs towards enhancing their social inclusion (Hagiliassis et al. 2014) and in turn to guarantee social sustainability.

Objectives

The research problem emanates from the fact that although social inclusion of persons with VI&B is a priority area, no systematic investigation has been carried out on the social inclusion of employees with VI & B in the Sri Lankan organizations. Thus, a serious knowledge gap exists in this area. The objective of this study is to explore the extent to which the Sri Lankan workplace provides a conducive environment for the employees with VI&B. In particular, the key challenges associated with their orientation & mobility and social acceptance are determined.

Methodology

Due to the exploratory nature of this research, a qualitative approach has been adopted. The study population comprises of medium to large scale organizations in Sri Lanka. The data collection method adapted was mainly in-depth interviews where seven blind respondents consisting of four males and three females of executive grades were selected using the snowball sampling technique. Each of these respondents represented organizations with a broad range of sophistication with respect to functionality, which included a state university, a top banking institution and an AG's office, whose names are not disclosed for confidential reasons. The interviews were conducted on a face-to-face mode and over the phone, based on a pre-determined interview protocol which lasted for 45 to 60 minutes and the proceedings were recorded and transcribed. Using pattern matching and thematic analysis techniques, data so gathered were analyzed to elucidate the key challenges encountered and factors that would facilitate improved social inclusion.

Results and Discussion

Five main challenges with respect to orientation & mobility and social acceptance came to light and one of the key determinants that stimulates higher levels of social inclusion was also found. The key findings are summarized below:

a) *Inadequate Infrastructure Support:* Most organizations in the sample have almost no facilities to support physical accessibility of employees with VI&B, and hence they face many difficulties with respect to orientation and mobility. None of the organizations have taken any interest to address

the issues of mobility from the employees' place of residence to workplace. Personal safety is left at risk and accidents have also been reported in certain places. Only one private sector organization provides a VI&B friendly environment which includes guiding floor tactiles, trailing bars, and guiding stickers, braille markings in lifts, embossed stickers and voice-support in elevators. One of the largest public sector financial institutes in the sample has a standard layout on all floors so that employees with VI&B could locate the respective places reasonably well. In most institutions within the sample, people's support is admirable. Although, there are critical issues with respect to orientation and mobility for employees with VI&B, they seem to view them as 'the way it is' and tolerate to a very great extent.

b) Issues with respect to Social acceptance: All participants maintain very good social relationships with their colleagues in the workplaces where they felt that they are part of the team. Thus, social acceptance is not observed to be a major issue for employees with VI&B in all organizations studied. However, it is observed that the level of these relationships depends on the individual behavior of the person with VI&B and their orientation. Other employees seem to provide adequate support to the fellow workers with VI&B. There are instances where the support goes beyond the required level showing excessive sympathy, thus resulting in persons with VI&B feeling underrated.

c) Poor job design: In most state organizations there is a major mismatch of a person's specifications (including the skills) and the job design. For example, graduates with VI&B have been placed in executive positions where the main mode of information access is paper based hard copy file systems.

d) Inadequate workplace safety: Employees with VI&B face many problems when it comes to workplace safety, where repeated collision and accidents are taking place. No strategies and operational mechanisms promoting workplace safety are in place in most organizations within the sample.

e) Mismatch of focus: The emphasis placed on disability support in most organizations appear to be focusing toward people with physiological impairments rather than visual disabilities. In the two 'better' organizations, sharing information through electronic media is well

supported. However, common forms of information dissemination such as noticeboards are not accessible by employees with VI & B.

Conclusion

This study highlights five critical challenges encountered by employees with VI&B in the workplace. Orientation and mobility support is found to be a largely neglected area. No assistive technologies are practically used in the workplace to aid VI&B employees for their navigation and information sharing. Job redesign to promote a VI&B friendly workplace would facilitate the overall productivity of the organization. Although, social support at the individual level is prevailing in general, it is important to develop a disabled friendly mindset and attitudes of the other employees toward facilitating social inclusion of VI&B and to promote unity towards establishing social sustainability at large. In addition, the top management support has been recognized as a key determinant that facilitates social inclusion, in particular in the social acceptance arena.

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Stimulating Factors of Social Inclusion of Children with Visual Impairment and Blindness in Sri Lanka

T. Suraweera, T. Perera, P. Mihirangana, N. Rukmal and V. Senaviratne

SLIIT Business School, Sri Lanka Institute of Information Technology Sri Lanka

Key words: *Visual Impairment; Blindness; Social Inclusion; Children*

Introduction

Social sustainability entails the mutual co-existence of individuals, diverse communities and societies. Social equity, social capital, human rights, quality of life, education and social responsibilities are the main factors that promote social sustainability. Persons with Visual Impairment and Blindness (VI&B) represent the largest component of the disabled population in most communities. Education is observed as a key determinant that promotes social inclusion, in particular with respect to children. However, support towards educating children with VI&B is quite poor in the South Asian region including Sri Lanka. Although promoting education is vital for social inclusion, the question arises as to how far Sri Lanka is geared to improve the level of education of children with VI&B. Sri Lanka Government Census of 2012 indicates that 996,939 persons of the age of 5 years and above are blind, which comprises 4.7% male and 6.0% female children (Holmes et al., 2018).

Past research, conducted in the West in particular, has observed that visual impairment not only impact on individuals, but also their families, caregivers and community (Köberlein et al., 2013). Sachs and Schreuer, (2011) suggest that promoting education is an essential requirement for people with visual impaired and blind children. Even in the domain of higher education there are several barriers and challenges for people with VI&B. Children with VI&B has more prospects for securing employment which in turn gain strength to sustain themselves financially with self-possession. Vuletić et al. (2016) state that the parents of children with VI&B are very much concerned about the future of their child.

Taking the above into consideration a serious knowledge gap exists with respect to social and economic aspects of children with VI&B. On the other hand, research studies focusing on persons with VI&B and differently abled persons are common in developed countries but lacking in the developing countries including Sri Lanka. Thus, this research focuses on the factors that determine promotion of education of children with VI&B in Sri Lanka.

Objective

The main objective of this research is determine the factors that promote (or hinder) education of children with VI&B in the context of Sri Lanka.

Methodology

This research was qualitative and based on in-depth interviews. The target population of the study was Sri Lankan families having visually impaired and blind children. A detailed investigation into 10 families having children with VI&B was conducted using in-depth interviews and a further set of information related to 25 families having visually impaired and blind children were used to derive inferences through using the questionnaire. The study selected "Sandagala Special School" in Kurunegala and "Deaf and Blind Special School" in Rathmalana, to locate the children with VI&B. Narrative analysis technique were used to build insights based on in-depth interviews data collection.

Results and Discussion

The children's blindness levels vary from total to partial impairments, with high and low vision categories. Some of them attend state schools dedicated to Deaf and Blind children. The sample represented both genders. The analysis of interview data resulted in five key factors.

1. Blindness is not a barrier for learning: Most of the visually impaired and blind children in the sample demonstrated very strong academic rigor. For instance, the mother of one child indicated that her 'blind' daughter became the second highest from the blind students in Sri Lanka as well as 1st place from the North-West province. She had scored 173 marks for the scholarship exam and she received a President's award with a Rs.100, 000 gift voucher. This girl demonstrates excellent musical abilities and is a 'Visharads' diploma

holder for vocal skills. It is also interesting to note that she has high ambitions aiming to become a professor in future.

2. Parental Support, role of Friedman peers: Productive support of parents, siblings, teachers and friends significantly impact on children's welfare and development. The results show that positive intervention of parents, teachers and siblings can enhance a child's education. For example, one mother, despite being a science teacher had learnt the braille system to help her child's education. She had also changed her teaching location several times to be with her blind daughter, and had proven academic achievements. While certain other children also get support for their studies from this blind child, they positively support social inclusion. On the other hand there are cases of marginalization of children with VI&B which has resulted in depression and other emotional problems.

3. Role of dedicated 'Deaf and Blind' (D&B) schools: Exposure in D&B schools provide significant support at early stages of education, but continuing with them negatively impacts their social inclusion. The results suggest that VI&B children who go to D&B schools at their early stages of education show high performance in education compared to those going to normal schools. But it minimizes their association with students who are not VI&B.

4. *All children in the sample aspire to become teachers, and that may be due to limited exposure*. Findings showed that most of VI&B children's ambition is to be a teacher, because their teachers are visual impaired and blind. Therefore they think if they learn well they could easily become a teacher. This thinking possibly reflects their limited environment.

5. Financial Issues: Transportation cost is higher for families with children of VI&B. Furthermore, large sums of money have been spent on non-confirmed orthodox medicinal treatments with almost no success. This is a major issue with respect to parents' knowledge (level of education), ability to grasp reality and their vulnerability towards social and cultural misconceptions.

Most of the families having children with VI&B fall into the 'poor' social category and only some have reached middle-income level. Most of the parents are casual unskilled laborers. Some of them have no permanent job at

all. It was observed most families suffer from not having sufficient income to cover their daily needs.

Conclusion

This research presents very important key factors that influence social inclusion of children with VI&B. Poverty and poor knowledge (level of education), inability to grasp reality and their vulnerability towards social and cultural misconceptions play a key role in this respect. Education seems a key factor for children with VI&B to make headway for improved social inclusion. Blindness is not a major barrier for learning if a conducive environment is provided. These findings also support the social theory of disability where the issues are not emanating from the person with VI&B, but is more a problem with society as whole.

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Loss of Manpower due to Road Traffic Congestion in Kandy City: A Comparison between Different Vehicle Users

M. Karunarathna[1], Y. M. Bandara[2], W. Athukorala[1] and R. Gangahagedara[3]

[1]Department of Economics and Statistics, University of Peradeniya Sri Lanka
[2]Department of Transport & Logistics Management, University of Moratuwa, Sri Lanka
[3] PGIHS, University of Peradeniya, Sri Lanka

Keywords: *Manpower; Traffic Congestion; Vehicle Users; Kandy*

Introduction

Traffic congestion is widely seen as a growing problem in many urban centers in Sri Lanka. The total vehicle population in the country has dramatically increased with an average annual growth rate of 6 % between 2008 and 2016 (Karunarathna, 2019). According to vehicle registration records of the Department of Motor Traffic, in peak hours, more than 3 million automobiles use road infrastructure all over the country. At present, while the total number of households in the country is 5.1 million, total number of vehicles in use is 6.4 million showing that the number of vehicle population is higher than the number of families (households) in the country. Of these, 50 % of automobiles are inbound to Colombo and Kandy while most of them are personally owned automobiles (Karunarathna, 2019). This growing trend in the vehicle population has important implications for Sri Lankan society, economy and the environment while creating severe traffic congestion in major cities.

The overall volume of vehicular traffic congestion continues to grow faster than the capacity of the urban road transportation system in the last decade. Road traffic congestion directly reduces productivity levels and adds additional costs to the total production cost in term of a loss of resources. It creates a huge loss of manpower as most commuters have to spend their productive time or leisure time on roads travelling. A few recent studies (Maparu and Pandit, 2010; Xu et al., 2013; Zhang et al., 2014) show that traffic

congestion leads to increase in the operating cost of vehicles, delay of the journey, increase in pollution and in stress. The results of these studies indicate a considerable monetary loss that is incurring due to traffic congestion. However, most of these studies have tended to concentrate on a particular aspect of congestion such as environment cost, emission etc. rather than analyzing the value of the loss of manpower which can be the most important component of the total cost of traffic congestion. Accordingly, this study will partly attempt to fill this void in the literature by using travel time survey data in Kandy City in Sri Lanka.

Objectives

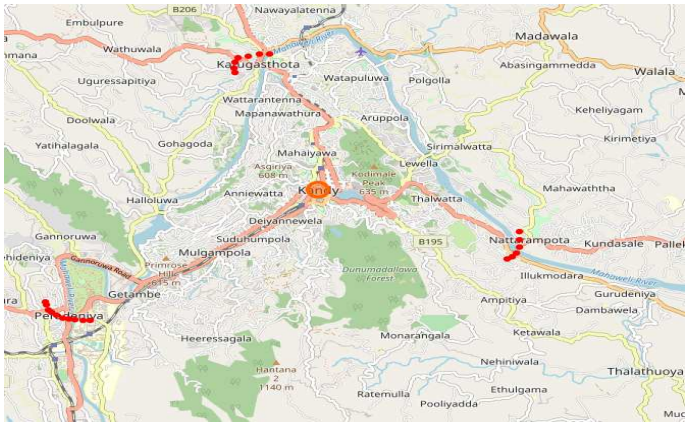
Road traffic congestion directly creates a loss of resources including manpower (Hartgen and Fields, 2009; Harriet et al. 2013). In this context, the main objective of this study is to estimate the value of the loss of manpower due to traffic congestion in Kandy City in Sri Lanka. It also compares the costs among different road users.

Methodology

This research mainly employs descriptive statistics of simple averages to analyze the field survey data. To measure the manpower loss of traffic congestion, data collected from coverage of various commuters and a road monitoring survey carried out in November 2018 are used. Data from a Vehicle Monitoring Survey covering three road corridors of the Kandy city in November 2018 is mainly used to identify the number of vehicles entering the city each day. Also, a Time Monitoring Survey carried out during the same month is used to estimate the delay time (difference between the actual time taken and average time given by Google-non traffic) for each vehicle category. We also identified the average number of passengers travelling in each vehicle using different survey techniques. Finally, the socio- economic survey covering different vehicles users is carried out to calculate the average wage rate of each category. The value of the manpower loss is estimated by combining all the survey data.

Results and Discussion

Kandy is one of the major cities in Sri Lanka located in the central province. About 0.18 million people reside within the Kandy Municipal Council (KMC) limits and more than 56,000 vehicles move daily within the area. Kandy traffic problems have made a severe impact on people by causing inconvenience as it has affected them socially and economically. At present, the Government of Sri Lanka has undertaken several expressway and road development projects that will link every part of the country. However, the government has still not taken any steps to overcome the issues related to traffic congestion in Kandy city. With this background, we identified three main corridors which lead to Kandy city from other places in the country. It presented in Figure 1.



Corridor 1 (C1)
Peradeniya Town and Kandy Clock Tower / Hospital – A1/AB42

Corridor 2 (C2)
Katugasthota Town and Kandy Market Station – A6/B518

Corridor 3 (C3)
Thennekumbura Bridge and Kandy Market Station – A26/B521

Figure 1: Main three corridors selected for the survey

Table 1: Total number of vehicles entering the city from each corridor

Time Slot	Corridor 1	Corridor 2	Corridor 3	Total	%
06 am -09 am	6,527	4,778	2,092	13,397	24
09 am-12 am	4,968	2,247	2247	9,462	17
12 pm-03 pm	5,480	3,278	3278	12,036	21
03 pm-06 pm	3,660	2,437	2437	8,534	15
06 pm-09 pm	2,804	1,307	1,199	5,310	9
09 pm- 06am	2,634	1,043	1,132	4,809	9
Total	26,073	15,090	14,877	56,040	100
Percentage (%)	46.53	26.93	26.55		

Note: Survey data is used to calculate the averages in each time slot

In many urban areas, there are increasing concerns about how the growth of traffic congestion may adversely affect the area's economy (business sales and income). At the most basic level, increasing congestion is associated with the type of vehicles that use the road as some trips on the road system related to some vehicles such as truck and bus will entail longer travel times for riders and higher vehicle operating costs for vehicle operators. The added time and the expenses for drivers and passengers are the key elements of the total congestion costs, in addition to the cost of emission. Therefore, it is vital to identify time period that different type of vehicles enter the city on a particular day. Table 1 and 2 reports the average number of vehicles and the type of vehicles accessing the city in a given working day. During business days in Kandy city, traffic congestion reaches a great intensity at predictable times of the day due to a large number of vehicles using the road at the same time. This phenomenon is called peak hour, although the period of high traffic intensity often exceeds one hour. In some places of the city, traffic volume is consistently extremely high during peak hours which is evident in the data given by Table 1. We also identified the type of vehicles entering the city from each corridor in a particular day given in Table 2.

Table 2: Type of vehicles entering the city (%)

Type	Corridor 1	Corridor 2	Corridor 3	Average	%
Bus	7.57	5.72	6.18	6.49	6.49
Lorry	4.00	3.91	3.85	3.92	4.90
Truck	0.44	0.38	0.46	0.43	
Bowser	0.36	0.52	0.76	0.55	
Car	24.63	24.00	23.82	24.15	32.60
Cabs	1.79	1.42	1.33	1.51	
Jeep	2.97	4.08	4.64	3.89	
Wagon	3.21	3.21	2.72	3.05	
Van	5.35	7.93	8.67	7.32	7.32
Ambulance	0.14	0.21	0.16	0.17	0.17
Three-wheeler	23.75	21.96	20.21	21.97	21.97
Motorcycle	25.52	26.34	26.97	26.28	26.28
Others	0.26	0.33	0.22	0.27	0.27

Note: Vehicle type is further categorized to identify the loss of manpower

According to the monitoring survey, approximately 0.28 million working age people entering the Kandy City from the three main corridors daily. All these commuters are involved in extra-time loss and sometimes delays, which may result in late arrival for employment, meetings, and education, resulting in lost business and income, disciplinary action or other personal losses. In this context, we estimated the total number of loss time (number of minutes) for different vehicle users per day due to traffic congestion and identified the monetary value of it based on the wage rate estimated. These estimations presented in Table 3.

Table 3: Estimate of the total value of the manpower loss per day

Vehicle Type	Total Vehicle No.	Total Passenger No.	Loss time (minutes)	Average Salary (Rs.)	Total Loss (Rs./ Per day)
Bus	3,620	152,040	34	1,561	16,811,190
Lorry, Truck Bowser	2,081	4,162	38	2,430	800,664
Car, Cabs, Jeep, Wagon	14,390	28,780	31	7,228	13,434,744
Van	3,427	41,124	28	1,273	3,053,800
Three Wheel	10,144	30,432	6	2,890	1,099,356
Motorcycles	12,408	24,816	-2	1,683	-174,022
Total (Rs.)					35,025,732

Note: i. Average salary is estimated based on the discussion carried out with each category. Data are only from 12 hours per day (6.00am to 6.00pm). ii. Total number of passengers is adjusted for kids/old for the bus, car, van, three wheel and motorcycles. iii. Negative number represent the benefits as their vehicles move greater than average speed.

Table 3 reports the time loss due to traffic congestion per day under each vehicle category. The total number of passengers, ajustment for kids/old commuters, average salary in each group, etc. were estimated based on several qualitative surveys carried out in the same month. Loss time (number of minutes) is the average delay time between 6.00am and 6.00pm per day. Accordingly the average loss number of man-dates per day for all commuters are approximately 15,634 for all and the value approximately about 35 million rupees per day, which is about 0.7 billion rupees per month, assuming 20 working days per month. Manpower loss is relatively higher for bus (47 %) and car, cabs, jeep or wagon user (38 %).

Conclusion

The main objective of this research is to estimate the total loss of manpower due to road traffic congestion in Kandy city in Sri Lanka. Results show that on average the value of the loss of manpower due to traffic congestion is approximately Rs. 35 million per day and which is significantly higher in public or private bus users as well as private vehicle users such as car, cabs, jeep and wagon. This indicates the magnitudes of the economic loss incurred each day due to existing traffic congestion in the city. Therefore, steps need to be taken to reduce traffic congestion and provide significant economic benefits to the commuters and the economy. According to the commuter survey, it is evident that 98 % of the respondents perceived that existing traffic congestion has some serious impact on increasing their mental stress level while approximately 97 % of the respondents accepted that traffic congestion results in decreasing their productivity in the workplace. Furthermore, it is found that the number of crossing roads, the number of vehicles parked along the roadsides, crossing rail tracks, closer location of schools, hospitals, temples, availability of number of small temporary shops (small hut-type shops) along the roadsides, narrow crossing bridge and availability of main junctions have resulted in increasing traffic congestion significantly in the study area.

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Public Education Versus Private Tutoring in Sri Lanka: Who is Contributing More?

T. N. Herath

Department of Economics, University of Sri Jayewardenepura, Sri Lanka

Keywords: *Academic Performance; Public Schools; Education; Sri Lanka*

Introduction

Private tutoring, also known as 'shadow education' is a globally expanding phenomenon (Byun et. al. 2018). In Sri Lanka, supplementary private tutoring has long been a pervasive part of many students' everyday experiences (Bray 2003). Even though the Sri Lankan government spends a huge amount of money per student (Rs. 11,804 in 2015 and Rs.11, 357 in 2016) for public education, many Sri Lankan children start attending private tution beginning from the Grade Five scholarship examination to the G.C.E A/L examination (Cole 2017). Among Sri Lankan students, private tutoring demand is very high. In 1990, it was estimated that 75 percent of G.C.E (A/L) students were attending private tuition classes. The proportion was 62 percent among G.C.E (A.L) arts students, 67 percent for G.C.E (A.L) commerce students and 92 percent among G.C.E (A.L) science students in 1990 (De Silva 1994). Empirical literature on private tutoring is growing; however whether shadow education indeed matters for academic achievement is still unclear and needs further analysis (Byun 2014: 54; Cole 2017). In Sri Lanka, the government always provides education at public cost while people also always clamor for free education. In such a situation, private tutoring is escalating. As a result, household expenditure for private tutoring is also increasing. It seems that parents enroll their students in public schools while sending them to learn in informal fee-paid out-of-school classes. As a result, parents have to spend much money on private tutoring. However, there is a lack of knowledge regarding this area. Therefore this study is an attempt to assess the contribution of public schools and private tutoring classes on students' academic performance and to estimate household expenditure for both public school education and private tutoring.

Objectives

The study assesses some selected aspects of public school education versus private tutoring for school level education. The objectives of the study are: to determine the individual contribution of both public schools and private tutoring classes to students' academic performance; to estimate per student expenditure borne by households for private tutoring; and to ascertain reasons for the demand for private tutoring.

Methodology

To achieve the objectives of the study, data was collected regarding public schools, private tutoring classes, student performance and households. In addition, information on attendance of students and the extent of teaching (the coverage of subject matter) in public schools and private tuition classes, and household expenditure for private tutoring were also collected. In this regard, a sample of 100 students who sat for the G.C.E (O.L) examination in December 2017 and 300 students who completed their G.C.E. (A.L) examination in August 2017 were randomly selected. The G.C.E (A.L) students selected represent four subject streams; i.e. Arts, Science, Technology and Commerce. All these samples were selected from among those who enrolled in public schools in Colombo District which represents the highest student population (23.3%) according to the School Census 2016. In addition, selected public sector officials of the Department of Education, principals of selected schools, Officials of private tuition classes and well-known teachers who conduct private tuition classes were interviewed in order to collect relevant data. In the case of input and output data, student performance is not separately available for public schools and private tutoring. It is available as an added variable for both sectors, and student participation can be estimated separately for both sectors. Considering this situation, the following simple linear model was adopted to determine the contribution of both public schools and private tutoring to student performance.

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + U_i$$

Y_i is the i^{th} student's academic performance, X_{1i} is the time period the i^{th} student spent in studying in his or her public school, X_{2i} is the time of the i^{th} student spent in studying in his or her tutoring class/classes, β_i are the parameters to be estimated and U_i is the residual term. Based on the above proposed model explained above, linear, log linear and reciprocal regression

models were estimated respectively taking total marks obtained by each student for his/her G.C.E (O.L) subjects studied in his private tuition class and Z-score each student obtained for his/her G.C.E.(A.L) examination as dependent variables. In addition to these models, descriptive statistics were used in estimating household expenditure for education.

Results and Discussion

Out of all G.C.E (O.L) subjects studied in private uition classes by students, tuition fee is very high for French, Western Music, English Literature, Art, Dancing and IT. However, when compulsory subjects for the G.C.E (O.L) are considered, tuition fee is the highest for mathematics, followed by science. Monthly tuition fee at G.C.E (O.L) for both mathematics and science are respectively greater than monthly per student expenditure borne by government for students in public schools. According to estimated values for quantity demanded from students in private tuition classes for each subject at G.C.E (O.L) it was found that both mathematics and sciences subjects are ranked highest. As such, higher class fee and higher demand for mathematics and science are consistent. In the case of G.C.E (A.L) monthly tuition fee of all the subjects of all streams is greater than Rs. 1000 which is equal to the monthly per-student expenditure borne by the government at present for public school education.

Inquiries were made of sampled public school students at both G.C.E (O/L) and (A.L) of eleven reasons regarding their learning in private tuition classes. Out of these reasons three were found as most influencing ones. According to the descending order of preference of students those reasons can be stated as "in the private tuition classes there is repetition of the subject matter taught in public schools and therefore tuition classes support them to understand academic matters easily; distribution of handouts and notes in the private tuition classes; and adoption of better teaching methods in fee-paid out-of-school classes". Total number of hours spent studying all the subjects in both private tuition class/es and public schools were separately included as independent variables. Parameters of tuition time in private classes are highly significant with the positive sign and private tuition classes could be identified as a significant contributor in determination of student performance at both G.C.E (O.L) and (A.L).

Conclusion

The paper concludes that private tuition classes contributes to the knowledge of students in public schools in Sri Lanka, and parents of school children spend extensively on fee-paid out-of-school classes. Even though free education is still provided in Sri Lanka, parents paid much more money on educating their children. In the case of policy recommendations, in order to produce productive results through market forces, the rapidly escalating private tutoring industry emphasizes the requirement of monitoring of the same by the government. Students attending private tuition classes understand that teaching quality is better in these classes than that in public schools. This proposes public schools to look for more attractive teaching methods. Finally, higher demand for informal fee-paid out-of-school education puts a big question mark in presence of free school education.

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Exploring Employer Expectations in the Software Development Industry in Sri Lanka

A. Jayakody, A. S. K. Bulathsinghala, L. G. C. S. Lihinigama, K. H. A. Anurad and D. M. K. N. Karunarathna

Faculty of Computing, Sri Lanka Institute of Information Technology Sri Lanka

Keywords: *Work Expectation; Quality Education; IT graduates; Software*

Introduction

The sustainable development process needs the establishment of basic economic and social institutions necessary for economic growth (Rutherford, 2002). Higher education plays a critical and prevailing role. UNESCO (2005) mentions that 'education for sustainable development' has become a hot topic and it "empowers people to change the way they think and work towards a sustainable future". Furthermore, higher education gives knowledge and understanding along with competencies, where graduates will learn how to work towards sustainable development while achieving all their goals and targets. With the growth of globalization, new development approaches incorporate software development around the world and encourage engineering and management practices. In the global software development environment, employability of new IT graduates always depends on the knowledge and competencies they leran thorugh information technologies. There are several studies conducted regarding gap between the expectations of employers and employees, but no studies have been done to explore how these competencies affect the performance expectations of employers in the Sri Lankan context.

In contrast to individual learning, team work is seen as a vital aspect of the software development industry. Noll et al. (2016) examined a global teaming model for the governance of global software development, which focuses on a system of governance for working teams. They highlighted how team integration can be influenced by the practices of each team. Mukhtar et al. (2009) found that there is a close relationship between employability and

employers' general performance expectations. There is always a mismatch between the qualification of computing graduates and the expectations of computer industry. Akman and Turhan (2018) suggest that expectations of employers in individual and teamwork settings have a significant effect on general performance expectations of the employers and this study investigate employers' performance expectations of new IT graduates' competencies in individual and teamwork settings for software development (Akman and Turhan, 2018). The study revealed that employers perceive significant diversity existing in competencies within individual and teamwork settings in terms of adapting to new software development methods, using time and experiences gained in undergraduate projects effectively (Akman and Turhan, 2018).

Objectives

The objective of this study is to examine the influence of individual work expectations and team work expectations on employers' general performance expectations for new IT graduates in the software development industry in order to achieve quality IT education for sustainable development in Sri Lanka.

Methodology

A sample of 120 employers such as IT unit/project managers or senior IT professionals were selected and 8 outliers were removed. Simple random sampling method was used to select the research participants for the study. A structured questionnaire was developed to gather primary data from employers in the software development industry and for the purpose of examining how individual and teamwork expectations influence employers' general performance expectations. A 5 point Likert scale was used with 1 = "strongly agree" and 5 = "strongly disagree". Descriptive analysis was used, as was Multiple Regression analysis using General Performance Expectation (GPE) as the dependent variable (Y). Sample size was 112 for multiple linear regression and the equation can be given as follows:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 D_i + u_i \quad (1)$$

Where, Y: General Performance Expectation (GPE), X_1: Individual Work Expectation (IWE), X_2: Teamwork Expectation (TE), u_i: error term. The study included one qualitative variable as a dummy variable in the multiple regression model. D is preference for specific university (Preference), preferred = 1, otherwise 0.

Results and Discussion

The model summary of the multiple regression analysis shows that R^2 is 0.63 and explains the overall model fit of the variables. That can be interpreted as 63% of the variance in GPE can be explained by the combination of individual work expectation, teamwork expectation and preference of specific university. The ANOVA results yields that the level of significance and multiple regression model is significant at the 5% significant level ($p<0.05$), which indicates that model is a right fit for the data. Furthermore, the findings yield that individual work expectation and teamwork expectation are statistically significant at the 5 % level. However, employers' preference for specific university is not significant at the 5 % level.

Table 1: Results of multiple regression analysis

Variable	Coefficient	Std. Error	t	P value
Constant	0.416*	0.184	2.259	0.026
X_1	0.267*	0.084	3.168	0.002
X_2	0.570*	0.088	6.469	0.000
D_1	0.097	0.159	0.609	0.544

Note: * 5 % significance level

As indicated in Table 1, using unstandardized coefficients, the regression model can be generated as below:

$$\widehat{Y}_i = 0.416 + 0.267X_{1i} + 0.5700.267X_{2i} + 0.097D_i$$

The results from the analysis shows that 71% (80 employers) of the sample shows preference for specific universities, while 29% (32 employers) of the sample is do not prefer specific universities. Using five-point Likert-scale, among the 80 employers, 67% of employers preferred graduates from local public universities. Furthermore, 61% of employers responded as preferring graduates from local private universities. However, employers' preference for

graduates from foreign universities is neutral. It represents 43% and 42% respectively. Moreover, out of 32 employers, which means employers who do not prefer a specific university also responded as preferring graduates from local public universities by representing 75%, and 56% preferred graduates from local private universities. Employers' preference for graduates from foreign universities is neutral at 50% and indicates that 16 of employers' preference for foreign university graduates is moderate while other 16 responded as preferred and least preferred.

Conclusion

The findings indicate that IWE and TE tend to be vital for the employers' GPE regarding new IT graduates in the software development industry. As the objective of this study is to examine the influence of individual work expectations and team work expectations on employer's general performance expectations regarding new IT graduates, in order to achieve quality IT education, it is clearly visible that employers are paying keen attention on the new IT graduates' competencies in order to hire them. Higher education should be of quality in order to create a graduate full of potential and competencies so that they can be hired by employers which will support the the country's development. Consequently, as UNESCO (2005) mentioned that quality of education "empowers people to change the way they think and work towards a sustainable future"; so employers will work towards a sustainable future while supporting the development of the country.

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The Impact of Procrastination, Self-Efficacy, and Motivation on Academic Performance of Undergraduates in Sri Lanka

K. C. Sandaruwan, R. H. S. Prabodhya and R. P. S. Amarasooriya

SLIIT Business School, Sri Lanka Institute of Information Technology Sri Lanka

Keywords: *Academic; Procrastination; Self-efficacy; Motivation*

Introduction

Education ensures the quality of living standards; sustainable development goals are key driving factors which help to protect educational levels globally. In today's world the competitive environment, advancing technology and growing economy require a good level of education to even achieve basic human needs. Out of the 17 sustainable goals, the fourth sustainable development goal is achiving quality education (Thomson, 2019). As a developing country ensuring quality education is vital for Sri Lanka. Therefore, enhancing academic performance of undergraduates is one of the key requirements for the development of Sri Lanka. With focus on personality traits, private universities are belived to offer scope for quality education. Measuring academic performance in a university context relating to academic personality traits is more convenient with the Grade Point Average system which was targeted in previous research. Academic procrastination can be defined as a person voluntarily postponing intended activities regardless of the consequences of the delay.

Academic procrastination is of two types, active and passive procrastination. Passive procrastinators procrastinate because they lack the ability to do the task. Active procrastinators get involved in it because they invest time and do the task efficiently. Active procrastinators have a positive impact and passive procrastinators have a negative impact on academic performance. Academic motivation is one of the powerful factors which leads undergraduates to gain more interest in learning and to contribute more time to studying willingly. Without any interest, no one would do anything which takes their time. So motivation is the factor which drives undergraduates to sacrifice their time for

academic activities which leads to better academic performance. However, there is no previous research related to this field in Sri Lanka. This is an attempt to focus on the success of education by identifying the impact from three personality traits which are academic procrastination, academic self-efficacy, and academic motivation on academic performance.

Objective

The objective of this study is to identify the impacts of personal procrastination, self-efficacy and motivation on academic performance of undergraduates in private universities in Sri Lanka.

Methodology

We follow a deductive approach. The population of this research are undergraduates from degree awarding private universities which are registered with the University Grants Commission in Sri Lanka. This comes to around 25000 undergraduates from three main private universities, under university ranking 2019. A purposive sampling technique was used, with sample size 378 according to Morgan's sample size table. In the data collection step, there was a 30-item questionnaire including three scales which are, academic procrastination scale, academic self-efficacy scale, and academic motivation scale. After collecting the data, to achieve the objectives according to the conceptual framework multiple regression analysis was done.

Results and Discussion

For the analysis, thirty items were used in the data set. The academic procrastination scale, academic self-efficacy scale, and academic motivation scale each has ten items. Because of the high Cronbach alpha value, no item was removed. Cronbach alpha value above 0.9 states high reliability and validity of the data set. Thereafter, multiple regression analysis was carried out to identify the hypothesis.

Table 1: Reliability analysis for the dataset

Cronbach alpha	Number of items	
0.95	10	AP Scale
0.92	10	ASE Scale
0.91	10	AM Scale

Table 2: ANOVA and model summary multiple regression analysis

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	10.578	3	3.526	16.398	0.000[b]
Residual	81.065	377	0.215		
Total	91.643	380			
R=0.340	R^2= 0.115		Adjusted R^2= 0.108		

F (3,377) =16.4, p<0.001, R^2 =0.11

According to ANOVA output and R^2 results, 10.8% of the variation in academic performance (GPA) is explained by academic procrastination, academic self-efficacy, and academic motivation.

Table 3: Multiple regression analysis coefficients

	Unstandardized Coefficients			
	B	Std. Error	t	Sig.
Constant	1.312	0.209	6.288	0.000
AP	0.377	0.093	4.054	0.000
ASE	-0.118	0.098	-1.202	0.230
AM	0.080	0.099	0.806	0.421

$$\mathrm{GPA}_i = \gamma_0 + \gamma_1 \mathrm{AP}_i + \gamma_2 \mathrm{ASE}_i + \gamma_3 \mathrm{AM}_i + \varepsilon_i$$

$$\widehat{\mathrm{GPA}}_i = 1.312 + 0.377\mathrm{AP}_i - 0.118\,\mathrm{ASE}_i + 0.08\,AM_i$$

From the multiple regression analysis, it can be noticed that only academic procrastination is a significant predictor of academic performance ($p < 0.05$); and it explains 37% positive impact on academic performance. Both academic self-efficacy and academic motivation do not significantly impact on academic performance. Academic self-efficacy has a negative impact on academic performance (Davis, 2009).

Conclusion

Quality education can be achieved by maintaining academic performance better, while complying with sustainable development goals. From the results, it can be noticed academic procrastination significantly and positively affect academic performance (Kandemir Mehmet and Palanci Mehmet, 2014). But academic self-efficacy and academic motivation are not significant predictors of academic performance. By avoiding passive procrastination, controlling negative self-efficacy and keeping motivation in a positive state, undergraduates can achieve better academic performance. Then quality education can be sustained within Sri Lankan university context.

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Does Human Capital Matter for Economic Growth in Sri Lanka? An Analysis Using Employment-Based Human Capital Indicators[8]

K. A. N. I. Kariyapperuma, C. R. Abayasekara and M. G. C. N. Madadeniya

Department of Economics & Statistics, University of Peradeniya, Sri Lanka

***Keywords**: Human Capital; Employment; Education; Health*

Introduction

'Human Capital'is considered a factor of production (e.g. Becker, 1964; Shultz, 1961; Romer, 1986; Lucas, 1988), with education, health, training and experience as key components (Becker, 1992). Its empirical contribution to economic growth, however, shows a large variation across the range of human capital indicators in use[9] (Flabbi and Gatti, 2018). At the macro level, physical indicators of human capital in terms of education and health tend to be based on the entire population. Examples are: literacy, numeracy and educational attainment (World Economic Forum, 2017)[10], and in Sri Lanka, (indices for) adult literacy and gross enrollment in constructing a proxy for education and (an index of) life expectancy for health (Vijesandiran and Vinayagathasan, 2015), and primary school enrollment (adjusted for health).

A recent approach targets the education and health status of the *employed* population in Sri Lanka (Sumaiya and Abayasekara, 2016) on the grounds that this group is directly involved with domestic production. All these models, however, yield ambiguous results for the relationship between human capital and economic growth for Sri Lanka. For instance, the education-economic growth nexus is negative (Vijesandiran and Vinayagathasan, 2015) or positive (Sumaiya and Abayasekara, 2016, Godagampala, 2018[11]). Also, real capital

[8] The authors gratefully acknowledge the invaluable assistance provided by S. Sivarajasingham in model estimation, and suggestions by anonymous referees.

[9] And on specific model used

[10]For a 'capacity' sub-index of human capital

[11] Using education 'adjusted for health'

and recurrent expenditure on human capital shows no significance for growth in one case (Vijesandiran and Vinayagathasan, 2015), but positive (for capital expenditure) and negative (for recurrent expenditure) relationships in another (Godagampala, 2018). The research gap is the lack of consistent empirical confirmation of the expected positive relationship between, on the one hand the education and health components of human capital, and on the other hand, economic growth for Sri Lanka. The research problem is therefore whether such positive relationships exist for Sri Lanka.

Objectives

The objectives of the study are to first construct employment-based Human Capital Indices for Sri Lanka and secondly, to investigate the existence of a dynamic relationship between the constructed indices and economic growth.

Methodology

To meet the first objective, annual employment is first broken down separately into four educational groups and five age-groups as defined by the Sri Lanka Quarterly Labor Force Survey[12]. Weights are then applied to these groups to obtain 'adjusted' (weighted) employment separately for education and health. An 'Education-Adjusted Employment Index' (EAEI) and 'Health-Adjusted Employment Index' (HAEI) are then constructed. Formulae and calculations areshown in Table 1.

A (composite) Human Capital Index (HCI) is also derived as $HCI = \sqrt{(EAEI * HAEI)}$. The indices differ from commonly used physical indicators of education and health which apply to the entire population irrespective of their labor force status. Human capital, H is conceptualized as entering the growth function through Y = f (K, H), where Y refers to an output measure and K is physical capital.

[12] Conducted by the Department of Census and Statistics

Table 1. Construction of Human Capital Sub-Indices

Item	Education	Health
No. of groups	Four[1]	Five[2]
Basis for weighting	Mean completed years of education, y_j for group j	Life Expectancy at Birth for mean age, y_j, group j
Maximum j	j = 4	'Max' (Highest Life Expectancy among age groups)
Minimum j	j = 1	'Min' (Lowest Life Expectancy among age groups)
Weight, w_j	y_j / y_4, where j=1-4	y_j / y_{max}, where j=1-5
Sub-Index	EAEI = $\frac{\sum_1^4 w_j E_j - w_1 E}{w_4 E - w_1 E}$	HAEI[3] = $\frac{\sum_1^5 w_j E_j - w_{min} E}{w_{max} E - w_{min} E}$

Notes: [1] Defined as 'Grade 5 & below', 'Grade 6-10', 'GCE O Level/NCGE', GCE A Level/HNCE & Above'[2] Defined as '15-19', '20-24', '25-29', '30-39', '40 & Above'[3]w_{max} and w_{min} refer to maximum and minimum weights, respectively, which are in turn derived from the respective maximum and minimum y values.[13]

To meet the second objective, viz. exploration of a dynamic relationship between economic growth and human capital, the following alternative models are constructed:

$$LnGDPPC_t = \beta_0 + \beta_1 LnGCF_t + \beta_2 HCI_t + u_{1t} \quad (1)$$

$$LnGDPPC_t = \delta_0 + \delta_1 LnGCF_t + \delta_2 EAEI_t + \delta_3 HAEI_t + u_{2t} \quad (2)$$

Ln GDPPC is the natural log of Gross Domestic Product per capita; Ln GCF is the natural Log of Gross Capital Formation (constant (2010) US$); HCI, EAEI and HAEI are the indices defined above; and u_{1t} and u_{2t} are the two error terms. The study period is 1990-2016, which is due to labor force data being available annually (quarterly) only from 1990 onwards. Employment data are obtained from the annual report of the Quarterly Labor Force Survey of the Department of Census & Statistics, Sri Lanka, and data for the remaining variables, from the online database of World Development Indicators (World Bank).

[13]Note that $w_{min}E < \sum_1^s w_j E_j < w_{max}E$, so that 0 <EAEI< 1,0 <HAEI< 1, where s=4 or 5 as the case is.

Stationarity of the variables was tested using Augmented Dickey Fuller and Philips Unit Root tests. Akaike Information Criterion was used as the model selection criterion. Given the relatively small number of observations, the long run equilibrium relationship between the variables was estimated through the Auto Regressive Distributed Lag (ARDL) Bounds Testing approach and the ARDL Error Correction Model was used to identify the short run relationship between variables. Diagnostic tests were conducted to check whether the results are robust. The tests conducted are, Jarque-Bera test to check whether the residuals are normally distributed, Lagrange Multiplier (LM) test to detect serial correlation among residuals, Breusch-Pagan-Godfrey test to detect heteroscedasticity in the model, Ramsey RESET test to check whether the model is specified correctly, and the Cumulative Sum (CUSUM) test and Cumulative Sum Squares (CUSUMSQ) test to check the stability of the model.

Results and Discussion

The behavior of the different indices over time is investigated and the EAEI shows a clear upward movement, representing a shift of the employed population towards higher education levels. The fall in the HAEI over some years has to be interpreted as the outcome of three reinforcing trends: the (natural) slowing down of the rate of increase in life expectancy, the reduction in differences in life expectancy across cohorts, and ageing of the working population[14]. The movements of these two indices in turn give the resulting trend for the HCI, which shows little increase by the end of the period.

The two models were estimated separately. After confirming that the variables are stationary at level or in the first difference, and that there is cointegration among variables in the model (through the ARDL bounds test), ARDL long run and short run estimations were derived firstly for Model 1 and secondly for Model 2. In Model 1, the HCI is not significant with GDP per capita both in the long and the short run. But there is a significant and positive relationship between Gross capital formation and GDP in both long run and short run.The long run relationship derived from ARDL model estimations for Model 1 is given below.

[14] Over 50% of the employed are in the highest defined age group of ’40 and above’

$$Ln\,\widehat{GDPPC_t} = \underset{(0.0000)}{-7.334465} - \underset{(0.2915)}{0.982607\,HCI_t} + \underset{(0.0000)}{0.671797\,LnGCF_t}$$

The Error Correction Term showed that the model is stable in the long run and there is long run adjustment. GDP growth moves back to equilibrium path and the disequilibrium error is corrected by 21.2 percent each year, following an exogenous shock. However in Model 2, findings indicated that both EAEI and HAEI have a significant and positive relationship with GDP in the long run. The long run relationship derived from ARDL model estimations for Model 2 is given below.

$$Ln\,\widehat{GDPPC_t} = \underset{(0.0000)}{7.1900\,EAEI_t} + \underset{(0.0215)}{1.1485 HAEI_t} + \underset{(0.0000)}{0.1666\,LnGCF_t}$$

It indicates that (better) health and education make a positive contribution to the country's economic growth in the long run. This is consistent with expectations and differs from results of some other models and indices referred to earlier. It also 'validates' the representation of human capital in terms of the education and health status of the working population. However, the lack of significance in the overall HCI needs to be investigated further[15], and is different from the findings of the 'health adjusted education index' in Godagampala (2018).

As per the Error Correction Model, in the short run, both EAEI and HAEI show a significant relationship with growth; but whereas the former shows a positive relationship (except for lagged values), the latter shows anegative relationship in its lags. This may reflect the decline in HAEI over short periods of time noted earlier. However gross capital formation in both long run and short sun impact on GDP significantly and positively.

The Error Correction Term showed that the model is stable in the long run and there is long run adjustment. GDP growth moves back to equilibrium path and the disequilibrium error is corrected by 33.1 percent each year, following an exogenous shock. All the diagnostic tests proved that there are no diagnostic errors in the two models and the results are robust.

[15] There is presumably an 'interaction' effect between education and health, apart from its separate effects.

Conclusion

Human capital is seen to unambiguously increase over time when represented by the educational status of Sri Lanka's employed population over time, but subject to short periods of decline in terms of its health status as measured by Life expectancy at Birth. Both indices however show a positive and significant relationship with economic growth over the period. This indicates that the index formulation in the current model performs better than some others. It also suggests that raising the educational and health status of the workforce is a worthwhile goal for sustained economic growth. However, their combined effect as measured by the geometric mean of the two indices is not significantly related to economic growth, and therefore needs further investigation.

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International Migration Flows in South Asia: A Cross-Sectional Analysis

D. N. Ranawaka

SLIIT Business School, Sri Lanka Institute of Information Technology
Sri Lanka

Keywords: *International Migration; Flows; Development; South Asia*

Introduction

As of 2017, the Asian continent consists of 60% of the world's population (World Population Review, 2017) where the stock of migrants in Asia had increased drastically from 40 million to a nearly 60 million since 2005 (IOM, 2018). Interestingly, out of the top 20 migrant countries in 2015 in Asia, India is ranked as the top contributor followed by Pakistan and Bangladesh in fourth and fifth places along with Afghanistan in the tenth place (IOM, 2018) signalling that South Asia contributes to the world migration flows significantly in an era where the development in the South Asian region is acknowledged by the world bank (The World Bank, 2018). The purpose of this paper is to understand which factors contribute to bilateral migration in South Asia and to explore if there exist salient patterns for migration flows for developed and developing regions. Furthermore, this paper seeks to understand why people migrate from South Asia and what aspects of policies would help sustain this wealth of human resources within the region.

Objectives

Evaluating the factors that encourage international migrant flows in the South Asian region - accordingly, main objectives are: to identify and examine the contributing factors for international migrant flows; to rationalise high outflows from the region and to prescribe policies to sustain the wealth of human resources.

Methodology

The methodology consists mainly of two analyses; literature review and a quantitative analysis using cross-sectional regression data for South Asian countries for the year 2017[16]. The Equation estimated (2), inspired by the gravity model is based on a research conducted by Mayda (2009) for 14 OECD (Organization for Economic Co-operation and Development) countries where the bilateral emigration rate (ER) is identified as the dependent variable with log of per-worker Gross Domestic Product (pwgdp) of the lagged year (2016), distance between the two countries (dist), contiguity (contiguity=1 if a border is shared), common language (comlang=1 if 9% or more share the same language), unemployment rate (unem), colony (colony=1 if the countries share colonial linkages), border (border=1 if the country is landlocked), log of share of young population (logyoungpop) between ages 25-29 of the origin, relative inequality of the origin country (GINI) are identified as independent variables.

$$log\mathrm{ER}_{ijt} = \beta + \beta_0 logpwgdp_{jt-1} + \beta_1 logpwgdp_{it-1} + \beta_2 logdist_{ij} + \beta_3 border_{ij} + \beta_4 comlang_{ij} + \beta_5 unem_{ij} + \beta_6 GINI_{ij} + \beta_7 colony_{ij} + \beta_8 contiguity_{ij} + \beta_9 logyoungpop_{it-1} + \beta_{10} immigpol_{jt} + \varepsilon_{ijt} \quad (02)$$

A linear regression analysis is conducted using Ordinary Least Squares (OLS) method[17]. The regression is estimated for different pools of countries to capture the dynamism of determining factors for migration outflows from South Asian countries.

Results and Discussion

While the factors such as wages of the origin country and young population are statistically insignificant within the global outlook, these determinants vary highly according to economic capacities of the destination country as well as regional diversities.

[16] Latest available dataset for bilateral migration flows in the world is the year 2017.

[17] Robust estimates were generated to address the issue of heteroscedasticity where OLS models are highly sensitive. Multicollinearity and omitted variable biasedness was tested through VIF and Ramsey RESET tests the results indicated these issues are not visible within the estimated model.

The following Table of summarised results highlights how certain determinants are statistically significant only in certain parts of the world.

Table 1: Summary of the results

Determinants	Western Countries	Asia	Middle East
Wages (Origin)	Insignificant	Insignificant	Significant
Wages (Destination)	Significant	Significant	Insignificant
Poverty	Significant	Insignificant	Significant
Cultural factors	Significant	Significant	Significant

A few interesting patterns of migrant flows surface when the above table is carefully analysed. Western countries are popular migration destinations because of its economic capacity and comparatively higher wage rates. However, the determinants vary according to specific regions as well. By inferring from regression results, it is evident that poverty and lower wages in the origin country are push factors as opposed to migrating to Asian countries. Migration outflows for Asian countries are not induced through poverty, but because of aspirations for better livelihoods among the South Asians. Interestingly, cultural factors such as common language and common colonial linkages are significant across all groups of analysis.

Table 2: Regression results

	World EQ 2	Western EQ 2	Asia EQ2	Middle East EQ 2
Log Migration outflows				
LogPWGDP_Origin	-0.173	0.030	0.243	2.139
	(0.247)	(0.837)	(0.287)	(0.018)**
LogPWGDP_Dest	1.1567	-0.169	0.542	-0.483
	(0.000)***	(0.000)***	(0.078)*	(0.178)
Distance	-0.000	0.001	-0.001	-0.0001
	(0.000)***	(0.423)	(0.000)***	(0.202)
Unemployment	-0.194	-0.169	0.074	-0.029
	(0.066)*	(0.179)	(0.63)	(0.823)
LogYoungPop	-1.732	-2.273	-1.438	0.491
	(0.857)	(0.002)**	(0.214)	(0.662)
Gini	-0.009	-0.117	0.015	-0.252
	(0.001)**	(0.08)*	(0.883)	(0.082)*
contiguity	3.123	NA	1.525	NA
	(0.000)***		(0.039)**	
commonlang	2.4310	2.485	3.267	2.845
	(0.000)***	(0.000)***	(0.000)***	(0.023)**
comcol	1.895	1.551	-0.281	0.704
	(0.072)*	(0.023)**	(0.747)	(0.73)
Imig_Policy	-0.798	-1.036	0.197	-0.590
	(0.022**)	(0.005)**	(0.845)	(0.586)
_cons	6.706	1.717	9.127	0.171
	(0.243)	(0.756)	(0.196)	(0.982)
Number of Obs	332	218	60	39
F(9, 322)	21.01	9	7.46	7.32
Prob > F	0.00	0.00	0.00	0.00
R-squared	0.352	0.264	0.4944	0.564

Note : ***, **, *, denote significance levels at 1%, 5% and 10% respectively; p values indicated in parenthesis

Conclusion

Wage expectations of the destination country can be identified as the key determinant for migrants in the South Asia. This could be an indication of some economic drawbacks such as wage disparities across some occupations in the region. Literature highlights the significance of acculturation and personal adjustment. This is identified as a predominant factor in deciding migration destinations where dummy variables colonial linkages and common languages are proven to be significant across all the migration flows. Economic disparities such as unemployment are also identified as factors that contribute to the outflow of migration from the region. The only exceptions

are Pakistan and Nepal where dynamics and variation of the impact too differentiates between the two countries. Looking through a wider lens on the findings, we can identify that people migrate mainly expecting higher wages and for better livelihoods; a harder task to attain while living in the South Asian region. Therefore, the economic inequalities and inefficiencies should be given more weight in order to make use of the human resource we have as the "comparative advantage" in the South Asian region.

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The Education Component of Human Capital: Explorations with an Indicator for Sri Lanka

C. R. Abayasekara and M. G. C. N. Madadeniya

Department of Economics & Statistics, University of Peradeniya, Sri Lanka

Keywords: *Education; Gender; Human Capital; Labor Force*

Introduction

Education is a primary component of 'human capital'[18], a key factor of production (Becker 1992, 1964; Romer, 1986; Lucas, 1988). Physical indicators of education are either 'input-based', as in years of schooling and enrollment ratios, or 'outcome-based' as in literacy rate and 'Learning-Adjusted Years of Schooling' (World Bank, 2019).

A recent approach (Sumaiya and Abayasekara, 2016; Kariyapperuma, 2018) measures the human capital of the *employed population*[19] for Sri Lanka through an 'Education-adjusted Employment Index' (EAEI), to account for the changing composition of education over time. The computed index does not cover the unemployed and those outside the labor force; nor does it differentiate between genders[20]. It has also not been 'validated' as an alternative indicator to others in use. The research problem therefore constitutes the following questions: How does the index and its rate of change compare among males and females, employed and unemployed, and those within and outside the labor force in Sri Lanka; and does public expenditure on human capital have an impact on education-based human capital accumulation as measured by the index?.

[18] Other aspects of human capital being health, training and experience
[19] This approach fits the concept of 'deployed ' human capital (WEF, 2017).
[20] Significant gender-wise differences exist in the rate of unemployment as well as labor force participation in Sri Lanka (e.g. Gunewardena, 2015).

Objectives

The objectives of the study were to compute a new Education-Adjusted Index (EAI) in line with data and methodological considerations; to identify trends in the index by gender for the employed, the unemployed, and those outside the labor force; and to draw policy implications about the effectiveness of government expenditure on human capital in augmenting education-based human capital within the labor force.

Methodology

The first objective was met by applying the post-2012 survey definition of 'working age population' to the entire series[21], 1993-2017, and by deriving the index using a different weighting system for education levels. The second objective was met by computing the index separately by gender across all sub-populations specified above. The third objective was met by conducting a time series analysis, regressing the index values (EAI) computed for the labor force for each year on government real expenditure on education as a percentage of real GDP (EEGDP), government real expenditure on public health as a percentage of real GDP (HEGDP), and on per capita real GDP (GDPPC). The model was specified as follows.

$$\mathrm{EAI}_t = \beta_0 + \beta_1 \mathrm{EEGDP}_t + \beta_2\, \mathrm{HEGDP}_t + \beta_3\, \mathrm{LGDPPC}_t + \varepsilon_t \qquad (1)$$

All data for index calculations were obtained from the Annual Reports of the Quarterly Labor Force Survey of the Department of Census & Statistics for the period 1990-2017. Other data used in estimation were obtained from Annual Reports of the Central Bank, Sri Lanka for the same period. Augmented Dickey Fuller and Philips Perron unit root tests were used to check whether the variables were stationary. Due to the limited sample period, Auto Regressive Distributed Lag (ARDL) Bounds Testing approach was used to study the long run equilibrium relationship between variables. ARDL Error Correction Model was estimated to study the short run relationship between variables. Akaike Information criterion was used as the model selection

[21] Replacing the previous definition of '10 & above' by '15 & above' required estimating new percentages for the relevant population group attributed to each education level. Data for those outside the labor force is available only from 2008.

criterion. The level of significance considered in the analysis is 5 percent. Diagnostic Tests were conducted to check whether the results are robust (Jarque-Bera test, Lagrange Multiplier – LM test, Breusch-Pagan-Godfrey test, Ramsey RESET test, Cumulative Sum - CUSUM test and Cumulative Sum Squares - CUSUMSQ test).

Results and Discussion

While all indices showed improvement over the period in question, the relative performance of the gender categories is outlined below.

Table 1. Summary of Index Performance – Average Values 1993-2017

Gender	Female			Male		
Category |	EAI Av.	S.D.	CV (%)	EAI Av.	S.D.	CV (%)
Employed	0.49	0.05	10.3	0.46	0.03	6.5
Unemployed	0.70	0.04	6.0	0.60	0.04	7.0
Working Age Pop.	0.49	0.03	5.3	0.48	0.02	4.9
Not in Labor Force	0.46	0.02	5.2	0.45	0.04	8.8

Note: S.D. refers to Standard Deviation, and CV to Coefficient of Variation
Source: Authors' calculations based on data from the Quarterly Labor Force Survey reports, Department of Census & Statistics, Sri Lanka

An index *value* indicates the proportion covered of the hypothetical gap between *minimum* and *maximum* human capital (education) for a given sub-population. The values are therefore not strictly comparable across sub-populations, except to indicate the success in meeting their *own* 'gap'. For both females and males, the index was highest among their unemployed but relatively low for those 'not in the labor force', as illustrated in Table 1 by their mean values over the period. This implies that raising the human capital of the workforce is more a matter of reducing unemployment rather than increasing labor force participation. The female-male human capital gap is highest among the unemployed, so that reducing female unemployment in particular would contribute more to the above goal. The observed changes in the index suggest that reducing the rate of female unemployment and creating

job opportunities for those with higher educational qualifications would speed up the rate of human capital accumulation in the workforce.

In estimating a dynamic relationship, correlation analysis showed significant negative correlation between government expenditure on education (GDP ratio) and the Education-Adjusted Index for the Labor Force. This does not necessarily mean that government expenditure on education leads to lower education based human capital; the regression analysis showed that government expenditure on education as a percentage of GDP has no significant impact on the accumulation of human capital (through education) either in the long run or short run. In contrast, per capita real GDP and government spending on health have a significant positive impact on education-based human capital. According to the Error Correction model results, there is no significant relationship between variables in the short run. The Error Correction term which is negative and significant, shows that the model is stable in the long run and there is long run adjustment. GDP growth moves back to equilibrium path and the disequilibrium error is corrected by 82 percent each year, following an exogenous shock. All the diagnostic tests proved that there are no diagnostic errors and the results are robust.

The reason for a negative correlation between government expenditure on education and the Education-Adjusted (Human Capital) Index can be explained as follows. Real expenditure on education as a percentage of real GDP has declined over the past. However, the index has increased over time, showing a gradual shift of the labor force from lower to higher education levels. The regression results indicate that government expenditure on education has not contributed to this transition. Hence it is necessary to check on the efficacy of *specific* expenditure items within education[22]. The significant positive impact of government spending on public health to GDP ratio and per capita real GDP on the index in the long run shows that free health services and economic growth greatly contribute to the accumulation of education-based human capital in the long run. In fact, improvement in health and wellbeing does not have a contemporaneous, but lagged effect on

[22] The rise in human capital is also consistent with the impact of unmeasured variables such as private expenditure on education and an attitude among people that educational qualifications are necessary to get a better job.

improvement in human capital. Thus, public expenditure on health is a way of addressing human capital issues in the long run.

Conclusion

Human capital as measured by an Education Adjusted Index indicates that its average level in recent times has been higher among the unemployed than the employed, especially for females. Its rate of increase has tended to be higher for females among those employed, and for males among those unemployed. Accumulation of human capital in the workforce would benefit from movement of both females and males from unemployment to employment. Income growth and public health expenditure have contributed to raising education-based human capital (as measured by this index), but public expenditure on education has not. These findings imply that growth and public health expenditure are important for human capital accumulation, but the effectiveness of the components of public education expenditure should be examined.

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Technical Efficiency and its Determinants of Small – Holder Rubber Farmers in Kalutara: Stochastic Frontier Analysis

N. N. S. De Costa and A. Thayaparan

Vavuniya Campus, University of Jaffna, Sri Lanka

Keywards: *Efficiency; Rubber; SFA; Kalutara*

Introduction

Rubber is one of the prime agricultural export crops that brings an exceptional amount of foreign exchange and also provides sustained socio-economic benefits to the country. According to the Agalawatta Rubber Research Institute's (RRISL) statistical data, more than 63% of the national rubber production is significantly contributed by the small rubber cultivators who own less than 20 acres, and have provided a large number of direct and indirect employment opportunities. Rubber production grew by 5.1% to 83.1 million Kgs in 2017 from 79.1 million Kgs recorded in 2016. This growth in natural rubber production was achieved amidst unfavourable weather conditions, particularly during the first half of the year which resulted in severe floods in traditional rubber areas. Among the major categories of rubber produced, sheet rubber production increased by 4.4% while crepe rubber production decreased by 23.3 % in 2017. On the other hand, the cost of production of rubber has been increasing over the years making rubber production less attractive for the smallholder sector.

Sri Lankan rubber growing areas are mainly located in the wet zone and the top three growers in the rubber industry in the country are identified as Kegalle, Kalutara and Ratnapura Districts. Kalutara district is well-known for small rubber cultivation because its wet climate and fertile soil are favourable to cultivate rubber and most of the cultivators in the study area are engaged in cultivating rubber by utilizing their traditional knowledge and techniques. Technical innovation and more efficient use of existing technology are the main strategies of achieving high level of output in a small holder rubber sector (Hoang and Coeli, 2009). However, in developing countries like Sri Lanka, mostly new agricultural technologies have become partially successful in improving the productivity.

Objectives

The major objectives of the study are: to estimate the technical efficiency of small rubber cultivators in Kalutara district; and to evaluate the effect of demographic and farming characteristics on the technical efficiency of rubber milk (latex) production in the above district.

Methodology

Kalutara district was purposively selected to ensure the sample size for the study which has 14 Divisional Secretariat (DS) divisions in the district. Out of 14 divisions, 4 Divisional Secretariats - Agalawatta, Mathugama, Bellana and Wallavita - were taken as the study area and 25 small rubber cultivators who owned less than 20 acres were randomly selected from these four divisions. The study used a questionnaire to collect the relevant information from 100 respondents, as well as conducting group discussions and interviews during the end of 2018. The collected data were analyzed using frequency distribution, Cobb – Douglas production function and stochastic frontier model. Frequency test was analyzed for demographic and farming characters, and the Cobb – Douglas production function impact of each input on rubber milk was estimated in the study. The production function can be expressed as:

$$lnY_i = \beta_0 + \beta_1 lnX_{1i} + \beta_2 lnX_{2i} + \beta_3 lnX_{3i} + \beta_4 lnX_{4i} + v_i - u_i$$

Where, ln represents the natural logarithm and the subscript i denotes the i^{th} cultivator in the sample $i = 1, 2, \dots, n$. Y_i is the yield of rubber output/latex; X_1 is Land Extent (in acres); X_2 is labour cost (Rs); X_3 is fertilizer cost (Rs); and X_4 is tapping cost (Rs). v_i's are the iid random erros with mean (μ_i) zero and variance, σ_v^2. u_i's are non-negative random variables called as technical efficiency effects which are assumed to be independently distributed such that u_i is defined by truncation (at zero) of the normal distribution with mean (μ_i) and variance, σ_u^2. In addition to that, to estimate the technical efficiency scores and its determinants among the small holder rubber cultivators, stochastic frontier production function was also employed in the study. The stochastic frontier production function can be shown as:

$$Y_i = f(X_i, \beta) exp^{(v_i - u_i)}$$

and it can be simply defined as:

$$u_i = \sigma_0 + \sigma_1 z_{1i} + \sigma_2 z_{2i} + \sigma_3 z_{3i} + \sigma_4 z_{4i} + \sigma_5 z_{5i} + \sigma_6 z_{6i} + \sigma_7 z_{7i} + \sigma_8 z_{8i} + \sigma_9 z_{9i} + w_i$$

Where, Y_i represents the output of the i^{th} rubber farm, X_i is the vector of different input used and β shows a vector of unknown parameter to be estimated, v_i' s and u_i' s are the same meaning as explained above.

u = Technical inefficiency

z_1 = Age z_2 = Gender z_3 = Household size

z_4 = Education level z_5= Income z_6 = Farming experience

z_7 = Types of land z_8 = Types of labour z_8 = Credit accessibility

w_i = Unobservable random variable

Results and Discussion

Table 1 shows the results of production functions for Cobb-Douglas and stochastic frontier model estimated by the Ordinary Least Squares method and Maximum Likelihood method respectively. Comparing the production elasticity between the two functions, all variables were significant except fertilizer in both models. Out of four inputs, the highest elasticity was land and tapping costs in both functions; however compared to tapping cost, elasticity of rubber output with respect to labour was higher in stochastic function than in Cobb- Douglas.

Table 1: Estimated results of production functions

Variables		Coef.	t - value		Coef.	t – value
Constant	β_0	3.572	9.25	β_0	3.640	9.62
Ln land	β_1	0.669	10.42*	β_1	0.666	10.59*
Ln fertilizer	β_2	-0.008	-0.36	β_2	-0.012	-0.53
Ln tapping	β_3	0.329	5.99*	β_3	0.327	6.07*
Ln labour	β_4	0.032	2.16**	β_4	3.397	2.15**
Sigma squa.	σ^2	0.050	5.01*	σ^2	0.004	6.04*
Log- like.		124.77			128.56	

Adjusted R^2 value = 0.998 F- Value = 6828.199 P - Value = 0.000

Note: * and ** represent 1% and 5% significant levels respectively.

In the stochastic frontier model, the highest elasticity was for labour which is 3.39, implying that a 1% increase in labour cost would increase the production of rubber by 3.39%. The sum of all production elasticity coefficients was more than one in both models indicating that on average rubber farms were operating under increasing returns to scale. The technical efficiency of the sampled rubber cultivators ranged between 0.91 and 0.99 and the average technical efficiency was found to be 0.96 percent which shows that rubber cultivation attained 96% efficiency in the study area.

Table 2: Determinants of technical efficiency on rubber farms

Variable	Coefficient	Standard error	t – value
Constant	0.231	0.071	3.25
Gender	0.001	0.025	0.04
Age	-0.007	0.001	-2.32**
Secondary educatior	-0.027	0.031	-1.87
Higher education	-0.020	0.032	-0.64
Family size	0.013	0.012	1.09
Farm experience	-0.002	0.004	-2.86*
Types of land	-0.028	0.046	-2.62**
Types of labour	-0.028	0.027	-2.05**
Credit accessibility	-0.226	0.036	-3.62*

Note: *and **represent 1% and 5% significant levels respectively

The results of efficiency achieved by demographic and farming characteristics are depicted in Table 2. According to that, out of nine explanatory variables only five of them were significant determinants of technical efficiency of rubber, and others were insignificant. Coefficient of age has a negative sign revealing that increase in age of the cultivator could reduce the inefficiency in the model. In other words, younger farmers are more likely to be technically inefficient than older farmers and it is statistically significant at 5% level. This may happen due to their good managerial skills and experience which they acquired over time. Therefore, the younger farmers should be encouraged to work with older farmers in rubber cultivation which may help raise efficiency in the future. Negative sign of the farming experience implies that, the cultivators who have more experience in rubber cultivation could increase the efficiency of rubber farms in the study.

Type of land is significant at the 5% level implying that cultivators who have their own lands are more technically efficient than the cultivators who have rented or tenanted lands. This may be because compared to tenant cultivators, own-land cultivators would be motivated to use innovative production techniques in their cultivation which may raise the technical efficiency of rubber farms. Further, the estimated coefficient of types of labour was negative and significant at 5% level revealing that cultivators who used more hired labours in rubber farms were found to be technically efficient than those who used family labour. Hence, the effect of hired labour is higher than family labour and, since rubber tapping is a heavy labor intensive activity and latex extraction is a skilled job, using skilled hired labour may raise rubber yields in the cultivation.

Frequency analysis also revealed that the majority of rubber plantation owners used hired labor for tapping of rubber in the rural areas. Like the other agricultural sector, family labour cannot simply engage in rubber farming, because tapping experience, knowledge and skills are important to increase rubber productivity. Tappers with experience, knowledge and tapping skills are different across hired and family labour and thus compared to family workers, hired workers have these aspects which would help enhance the technical efficiency of rubber in the study. The coefficient for farmer's access to credit was negative at the 1% level of significance implying that the use of credit could decrease the inefficiency effect on rubber production. This finding suggests that rubber cultivators who have credit facilities face less financial constraints which oblige them to use the inputs in the optimal way.

Conclusion

This study evaluates technical efficiency and its influencing factors on rubber farms using a Cobb- Douglas production function and stochastic frontier model with data obtained from a survey conducted among small-holder rubber cultivators during October to December, 2018. The findings of the study proved that all estimated parameters in both models had significantly influenced the rubber farms in the study area except fertilizer cost. Sum of the elasticity coefficients being greater than one reflects rubber cultivation being operated at increasing returns to scale. The policy implication of the study is that, on average the sampled rubber cultivation farms had technical efficiency at 0.96 which showed that rubber cultivators could increase its output by about 4% at the given inputs. Significant determinants of efficiency of rubber cultivation

were age, farming experience, type of land, and type of labour and credit accessibility while gender, both primary and secondary education levels and farm size were insignificant in the model. This study recommends that the government should give more education about rubber cultivation by training including tapping trees and managing rubber farms especially for family labour for tapping that can be applied in farming to enhance productivity and efficiency in the future.

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An Evaluation of Crop Damage Done by Wild Animals in Meegahahena Grama Niladari division

P. A. S. K. K. Kahapola

PGIHS, University of Peradeniya, Sri Lanka

Keywords: *Risk Assessment; Pair Wise Ranking; Animals; Crop Damage*

Introduction

Quantifying crop damage has a fundamental role in determining loss yet does not provide a complete or accurate representation of the impact of crop damage by animals on affected communities (Webber and Hill, 2014). Although there are various programmes to increase local food production such as 'Waga lanka waga sangramaya', it is necessary to take immediate action to save crops from the threats of wild animals. Some reports reveal that nearly one third of crops is eaten or destroyed by animals. Although this has become a national issue, sadly there have not been many studies on this issue to identify the gravity of the issue and to come up with possible solutions. Nonetheless this issue is now being discussed at national level on various platforms and the necessity to carrying out a study on this has been identified. Meegahena North Grama Niladari division is one such Division in Galagedara Divisional Secretariat area which has been subjected to threats of wild animals on crops for the last decade or so, and is selected for this study.

Objectives

Objective of this study is to identify the intensity of wild animal threat on crops and to find out a sustainable solution to overcome this issue with the participation of the affected community.

Methodology

The study was done in two stages; a participatory risk assessment group discussion followed by a survey. Initially the group discussion was conducted with the participation of a group of 60 villagers including farmers, housewives and relevant government officials assigned to Grama Niladari divisions.

Participatory Rural Appraisal techniques & tools such as brain storming, pair wise ranking, risk mapping, group discussions, and focused group discussions were adopted to gather data. The pair wise ranking tool which is used to compare a set of issues and find out which is the most important to participants, was used to rank the most problematic animal species based on the severity posed by each animal species as stated by the participating villagers. To come up with solutions to overcome threats posed by wild animals on crops, attributes of current practices adopted by villagers to overcome this issue, other available practices and proposed new practices to overcome this issue were identified and thoroughly discussed with the villagers. As the next step, a kind of choice experiment study was done again using pair wise ranking method to identify the best solution to overcome the issue. Subsequently a door to door survey was conducted with two sets of questionnaires by the Economic Development Officers of the Galagedra divisional secretariat.

All the survey participants were instructed to give a rough estimate of annual crop damages incurred due to wild animals and the annual expected yield of the crop species mainly in their home gardens. Based on this information the annual amount of damages were estimated and based on current average market prices, the values of the crop damages were estimated.

Results and Discussion

As per the results of the study, people consider Monkey as the most deleterious animal that bring the most damages to their crop, followed by Giant Squirrel, Wild Boar, Porcupine, Peacock and Wild Giant Rat respectively. The pair wise ranking methodology was adopted to evaluate the most deleterious animal, comparing each animal with another. Thus the participants were asked to state the animal most destructive, in terms of the damages done to crops.A sample comprising of 60 villagers was asked to state the more deleterious animal among two animals at a time during the comparison.

The more deleterious animal among the two in each comparison was selected based on majority's view. The pair wise ranking matrix was prepared as above, stating which animal is more deleterious among a pair by using the respective number given to the particular animal along with the percentage of sample members who stated it as the more deleterious animal among two.

Table 1: Most threatening animals on crop damages

	Monkey = 1	Giant Squirrel = 2	Peacock = 3	Wild Boar = 4	Wild Giant Rat = 5	Porcupine = 6	Score	Rank
Monkey = 1		1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	5	1
Giant Squirrel = 2			2 100%)	2 (58%)	2 (100%)	2 (83%)	4	2
Peacock = 3				4 (100%)	3 (67%)	6 (63%)	1	5
Wild Boar = 4					4 (100%)	4 (100%)	3	3
Wild Giant Rat = 5						6 (92%)	0	6
Porcupine =6							2	4

Table 2: Most effective ways to protect crops from Wild Animals

Note: H-High M-Medium D-Difficult V- Very High

Attributes			Method	1=Air Rifle	2=Shot Gun	3.= Poisoning	4= Solar/Bio fence	score	Rank
cost	**implacability**	**Effectiveness**							
H	M	M	Air Rifle = 1		1 (58%)	1 (83%)	4 (63%)	2	2
H	D	H	Shot Gun = 2			2 (55%)	4 (85%)	1	3
L	D	H	Poisoning = 3				4 (92%)	0	4
M	M	V	Solar/Bio fence = 4					3	1

Based on the data collected from the participants; each animal has been ranked from 1 to 6 based on the severity of the crop damage it caused. Thus the animals ranked no.1 monkey and no.6 porcupine, were recognized to be the most and the least deleterious animals respectively. Attributes of each solution was discussed and explained to the participants of the same sample and they were asked to state which solution is more effective when comparing two solutions at a time. As in the above evaluation pair wise ranking method was used to evaluate the best solution.

Table 3: Amount of losses as stated by affected people

Crop	No of trees	Estimated annual yield	Estimated annual damage	Percentage damage	Average unit price	Total Value Rs. Mn
Coconut	1124	115975	63672	35 %	50.00	3.18
Mango	61	14850	11375	43%	30.00	0.34
Plantains	267	8460	4635	35%	100.00	0.46
Jack Fruit	45	1320	760	36%	200.00	0.15
Butter fruit	14	2300	1375	37%	30.00	0.04
Rambutan	148	39360	19900	34%	5.00	0.10
Papaya	53	1640	1125	41%	50.00	0.11
Pineapple	300	300	280	48%	100.00	0.03
Cashew Nuts	8	50	20	23%	400.00	0.01
Cassava	280	1000	700	41%	50.00	0.03
			Average Loss	37%	Total	4.34

In order to obtain the most effective solution, participants were made aware of the attributes of each solution and were required to come out with the best option by comparing each solution with another, adopting pair wise ranking method. Setting up a Solar powered fence was recognised as the most effective way to protect their crop from animals such as wild boar, porcupine. Yet it was discussed that Monkeys and Giant squirrels are capable of avoiding the fence by leaping from one tree to another. Thus a solution was proposed as to cut off the branches of trees or to cut the trees lying on one side of the fence if required, in order to hinder their access across the fence. As this would keep the animals closed in the forest and considering the necessity to have an ecological balance, a bio fence, a fence built up with fruit baring trees was proposed parallel to the solar power fence on the side of the forest. As per the

data gathered from the door to door survey, annually 37 % of home garden crops, worth Rupees 4.34 million is damaged by wild animals in Meegahena Granma Niladari division. In terms of economic value, the biggest damage is done to coconut, worth about Rs. 3.18 million annually, followed by Pineapple, (Rs. 0.46 Mn.) and Mango (Rs. 0.34 Mn.). In terms of monetary value, nearly 73 % of total economic loss was due to the damages caused to coconut.

Conclusion

This survey revealed that on average annually 37% of crops worth Rs. 4.34 million is damaged by wild animals in Meegahahena Grama Niladari division. There are 14,023 Grama Niladari divisions in Sri Lanka and according to the economic survey done by the Department of Census and Statistics in 2014, crop cultivation is practiced in 11,308 Grama Niladari divisions. If the crop damage by wild animals calculated based on the above statistics happens in those Grama Niladari divisions as well, then the loss would be around Rs 50 billion per annum. Therefore further study on this issue is necessary. Constructing a solar powered electric fence surrounding the village is recommended and clearing of trees or branches of trees on one side of the fence is needed to obstruct the crossing of animals from one side to the other. Along with the electric fence, a bio fence comprised of fruit bearing trees towards the jungle is required to maintain the biodiversity and to prevent animals from reaching the village in search of food. Making artificial water holes inside the forest is recommended to lessen the issue further.

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The Effects of Natural Disasters: A Study to Sustain Paddy and other Seasonal Crop Farmers in Sri Lanka

R. D. N. L. Deshapriya, K. A. D. L. Lakpriya, P. M. D. G. T Pathiraja, P. G. N. A. H. Wijesiri and M. D. R. K. Jayathilaka

SLIIT Business School, Sri Lanka Institute of Information Technology Sri Lanka

Keywords: *Natural Disasters; Paddy; Seasonal Crops; Farmers*

Introduction

The United Nations (UN) Development Programme set out seventeen sustainable development goals (SDGs) to be achieved by the UN member countries in 2030. One such goal, SDG 8 is about decent work and economic growth, where the agriculture sector can play a wider role for economic growth by reducing unemployment in the country. Worldwide, various factors can adversely affect many occupations, especially with unfavorable effects on those engaged therein. Previous researchers have shown that natural disasters cause impacts in terms of income volatility, particularly negative income shocks regardless of the cause whereas risks force households in developing countries to lower their expenditure on health and education. Mottaleb et al. (2013) identified natural disasters impacting on household income and expenditure volatilities in Bangladesh as well.

Ministry of Disaster Management (DM) in Sri Lanka identifies flood and drought as the major types of natural disasters affecting Sri Lanka (Karunarathna and Athukorala, 2018). Nevertheless, Tsunami has also been a major issue in the recent past. Its likelihood of occurrence is rather small, but it causes high damage. Ancient Sri Lanka was a country with self-sufficiency. Currently, an open market economy, Sri Lanka's dependency is higher on imports, partly due to insufficient local production. In addition, over the years cultivation has declined due to various reasons. The International Trade Administration (2018) states that in Sri Lanka, over 25% are employed in the agricultural sector, which contributes 6.9 % to Gross Domestic

Production (GDP). This indicates the magnitude of any adverse impacts to the agricultural sector. In Malaysia, Hein (2019) discussed the response to extreme disasters and climate change when the government intervenes to mitigate same and spread awareness of climate changes. However, in Sri Lanka no long term plan is in place to mitigate or at least minimize the effects of natural disasters, which can lead to inequalities in the population. The findings/results of this study can assist Sri Lanka to initiate policies to reduce inequality among farmers, and thereby improve and sustain the agricultural practices in Sri Lanka; and thus to achieve SDG 8 as set out by the UN.

Objective

To investigate the socioeconomic and demographic characteristics of paddy and other seasonal crop farmer households affected by natural disasters in Sri Lanka.

Methodology

This study ascertains the number of natural disasters farmer households have encountered, and socioeconomic and demographic characteristics such as age, gender, religion, marital status among other factors, which vary between affected and non-affected paddy and other seasonal crop farmers. Pearson's Chi-square test identifies significant relationships among variables, if any. STATA 12 software analyzes secondary data collected. Pearson's Chi-square formula is:

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

O = Observed (actual) value
E = Expected value

Data is obtained for Sri Lanka from the Household Income and Expenditure Survey (HIES) 2016.

Results and Discussion

Highest share of farmers with 13.64% for paddy and other seasonal crops are observed in the Kurunegala district and least around 0.72% from the Kilinochchi district; the highest percentage of paddy and other seasonal crop

farmers affected by natural disasters are in the Kurunegala district with 18.74 % and the least affected 0.2 % in the Colombo district.

Table 1: Demographic characteristics of paddy and other farmers

Comparison	Non-affected (%)	Affected (%)	Total (%)
Sector *			
Urban	94.38	5.62	100
Rural	87.42	12.58	100
Estate	97.1	2.9	100
Ethnicity			
Sinhala	87.87	12.13	100
Sri Lankan Tamil	87.24	12.76	100
Other	89.43	10.57	100
Religion			
Buddhist	87.92	12.08	100
Hindu	89.57	10.43	100
Islam	82.05	17.95	100
Roman Catholic	84.96	15.04	100
Marital Status			
Never Married	87.77	12.23	100
Married	87.74	12.26	100
Widowed	89.57	10.43	100
Separated/Divorced	88.89	11.11	100
Average	87.89	12.11	100

Note: * Differences are statistically significant at $\alpha = 0.01$ levels Pearson's Chi-Square.

Percentage of farmers affected in main categories such as flood, drought, landslide, wild animal attack, wind affected, other natural disasters and different combinations of these aspects are relatively higher in the country. Most farmers face wild animal attacks. Animals entering farm land in search of food being warded off by farmers lead to conflicts, and hence victimize farmers. In addition, same farmer would have been affected by two or three disasters; observations are less but occur countrywide. Table 1 demonstrates demographic characteristics of paddy and other seasonal crop farmers between affected and non-affected farmers. Pearson's Chi-Square indicates that there is a significant difference between affected and non-affected farmers based on sector wise distribution. In addition to that, other general demographic characteristics are provided in Table 1 too, but the significance of association among affected and non-affected among the variables is less. Ethnicity,

religion and marital states wise comparison between the affected and non-affected is much more similar.

Conclusion

Between affected and non-affected groups related to demographic characteristics, there is no significant association/relationship among variables. However, sector wise an association/a relationship exists among these two parties. Government of Sri Lanka can focus on uplifting farmers to increase economic growth in the county and achieve SDGs as set out by the UN. Policy makers need to initiate action to mitigate risks and disasters caused by animals, as it is the major threat faced by farmers.

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Cost of the Fertilizer Subsidy for Paddy Farmers: An Empirical Investigation in Sri Lanka

H. K. A. P. Hatharasinghe[1], D. N. T. Jayamanne[2] and W. Athukorala[3]

[1 & 2] PGIHS, University of Peradeniya, Sri Lanka
[3]Department of Economics & Statistics, University of Peradeniya, Sri Lanka

Keywords: *Fertilizer Subsidy; Effectiveness; Paddy Farmer; Sri Lanka*

Introduction

The Government of Sri Lanka has introduced a number of policies and programs to increase paddy production since independence (Athukorala, 2016). Paddy cultivation provides livelihood opportunities for more than 1.8 million farmers in the country. Successive governments have provided support to stimulate paddy production by way of large scale irrigation schemes, land development and settlement schemes, free provision of irrigation water, fertilizer subsidies and guaranteed prices. The Government of Sri Lanka has been subsidizing fertilizer for more than five decades. The main objectives of the subsidy scheme is to make fertilizer available as cheaply as possible in order to encourage its wider use; and thereby increase agriculture productivity, achieve national self-sufficiency in rice and support the livelihoods of paddy farmers. A subsidy scheme for the fertilizers nitrogen (N), phosphorus (P), and potassium (K) was intiated since 1962–89 for paddy cultivation. The new political regime which came into the power in 2015 has introduced a major change to the fertilizer subsidy programme, by shifting from the material fertilizer subsidy programme to a cash transfer programme.

In developed countries, it is generally agreed that fertilizer demand is cost inelastic. This may be due to the lack of an economic substitute for chemical fertilizer. Generally, in less developed countries the demand for fertilizer is thought to be more elastic under the assumption of readily available substitutes such as manure and other organic materials.

Ekanayake (2006) investigated the impact of the fertilizer subsidy on paddy cultivation in Sri Lanka and concluded that fertilizer subsidy is not a key determinant of the use of fertilizer in paddy cultivation. Ramli et. al. (2012) investigated the impact of fertilizer subsidy on Malaysia Paddy/Rice Industry using a System Dynamics Approach. Result indicates that fertilizer subsidy does significantly impact the paddy and rice industry. Rodrigo et al. (2015) found that mechanization prevents overuse of fertilizer and a seed paddy subsidy will ensure self-sufficiency in rice production. However, the subsidy scheme has become a politically sensitive issue in Sri Lanka because the majority voters are rural farmers (Thenuwara, 2003; Weerahewa et al., 2010, Jayne & Rashid, 2013). In this context, a clear understanding about the factors that determine the demand for fertilizer is necessary in evaluating the effectiveness of the fertilizer subsidy scheme implemented by the government of Sri Lanka. However to estimate the cost recovering level of output for paddy, an analysis of government expenditure on fertilizer subsidy on paddy production in Sri Lanka has not been investigated and this study focuses on this issue.

Objectives

The main objective of this study is to estimate the maximum tolerable level of output of paddy if we save the money without giving fertilizer subsidy. It shows the effectiveness of the fertilizer subsidy programme on paddy production in Sri Lanka. The calculation is done after estimating cost recovering levels of output for paddy if fertilizer subsidies are removed in the country. It gives the maximum tolerable level of paddy yield without fertilizer subsidies in the country.

Methodology

Secondary data was used to analyze the results of the study covering the period 2014-2018. To analyze the effectiveness of fertilizer subsidy on paddy, the study used total paddy production (Metric Tons), value of total yields (Rs/million) and fertilizer subsidy expenditure (Rs/million), and measured by the following formula:

$$Y = (X_i * (Z_j/100)) * P_k$$

Calculate until: $Y \geq S_1$

Where, Y is value of paddy with deduction ratio; X_i is annual total paddy production (in MT); Z_j are deduction ratios; P_k is annual price of paddy (Rs/Kg); and S_l is Fertilizer Subsidy Expenditure (Rs/million). The data was collected from many sources: total paddy production from Department of Census and Statistics, annual price of paddy (Rs/Kg) and fertilizer subsidy expenditures from Sri Lanka budget reports, and Gross Domestic Product (GDP) from Annual Reports of the Central Bank of Sri Lanka.

Results and Discussion

Table 1 shows total paddy production from 2009 to 2018 in Sri Lanka. The paddy production shows fluctuations as shown in Figure 1. The fertilizer subsidy is the one of the main factors for the paddy production. The total paddy production in Sri Lanka has shown an increase over history. But according to Figure 1 two major decreases could seen in 2014 and 2017. Over the years fertilizer subsidy expenditure schemes have been changed according to changes in government (Figure 2). Therefore the amount of allocation for fertilizer from the annual budget has fluctuated.

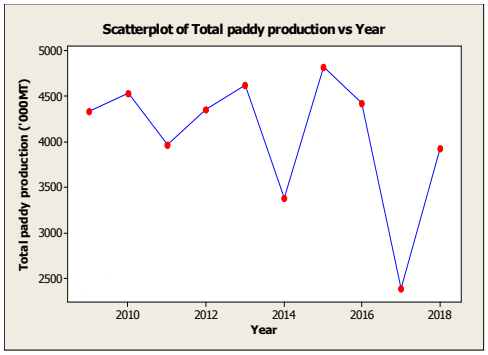

Figure 1: Total paddy production

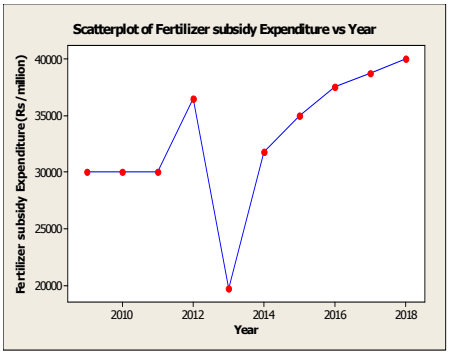

Figure 2: Total subsidy amount

From 2009 to 2018 fertilizer subsidy expenditure as a percentage of the total value of paddy production and GDP are reported in Table 1. In 2017 fertilizer expenditure accounted for 36.13% of the total value of paddy production. It is the highest percentage value during the given period of time and the lowest percentage is 9.48 % in 2013. In 2009 fertilizer expenditure was 0.62% of

GDP, which is the highest value among the considered years. The lowest value is 0.21% in 2013.

Table 1: Total paddy production, its value and fertilizer subsidy expenditure

Year	Total paddy production ('000MT)	Total value of paddy production (Rs/million)	Fertilizer subsidy expenditure (Rs/million)
2009	4,336	195,120	30,000
2010	4,528	203,760	30,000
2011	3,970	178,650	30,000
2012	4,353	195,885	36,456
2013	4,620	207,900	19,706
2014	3,381	152,145	31,802
2015	4,819	216,855	35,000
2016	4,420	198,900	37,500
2017	2,383	107,235	38,750
2018	3,930	157,200	40,000

Source: Central bank

We next estimated the maximum 'tolerable' level of paddy output which is similar to the cost of subsidies. These estimations are reported in Table 2. According to the analysis (Table 2) in 2014 fertilizer subsidy expenditure met 79 % deduction from the total paddy production. That means with 21% of the total paddy production in Sri Lanka, the government can sufficiently cover their fertilizer subsidy expenditure. When 83 % deducted from the total paddy production in 2015 the Sri Lankan government could carry out the total expenditure of the fertilizer subsidy; i.e. with 17 % of total paddy production the government could cover the financial requirement of the total fertilizer subsidy expenditure**.** Deduction of 81% from total paddy production in 2016 is sufficient for the government to fulfill their expenditure on the fertilizer subsidy scheme; or 19 % of total paddy production could provide the expenditure requirement of the total fertilizer subsidy.

Table 2: Fertilizer Subsidy Expenditure as a percentage of total value of Paddy production and GDP

Year	Fertilizer subsidy expenditure as percentage of total value of paddy production (%)	Fertilizer subsidy expenditure as percentage of GDP (%)
2009	15.37	0.62
2010	14.72	0.53
2011	16.79	0.42
2012	18.61	0.42
2013	9.48	0.21
2014	20.90	0.31
2015	16.14	0.32
2016	18.85	0.31
2017	36.13	0.29
2018	25.44	0.28

In 2017 there was a considerable fluctuation in ratio of reaching the expenditure of fertilizer. It took a deduction of 64 % from total paddy production to reach the required fertilizer subsidy expenditure. In 2018, the requirement of the fertilizer subsidy was achieved by reducing 74 % from total paddy production; in other words 26 % of total paddy production has satisfied the requirement of covering total fertilizer expenditure.

Conclusion

In 2014 maximum tolerable level of the gain for the total fertilizer subsidy expenditure is 21% from the total paddy production. This implies that the amount of maximum tolerable level of yields with the absence of the fertilizer subsidies in the country that year was 79 % of the total yield. Accordingly if government does not provide the fertilizer subsidy, its total saving is approximately Rs. 32 billion which is similar to the value of 21 % of total paddy production. This tolerable level of yield is 19 %, 36 % and 26 % in 2016, 2017, and 2018, respectively. It is evident that this level has been significantly different in different years due to changes in the subsidy amount granted and total paddy yield in the country. In general the amount of subsidy granted is mainly determined by the land extent cultivated in each year. Therefore, it is important to take into account the results of this study in order to identify the effectiveness of providing such a subsidy scheme. When

considering the period from 2014 to 2018 the results clearly show the maximum levels of possible yield loss that could be tolerated if the government remove fertilizers subsidies in the country. This results can be used to design necessary policies for the paddy farming sector in Sri Lanka.

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Appendix

Table 3: Estimating tolerable level of output

2014		2015		2016		2017		2018	
Deduction ratio	Value of paddy with deduct rates (Rs/million)	Deduction ratio	Value of paddy with deduct rates (Rs/million)	Deduction ratio	Value of paddy with deduct rates (Rs/million)	Deduction ratio	Value of paddy with deduct rates (Rs/million)	Deduction ratio	Value of paddy with deduct rates (Rs/million)
10	136,930	10	195,169	10	179,010	10	96,511	10	141,480
20	106,5015	20	173,484	20	159,120	20	85,788	20	125,760
30	1,065,015	30	151,798	30	139,230	30	75,064	30	110,040
40	91,287	40	130,113	40	119,340	40	64,341	40	94,320
50	76,072	50	108,427	50	994,500	50	53,617	50	78,600
60	60,858	60	86,742	60	79,560	60	42,894	60	62,880
70	45,643	70	65,056	70	59,670	63	39,677	70	47,160
78	33,472	80	43,371	79	41,769	**64**	**38,605**	**74**	**40,872**
79	**31,950**	**83**	**36,865**	80	39,780	65	37,532	75	39,300
80	30,429	84	34,697	**81**	**37,791**			80	31,440

Evaluation of Required Contribution by Residents and Other Entities for Solid Waste Collection: A Study in Kandy Municipal Area

S. Rathnayake and M. Bandara

PGIHS, University of Peradeniya, Sri Lanka

Keywords: *Solid Waste; Residents; Management; Kandy*

Introduction

Municipal solid waste (MSW) is a popular topic in many countries. Management of solid waste has become a broad subject in today's world. Industrial development can be considered a major reason for the increase of solid waste generation in the form of polythene, plastics, and various durable disposals. Solid waste or municipal solid waste can be defined as materials generated from the result of daily human activities in places like households, public places and city streets, shops, offices and hospitals. It can be further defined as any unwanted material intentionally thrown away for disposal (Karunarathna, 2015). Accordingly the management of MSW is defined as the discipline associated with the control of generation, storage, collection, transport or transfer, processing and disposal of solid waste materials in a way that best addresses the range of public health, conservation, economic, aesthetic, engineering and other environmental considerations.

Techniques used to solve the MSW problem varies from country to country. Developed countries use advanced techniques such as recycling, reusing, etc. Underdeveloped and developing countries apply open dumping techniques. However, dumping cannot be considered an appropriate way to solve the MSW problem. During the last two decades, European Union legislation has put increasing pressure on member countries to achieve specified recycling targets for municipal household waste (Xiaoyun, 2015). Sri Lanka still has a very poor system of managing municipal solid waste (MSW). The most common method of MSW disposal still remains to be open dumping (Bandara, 2011).

According to the provisions of the Local Government Act, the Local Authorities (LAs) in Sri Lanka are responsible for the collection and disposal of waste generated by people within their territories. Necessary provisions have been made under sections 129, 130 and 131 of the Municipal Council Ordinance; sections 118, 119 and 120 of the Urban Council Ordinance; and sections 93 and 94 of the Pradeshiya Sabha Act. The National Environmental Act (NEA) of 1980 which was subsequently amended in 1988 provides the necessary legislative framework for environmental protection in the country. The National Strategy for Solid Waste Management (NSSWM) put out by the Ministry of Forestry and Environment in 2002 endorsing the need for integrated solid waste management provides overall guidance for the management of the country's solid waste (Bandara, 2011). The Kandy municipal area, which is highly urbanized, generates huge amounts of solid waste. This area consists of 28.53km^2 of land. According to a 2012 survey, there are102, 500 permanent residencies in the area and 400,000 people enter the city daily for their requirements. The main MSW dumping site is located at Gohagoda.

Objective

The main objective of this study is to calculate the required contribution by residences and other entities to ensure the proper treatment of solid waste without being a burden to public funds of Kandy Municipal Council.

Methodology

The methodology of this study is based on survey data collected by the Kandy Municipal Council (KMC) Solid Waste Management Department from 2012 up to 2018. Based on the survey data, we calculate the average monthly solid waste generation at household level and for other entities. Then based on the average generation of solid waste, we estimate the average contribution by SWM service receivers. To estimate contribution, data was collected based on budgetary expenses such as wages, maintenance, marketing and purchases of the Department and income generated through various means of SWM are also taken into consideration for the actual cost for SWM.

Results and Discussion

Solid waste generation and collection in KMC area are separated into six zones for ease of management. There are staff and resources allocated to each area under the Solid Waste Management Department of KMC. Table 1 below shows average monthly solid waste generation. It has been calculated through a survey conducted by KMC and using their available data assuming that the rate of increase of solid waste generation is equal. We are considering the generation of solid waste by households, businesses and other institutions. Therefore we have divided the generation of solid waste into two categories as household and other institutions. Then we calculate solid waste generation according to the zone.

Table 1 Average monthly generation of solid waste

	Number of households	Solid waste generation (Kg)	Number of Businesses and other Institutions	Solid waste generation (Kg)
Zone 1A	1,412	63,087	3,067	2,194,074
Zone 1B	4,126	162,590	473	414,042
Zone 2	5,357	215,939	544	380,243
Zone 3	5,255	284,396	961	587,974
Zone 4	4,761	227,946	1,324	531,055
Zone 5	4,652	194,224	222	33,852

Note: Solid waste generation of businesses and other institutions include hotels, shops, private and government institutions, schools, hospitals and religious places.

Then based on average daily generation, we have calculated monthly solid waste generation according to the zone by household and other institution categories as indicated in Table 2. Total number of solid waste tons per month as well as the zone wise solid waste generation has been calculated in this table for further analysis. There are several modes of income generation by solid waste management such as Gully service charges, Sampath piyasa income, refused rubbish charges, extra solid waste disposal charges, income for sale of plastic cubes, and income from selling compost. Likewise the total calculated income is Rs. 19,819,316.00 (Rs.19 million) and monthly average income is Rs. 2,202,146 (Rs. 2 million).

Table 2: Average monthly cost estimation for households and other entities

	Cost per household (Rs.)	Cost per Business or other entity (Rs).
Zone 1A	302	4,840
Zone 1B	267	5,922
Zone 2	273	4,729
Zone 3	366	4,139
Zone 4	324	2,713
Zone 5	282	1,032

Note: These costs for the KMC or contribution by service receivers are estimated using solid waste collection data, cost of dumping them under present rate and number of HHs/institutions in each zone as well as the income generated by several means.

Costs such as labor, machinery, advertising and community activities are incurred when implementing proper management of solid waste in Kandy Municipal Council area. Those costs are taken into consideration when calculating the average monthly cost for solid waste management which is Rs. 38,788,194 (Rs. 38 million). Then, the net loss for solid waste management is calculated by deducting average monthly income from average monthly cost which equals Rs. 36,586,048 (Rs. 36 million) per month. After that, the average cost per solid waste kilogram is calculated by dividing the monthly average loss by monthly average solid waste collection and that is 5,408,137 kg (5.4 MT) which equals Rs.7 per kilogram. Monthly cost for the household unit and businesses and other institutions are calculated based on the average percentages calculated for cost per household unit and shown in Table 6.

Conclusion

Solid waste management incurs huge costs for operation and maintenance of facilities. A municipality's solid waste expenditure can be analyzed most simply by its average cost. Average Cost requires that the service be divided by some metric, usually tons or number of household units. There is a cost that cannot be recovered from solid waste or solid waste management by KMC. Therefore that net loss from solid waste management which is Rs. 36,586,048 is covered by other tax revenue of the KMC. Therefore it should be taxed as environment tax from both households and businesses and other institutions

separately in this study. The institutions can be further divided into hotels, private and government institutions, shops, religious places, hospitals, etc. Future studies could improve the analysis further by estimating their contribution according to the type and magnitude of institution. Though the budget has allocated provisions for municipal solid waste management, there are an ineffective/inefficient implementations of the rules to get community participation for solid waste management. There should be a mechanism to influence community to reduce their waste by sharing cost with them for their waste generation which will be more effective on solid waste reduction as well as the management in future.

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Recreational Activities and their Impact on Poverty in Sri Lanka

B.G.D. U. I. Gamage, G.P.D.P.G. Geethanjana, L.G.S.H.M. Karunarathne, R.M.H.T. Rathnayaka and M.D.R.K. Jayathilaka

SLIIT Business School
Sri Lanka Institute of Information Technology, Sri Lanka.

***Keywords**: Recreational Activities; Poverty; Probit Model;*

Introduction

Poverty is one of the major challenges the world faces, with massive implications that hinder sustainable development. More than 4.3 billion people out of the global population of 7.5 billion are in poverty, affected mostly from causes which are preventable with low cost and proven interventions (UNICEF, 2010). Statistics reported by the Department of Census and Statistics (DCS, 2016) indicates that 169,392 households and 843,913 persons live in poverty in Sri Lanka. Furthermore, the mean monthly income was Rs. 62,237, while the mean monthly household expenditure on recreational activities was only Rs.908 (2.5 % of total non-food expenditure).

The literature has focused extensively on income and expenditure patterns and recreational activities, and how it can affect the level of poverty. As stated by Chacón-Araya and Crow (2015), since 1988, expenses associated with recreational and leisure activities was slightly high for people in the lowest and highest income quantiles. Heckman model and Probit analysis used by Haq, et al. (2018), pointed out that the probability of the household contribution for leisure and tourism increased with favorable changes in income, level of education and women's empowerment. Similarly, household spending on tourism is influenced positively by the age of the head of household and negatively by the number of children and adults in Pakistan. However, even though there are numerous studies conducted on poverty, there is no significant study on recreational activities and their impact on poverty in Sri Lanka. As such, this study addresses this research gap, by highlighting the significance of recreational activities with in-depth insights. The new findings gathered from this research will be of immense use to Government of

Sri Lanka in formulating better policies for entrepreneurs in the business sector, who are one of the stakeholders in recreational activities in the country. Furthermore, this is an opportunity for all national stakeholders to discover untapped market segments. Thus, these insights are important for investors in the social sector including leisure and entertainment industries, covering cultural and religious activities too.

Objective

The main purpose of this study is to measure the impact of recreational activities on poverty in Sri Lanka.

Methodology

Research suggests measurement of the probability of being in the category of poor or nonpoor based on different types of recreational activities of Sri Lankan households. As such, this study is based on secondary data gathered through the DCS, with an annual sample of 21,756 households representing all 25 districts in the country. Studenmund (2016), recommends the main probit model which is appropriate for this study. Probit model is a linear probability model where the binary variable (dependent) has two possibilities such as being nonpoor or poor. It has a parameter that reflects changes in the probability of being poor to the changes in explanatory variables. This model consists the binary dependent variable (Z), taking value 1 if the family unit is poor[23] and 0 otherwise.

$$Z = \beta_0 + \beta_1 \text{MHH} + \beta_2 \text{AHH} + \beta_3 \text{POlder} + \beta_4 \text{EHH} + \beta_5 \text{MHH} + \beta_6 \text{EMHH} + \beta_7 \text{Urban} + \beta_8 \text{Rural} + \beta_9 \text{Enter} + \beta_{10} \text{Religious} + \beta_{11} \text{Cultural} + \beta_{12} \text{Cultural} + \beta_{13} \text{Recreational} + u$$

The variable MHH is a dummy variable equal to 1 if the household is male headed household, 0 for female headed household. AHH denotes the age of the household head. POlder is a ratio of household members who are above 65 years old to the total household members. EHH represents the education level of the household, MHH is the marital status of the household and EMHH denotes employee status. The variable Urban is a dummy variable equal to 1

[23] People who are living below the national poverty line (Rs. 4166 per month) are defined as poor and the rest are as non-poor.

if the household located in an urban area, 0 otherwise. Rural is a dummy variable equal to 1 if the household located in a rural area and 0 for others. Enter (Entertainement), Religious, Cultural and Recreational variables denote the total real expenditure values.

Results and Discussion

The coefficient of types of recreational activities reveals that entertainment, religious, recreational and cultural activities have negative effects on being a poor household and those recreational activities are significantly associated with poor households. The marginal effect shows that spending on entertainment activities have a much higher probability of being in a poor household by 0.004 percentage in points compared to other recreational activities. Moreover, spending on religious activities demonstrates a lower probability of being in a poor household by 0.0006 percentage in points compared to other activities. Further, spending on recreational and cultural activities exhibits equal probability of being in a poor household by 0.003 percentage points, respectively.

Table 1 reports the marginal effects of the estimated model. Accordingly a 1% increase in the education level of the household head decreases the probability of being in a poor household by 1.86 percent in points. As can be seen from the table, the highest proportion of poor (75.3%) live in the urban sector compared to those living in the rural sector. This indicates that about 25% of households in the urban sector and about 60% of rural households are nonpoor.

Table 1 Estimated results of the probit model

Variables	Estimates	Robust SE	Marginal effect (in percentage)
Constant	-0.9984	0.1368	
Socio-demographic characteristics			
Male_HH	0.05074	0.0522	0.0985
Age_HH	-0.00198	0.0018	-0.0040
% Older(above 65)	0.03398	0.0642	0.0697
Education_HH	-0.51250***	0.0709	-1.8612
Marital Status_HH	0.20743***	0.0532	0.3632
Employee Status_HH	-0.05085	0.0484	-0.1042
Location			
Urban	-0.57333***	0.0945	-0.7528
Rural	-0.17288***	0.0735	-0.3941
Recreational Activities			
Entertainment	-0.00179***	0.0002	-0.0036
Religious	-0.00029**	0.0001	-0.0006
Cultural	-0.00140***	0.0004	-0.0028
Recreational	-0.00137***	0.0005	-0.0028
Number of observations = 21756			
Pseudo R^2 = 0.0889			
Log likelihood = -2917.645			

Note: *** significant at the 1% level, ** significant at the 5% level.; HH – Head of Household

Conclusion

This study measures the impact of different types of recreational activities and how socio-economic and demographic conditions of Sri Lankan households influence country's poverty levels. The Probit model identifies the nature of relationship between the recreational activities and level of poverty. The findings of this study demonstrate that spending on recreational activities are significantly associated with nonpoor households. Accordingly, a strong relationship exists between spending on recreational activities and nonpoor households. Furthermore, households who are located in the urban sector have

a much higher probability of being poor compared to those living in the rural sector. This study further confirms that education and marital status of the head of the household are significantly associated with poverty alleviation. Therefore, this research study provides the opportunity to both investors and policy makers (targeting the social sector including leisure and entertainment industries, covering cultural and religious activities), to further explore nonpoor households and their impact on recreational activities. Thus, it contributes towards Sri Lanka's sustainable development.

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Green Accounting and Sustainability Practices in Sri Lankan Garment Industry

K. A. G. K. Karunanayke, N. Serasinghe, P. A. D. S. Himasha, S. A. T. Senadheera and H. W. M. Weligodapola

SLIIT Business School
Sri Lanka Institute of Information Techology, Sri Lanka

Keywords: *Green Accounting; Garment Industry; Sustainability; Sri Lanka*

Introductıon

The main aim of this research is to study the green accounting practices which contribute to sustainable development of the garment industry. Green accounting considers environmental costs in the accounting system, which is neglected in the current accounting system. Therefore, the accounting system should be revised taking environmental costs into consideration (Blowfield, 2013). The existing literature motivates the research. Pollution control, sustainable development, projection, cost, estimated life in the environment, product circulation, environmental-centered management systems are main benefits one can get by using green accounting practices (Disanayake, not dated)**.** Reduction of power intake, renewable electricity, reduction of water consumption, reduction of noise pollutants are some of the sustainable production techniques. Two of the main companies in Sri Lankan's garment industry, MAS Holdings (Pvt) Ltd and Brandix Lanka Ltd were selected for the study.

Objective

The main objective of this study is to identify different types of green accounting practices and sustainability activities which will optimise the use of resources and affect the environment in a socially beneficial manner.

Methodology

The sample of this study consists of two main companies in the Sri Lankan garment industry. In order to collect data, researchers visited these two companies and interviewed the management. Collected data about green accounting practices were analyzed with the help of wordcloud technique and the data about sustainability activities were analyzed through content analysis.

Results and Discussion

MAS holdings (Pvt) ltd: After analyzing the word cloud software, 'Material', 'Renewable energy', 'Biodiversity program', 'Waste Management Project' and 'Chemicals' were identified as the main key terms. The respondent said that these practices are carried out in their industry under the areas of water, waste and energy which were identified as other main keys from word cloud.

Energy – The Company uses advanced technological tools to reduce wastage. Furthermore, MAS is planning to expand the value as either resources or raw materials. MAS Holdings uses many different ways to reduce energy intensity such as Change from CFL bulbs to LED, Change form air cooling machines to water cooling machines. The building of Methliya is made of glass, so the company saves electricity on for lighting, and instead obtains sunlight from nature.

Chemical - As per the explanation of the respondent, chemicals would pollute the environment; but MAS always attempts a standard method instead of releasing those hazardous chemicals to the environment.

Wastage - Methliya has decided on 0 % landfilling from the beginning itself. The wastage of textiles is reduced through the usage of the rays from Holcim. Although this incurs a high cost, they attempt to destroy the textile wastage in a sustainable manner.

Water- In MAS branches they implement Anaerobic and Aerobic water treatment plants and reuse water for gardening and washing plates. They also use sensor taps to avoid wastage.

Brandix Lanka: Wordcloud pointed out the words - water, energy, waste and emission. Those are the areas Brandix covers in their practice of Green Accounting.

Water - Recycling of water waste can be recognized as an essential water management strategy of Brandix. Moreover, Brandix had made considerable effort to implement the company's processes to reclaim as well as to reuse the water. The water that cannot be reused is directed to an on-site water treatment plant. Furthermore, Brandix has also started to concentrate on rainwater harvesting techniques and boost liter capacity by 400 million at the Apparel Park of Brandix in India.

Energy - Energy can be defined as one of the important environmental concerns and Brandix gives considerable attention to regulate the company's consumption level. The overall objective of Brandix is to develop the intensity parameters of the Group's energy. In Sri Lanka, Brandix has transferred to biomass whenever it is possible, and ultimately uses coal when there is an inadequacy of a sustainable supply of biomass. Apart from that, it is important to mention that in India, there is a drive for use of biofuel resources in order to meet their whole energy requirement. Currently in Brandix, branches at Koggala and Batticaloa generate sufficient solar power to meet 10% of the group annual energy consumption. In Batticaloa branch brandix has installed Sri Lanka's largest roof top solar power system.

Energy - Basically the energy consumed by Brandix in their day to day operations incurs more than 90% of the company's greenhouse gas emissions. That's why the company is dedicated to decrease the emission from their operations. Brandix belives that this is the best way for them to contribute to the global campaign in order to reduce the risks of climate change and global warming.

Wastage - Brandix always focuses on the food and fabric wastage of the company. They seek to accomplish a zero wastage to the landfill for the whole company by 2020. They also ensure that 100% of rubbish generated by the company is discarded in this way.

Company A: As the sustainability activities in company A they have a long-term ongoing project with Dedigama primary school about the safety and did a tree planting programme. Company A renewed the entire hospital at Alawwa and made a garden there and did a planting programme. Company A continues with a biodiversity project, and also continues sustainability activity. It produced the Sri Lankan cricket jersey using needles, which are made using polythene and plastics, found at the beach. MAS holdings conducted a biodiversity project.

They have determined to grow the trees as at the area they lived in 2017; ten times of that in 2020 and 100 times in 2025.

Table 1: Sustainability activities

Company A	Company B
• Projects for schools • Projects at hospitals • Biodiversity project • Grow a forest and turn an economic zone green	• Blood donation programme • Project for student • Upgrading the water quality of Kelani river

Company B: Company B as pre sustainability activities, are doing blood donation and conducting a programme that gives academic facilities like giving books, required stationaries to the children of their associates. Also company B is upgrading the water quality of Kelani River with the support of government bodies like IOCM and provide water well facilities for remote villages.

Conclusion

As per the exploration in most of the articles, this research was also the topic "Environmental Management Accounting" and a few were available under the topic "Green Accounting". Most of the articles elaborated on Environmental management accounting practicing in areas like water, energy, material, carbon. Those using green accounting practices under these areas are - water treatment plant, solar plants, rain water harvesting techniques, biomass boilers and furthermore. The researchers have focused only on Garment industries and would like to recommend spreading the future studies towards the other industries.

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The Socio-Economic Consequences of Post-consumed Polythene: The Case of Western and Uva Province

A. Shantha

Department of Economics and Statistics
Sabaragamuwa University of Sri Lanka

Keywords: *Polythene; 3R Concepts; Waste Composition; Multi Criteria Decision Analysis and Incineration*

Introduction

Rapid urbanization and changing income patterns lead to changes in consumption patterns and life styles resulting in the generation of plastic and polythene wastes which exceed the assimilation capacity of the environment for natural decomposition. It is estimated that about 160,000 tons of plastic raw materials and products are imported and out of this 30% has been exported as finished products, with the remainder used in the local market. In Sri Lanka, dumping takes place of one million sachet packets - be it with sauce, jam or shampoo – and 20 million polythene bags and 15 million lunch sheets landfill per day (Dangalla, Chandrasena, Semasingha, & Amarasingha, 2013). The Colombo municipal Council collects 700 tons of garbage on average per day and 10 percent of this is polythene and plastic waste. Although the share of polythene and plastics in Municipal waste is only about 10 per cent of the total solid waste, its environmental impact is much greater than the other waste material. In 2025 annual imports of plastic would reach 430,000 metric tons and out of that 310,000 metric tons would be consumed locally (Gunarathna, 2010). Also in 2025 the estimated recycling capacity would be around 220,000 tons with about 50,000 tons (23% of the wasted) would not being recycled (Kokusai Kogyo, 2016).

Local Government Authorities in Sri Lanka are statutorily responsible for the management of waste generated within their respective boundaries. Most of the post consumed plastic and polythene in local authorities becomes Municipal waste component due to the limitations of open dumping with limited home land in urban and municipal areas. The literature proposes

recycling to minimize the negative externalities of post-consumed plastic, and policy makers have taken some action to enhance the plastic and polythene recycling process in the country. However, most of the post-consumed plastic and polythene ends up with open dumping, land filling or open burning causing with many negative externalities to the environment. Further, local recyclers also not much motivated to enhance the recycling process due to a very slim profit margin. Thus the present plastic waste management system in Sri Lanka is not sustainable. However, research conducted in this area to explore sustainable plastic waste management in Sri Lanka is inadequate. Therefore, this study aims to develop a proper model for plastic waste management practices in Sri Lanka.

Objectives

The main objectives of this study are to develop a predictive model for waste generation pattern, waste composition and waste management; and to accurately estimate the existing post-consumed plastic and polythene. In addition this study is observes the existing behavioral pattern of waste management practices and determinent factors which are affect current practices while examining how behavior change can take place among Sri Lankan consumers to ensure the disposal of plastic and polythene waste without harming the environment.

Methodology

In this study the term “Solid Waste” is defined as nonliquid material that no longer has any value to the person who is responsible for it. According to this definition the materials still reflecting economic value are not considered as waste. Especially reusable and recyclable materials do not come under the waste category. Further, in this study the 3R concept, to reduce, reuse, and recycle, classified accrding their hierarchy level in waste management options, was employed. Waste management hierarchy is instrumental in the concept of sustainability and Integrated Solid Waste Management. The hierarchy of waste management principles has been set up as: waste prevention minimization, re-use, recycling, incineration and disposal (Kirkpatrick 1992). At the top of the hierarchy stands waste minimization as the most desirable option.

For this study, out of 235 local Authorities (23 Municipal Councils, 41 Urban Councils and 271 Pradeshiya Sabhas) 48 local authorities from Western Province and 28 local authorities from Uva Province were considered as the field research areas to collect primary data. The Western Province is the largest which accounts for 33% of total waste generation and Uva Province is the smallest which shares only 5% of the waste generation of the country. Sample size was 4,000 households and it was proportionately (based on number of households) distributed among 76 local authorities in Western and Uva provinces. Sample selection was done based on simple random sampling methods comprising high, low and medium-income levels. The study used Multi Criteria Decision Analysis (MCDA) tools for data analysis. MCDA tools utilize various optimization algorithms to rank options, selecting a single optimal alternative or differentiating between acceptable and unacceptable alternatives. (Kalini, 2013). The study used PROMETHEE (Preference Ranking Organization Method for Enrichment Evaluation) for finding the behavioral pattern of existing waste management practices. A multiple regression model was applied to determine the factors which currently affect present post consumed plastic and polyethene waste management practices. Descriptive statistics were used to develop a predictive model for waste generation pattern, waste composition, waste management, waste characteristics and accurate estimation of existing post-consumed plastic and polythene.

Results and Discussion

Table 1 shows the average of polythene usage and sources of generation level of a household in both provinces. In Western Province (WP) more than 71% polythene was generated due to super market (SM) purchasing process and for the Uva Province (UP) that figure was only 21% and it shows that urban areas create more polethene wastes. In WP, per-household polythene usage was 0.32 kg per month and in UP, 0.22 kg per month. The major source of polythene generation is small scale boutiques in UP.

Table 1: Per HH polyethene usage and sources of generation

			Sources of Generation					
Province and District	Sample size	Per HH Polyethene Usage (kg/Month)	With food items buying from SM (%)	With textile item buying from SM (%)	With durable items buying from SM (%)	With small scale boutique (%)	Direct HH purchased (%)	Other sources (%)
Western Province	3,284	0.32	71	15	5	3	3	1
Gampaha	1,294	0.31	68	18	6	4	3	1
Colombo	1,303	0.34	74	14	5	3	2	1
Kalutara	687	0.29	70	15	7	3	3	1
Uva Province	716	0.21	22	21	13	34	6	2
Badulla	460	0.22	22	22	13	35	6	2
Moneragala	256	0.19	24	21	14	32	7	2

As described in Table 2, the study identified seven alternative management options for post-consumed polythene, with incineration being the most popular option in both provinces. The second management option was handing over to the local authorities and open dumping in WP and UP, respectively, while the third options were, respectively, open dumping and landfilling. Bad management practices, which are incineration, landfilling and open dumping comprise around 63% for WP and more than 80% in UP. These findings indicate how present practices in the post consumed polythene waste management process in the country damages the environment. According to the analysis, the household's attitudes and behavior on post consumed polythene management is backward, since the average score in 3R process (reduce, reuse, and recycle) is negative. The average score in bad practices reflects moving towards environmentally harmful management practices in both provinces. According to the regression analysis, good practices of polythene waste management (reduce, recycle and reuse) significantly depend on the level of education, knowledge on environmental protection, family income, size of the homestead and existing waste management facilities. Polythene usage by household significantly depends on family income, level of education, type of employment, purchasing behavior and distance to supermarket and main city.

Table 2: Existing management options of post consumed polythene

	Existing Management Options						
Province and District	Reuse (%)	Handing over to Recycling Centers (%)	Handing over to Local Authorities with home wastes (%)	Handing over to private collectors (%)	Incineration (%)	Land filling (%)	Open dumping (%)
Western Province	5	6	23	2.7	38	12	12
Gampaha	4	9	20	2	43	14	12
Colombo	5	5	28	4	31	9	18
Kalutara	4	4	21	3	43	13	12
Uwa Province	7	0	7	3	40	14	28
Badulla	6	0	8	3	39	15	28
Monaragala	7	0	6	2	41	14.	29

Conclusion

It is evident from the study that composting is a nationally attractive and practically implementable solution to the post consumed polythene waste management problem in Sri Lanka. Further, it is important to conduct a national level survey to identify the present usage of polythene, sources of generation and waste management practices which is timely to develop a national level policy framework for a post consumed polythene waste management model for each province. Since the attitudes on well known good practices such as reuse, reduce and recycle were significantly backward, relevant authorities must focus on possible awareness programmes for enhancing 3R related activities. Conversely, all bad practices, which are currently popular among households such as incineration, landfilling and open dumping need to be controlled in formulating a new law and order program and changing the consumption pattern of polythene with awareness programmes. In an environmental perspective, this problem will be one of the most challenging issues in the country during the next few decades.

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Impact of Socioeconomic Factors on Solid Waste Management in Matale Municipal Council area

K. Kumudhini and A. S. P. Abhayaratne

Department of Economics & Statistics, University of Peradeniya, Sri Lanka

Keywords: *Solid Waste; Management; Socioeconomic; Matale*

Introduction

Solid waste management refers to the supervised handling of waste material from generation at the source through the recovery processes to disposal (Glossary of Environmental Statistics, 1997). Urban solid waste management is considered to be one of the most serious environmental problems confronting urban areas in developing countries. At present, solid waste is being dumped in environmentally very sensitive places. Haphazard throwaway and dumping of solid waste reduce aesthetic value and scenic beauty of the environment thereby creating negative visible impacts to human beings and adverse effects on tourism. The current waste production levels on a global scale amount to 1.3 billion tons per year with 3 billion residents producing approximately 1.2 kg per person per day (World Bank, 2012). However with rapid urbanization urban populations are anticipated to increase further by 1.3 billion to 4.3 billion residents by 2025. Consequently waste generation trends will also increase from 1.2 kg to 1.42 kg per person per day by 2025 while annual waste generation levels increase to 2.2 billion tons respectively (World Bank, 2012). Ranathunga et al. (2016) carried out a research on socio economic determinants of household solid waste management in Kandy Municipal area.

Municipal solid waste is a growing problem in Sri Lanka, especially in the urban areas. This problem is aggravated due to the absence of a proper solid waste management system in the country. As a result, solid waste is openly dumped in a few chosen locations in the towns. The Matale city struggles with a number of challenges linked to solid waste management, which is a core responsibility of the Matale Municipal Council. Approximately 30–32 tons of wastes are generated per day in the city. Waste collection tends to be low,

although 20 percent of the municipal budget is spent on solid waste management. Collecting 1 ton of waste costs around 30 US $. The generated solid wastes from the Matale Municipal Council are dumped at the Wariyapola solid waste dumping site (Annual Report, MMC). Practices in Sri Lanka reflect a lack of knowledge of sustainable solid waste management practices. This study is an attempt to address this gap by focusing on the socioeconomic factors which influence waste mangment practices in the Matale Municipality limits.

Objective

The objective of the research is to identify the socio economic factors affecting solid waste management in Matale Municipal Council area.

Methodology

This study uses both primary and secondary data. The primary data is mainly used to measure the impact of socio economic factors on solid waste management. Matale Municipal Council (MMC) area was selected as the study area based on the purposive sampling method. Matale is a medium-sized town in the Central Province of Sri Lanka, with an annual population growth rate of 1.5 percent in 2015 (MMC report, 2016). Secondary data was collected from the MMC waste management database and Matale Divisional Secretariat Reports. In this study, two regression analyses were carried out separately as suggested by Sankoh et al. (2012), and Ranathunga and Sri Ranjith (2016). Accordingly the OLS multiple regression model and a logit regression model were used to analyze the data. Nearly 1,500 families live in the MMC area and approximately 500 families supply garbage to the MMC. Out of this, 50 families were selected as the sample by using the stratified random sampling method. We first used a multiple regression model to study the solid waste management practices of household (Wi) against the weight of the solid waste per day (Wei_i), household income (Inc_i) family size ($fams_i$) working hours (ws_i) and the size of the land (ls_i) to help identify the factors affecting solid waste management. The model is given below.

$$W_i = \beta_0 + \beta_1 Wei_i + \beta_2 Inc_i + \beta_3 fams_i + \beta_4 ws_i + \beta_5 ls_i + u_i$$

Second, a logit model was used to study Willingness to Pay of the households for a better solid waste management system. Willingness to pay (WTP) was

regressed against household income (Inc_i), family size ($fams_i$), educational level of matriarch (edu_i), Working hours per week (ws_i) and the size of the land (ls_i).

$$WTP_i = \beta_0 + \beta_1 Inc_i + \beta_2 fams_i + \beta_3 edu_i + \beta_4 ws_i + \beta_6 ls_i + u_i$$

According to the MMC report a household should pay Rs. 2,700/= per month to implement better solid waste management practices. This research uses 'willingness to pay' for solid waste management and it uses the contingent valuation method. Correlation coefficient analysis and regression analysis are used for the evaluation.

Results and Discussion

It was clearly identified that the weight of solid waste, income of household and family size are significant under the 5% significance level and which positively affect solid waste management practices. This model explains 88% of the variation in the dependent variable. The results of the estimated logit model explains that income of household and family size are significant under the 5% significance level and positively affect the willingness to pay.

Table 1: Results of multiple regression model (OLS)

variables	Coef.	t	P>|t|
Wei	0.11747 (0.022)	5.23	0.000**
Inc	0.00002 (9.40e-06)	2.96	0.005**
Fams	0.29480 (0.116)	2.53	0.015**
Ws	-0.01818 (0.018)	-0.97	0.336
Ls	0.12132 (0.079)	1.54	0.132
Cons	-0.94688 (0.282)	-3.37	0.002

**,* denotes significance at 5%, 10% level R^2 = 0.8837 No of observations= 50

Table 2: Results of Logit Model

WTP	Coef.	P>|z|	dy/dx	Average	Odds ratio
Income	0.0002 (0.00)	0.046**	3.48e-06	37660	1.00
Family size	3.33 (1.54)	0.031**	0.0627	4.42	17.40
Working hours	-0.15 (0.185)	0.396	-0.0062	6.32	0.75
Land size D1*	0.94 (0.95)	0.323	-0.0031	2.1	0.86
Constant	-18.7123 (8.12)	0.021	0.022	0.7	2.30

(*) dy /dx is for discrete change of dummy variable from 0 to 1.

Therefore, Household Income, Weight of Solid Waste and Family Size are the factors impacting on solid waste management. The odds ratio of household income and family size is 1.000158, 1740154 respectively. It is greater than 1. This implies that these two variables have a positive relationship with willingness to pay

Conclusion

In researching the Matale Municipal Council area, most of the people are found to be unaware of the "3Rs". By conducting proper solid waste management practices among the people the excess amount of garbage disposed to the municipal council can be reduced. This research emphasises the importance of people maintaining good solid waste management practices. The research found that 75% of the people are not satisfied with the services provided by the MMC and they are willing to pay for the better solid waste management services. So the government should provide some facilities for the betterment of the MMC and improve the solid waste management system; e.g. introducing recycling procedures for man-made waste. The Municipality has to be provided with adequate education and develop an awareness of how to handle solid wastes at homes and about the consequences of disposing solid wastes everywhere illegally and not placing of solid wastes properly in the disposal sites.

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Impact of Bank Size on Bank Profitability: Using Four Licensed Commercial Banks in Sri Lanka

W. M. T. Jayamali and S. J. S. De Mel

Department of Economics & Statistics, University of Peradeniya, Sri Lanka

Keywords: *Bank; Profitability; Financial System; Sri Lanka*

Introduction

The banking sector, in all countries, has an important effect on economic measures due to the essential role played by banks for improvements in overall economic activity necessary for economic growth (Monnin and Jokipii 2010). Today, the sector is moving towards integrated financial services. One of the main goals of a bank is to make profits. Only a profitable banking sector can contribute to the stability of the financial system. As such, an understanding of factors that affect bank profitability is very important for banks themselves. In the existing literature, bank size has been considered as a fundamental variable in explaining bank profitability by various researchers. Size of a business means the ability it possesses and the variety and production capacity or the quantity and multiplicity of services the business can be offer to its customers.

Previous studies examining this relationship have yielded mixed results. Correlation analysis of Velnampy and Nimalathasan (2010) showed a positive relationship between bank size and profitability in Commercial Bank of Ceylon Ltd, but there is no relationship between bank size and profitability in Bank of Ceylon. Aladwan (2015), Ani et al. (2012) and Sufian and Habibullah (2009) have found a negative relationship. Therefore, it is very essential to address the following research question which is "What is the impact of bank size on bank profitability in Sri Lanka?" Given this background, the present study investigates the impact of bank size on bank profitability in Sri Lanka, using four LCBs namely Bank of Ceylon, Peoples Bank, Sampath Bank and Hatton National Bank over the period 1998 to 2017.

Objectives

Main objectives of this study are to: identify the impact of bank size on its profitability in Sri Lanka for the selected LCBs; identify alternative measures of bank size and bank profitability as well as alternative model specifications; identify the impact of bank size on bank profitability separately for the four banks.

Methodology

The study employed secondary data drawn from Annual Reports of four Licensed Commercial Banks over the period 1998 to 2017. Variables were tested by developing six models. Panel regression and OLS method were employed to obtain the results. The following regression models were developed based on the variables in the study. The empirical models used in this study for panel data is given as,

Model I : $ROA_{it} = \beta_0 + \beta_1 Size\_TA_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 CA_{it} + \varepsilon_{it}$

Model II : $ROA_{it} = \beta_0 + \beta_1 Size\_NOE_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 CA_{it} + \varepsilon_{it}$

Model III : $ROA_{it} = \beta_0 + \beta_1 Size\_NOB_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 CA_{it} + \varepsilon_{it}$

Model IV : $ROE_{it} = \beta_0 + \beta_1 Size\_TA_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 CA_{it} + \varepsilon_{it}$

Model V : $ROE_{it} = \beta_0 + \beta_1 Size\_NOE_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 CA_{it} + \varepsilon_{it}$

Model VI : $ROE_{it} = \beta_0 + \beta_1 Size\_NOB_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 CA_{it} + \varepsilon_{it}$

$i = 1, 2, 3, 4; \quad t = 1998 - 2017$

1= Bank of Ceylon; 2= People's Bank; 3= Sampath Bank; 4= Hatton National Bank

Where, ROA is Return on Assets; ROE is Return on Equity; Size_TA is Total Assets, Size_NOE is Number of Employees; Size_NOB is Number of Branches; LEV is Leverage; LIQ is Liquidity; and CA is Capital Adequacy.

The following three models were used separately for each bank.

Model I : $ROA_{it} = \beta_0 + \beta_1 Size\_TA_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 CA_{it} + \varepsilon_{it}$

Model II : $ROA_{it} = \beta_0 + \beta_1 Size\_NOE_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 CA_{it} + \varepsilon_{it}$

Model III : $ROA_{it} = \beta_0 + \beta_1 Size\_NOB_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 CA_{it} + \varepsilon_{it}$

Results and Discussion

The given six models were analyzed using Random Effects, Fixed Effects, Generalized Least Squares method and Generalized Method of Moments. Hausman test was used to select the best model from random effect and fixed effect model. According to Hausman test results random effect was the best model. From Random Effects, Generalized Least Squares method and Generalized Method of Moments same coefficient values were obtained for the variables in each model but the probability values were different. Panel data contained the problem of heteroscedasticity. Therefore, GLS was used as a solution to these problems. Therefore, the results were interpreted using Generalized Least Squares method.

ModelI: $\widehat{\mathrm{ROA}}_{it} = 13.66 + 7.45e^{-10}\mathrm{Size\_TA}_{it} - 0.135\mathrm{LEV}_{it} + 0.005\mathrm{LIQ}_{it} - 0.0018\mathrm{CA}_{it}$

When model I is analyzed, independent variables Size_TA, LEV, LIQ and CA are observed to influence bank profitability (ROA). The overall model was significant at 1%. Out of the four variables only two variables were significant at 1%. According to panel data analysis, total assets and number of branches positively affect Return on Assets.

Model II: $\widehat{\mathrm{ROA}}_{\mathrm{it}} = 12.302 + 0.00003\mathrm{Size\_NOE}_{\mathrm{it}} - 0.122\mathrm{LEV}_{\mathrm{it}} + 0.002\mathrm{LIQ}_{\mathrm{it}} + 0.026\mathrm{CA}_{\mathrm{it}}$

According to the data analysis when Model II is analyzed, independent variables Size_NOE, LEV, LIQ and CA influence bank profitability (ROA). The size variable in terms of number of employees shows no significant relationhip with bank.

Model III: $\widehat{\mathrm{ROA}}_{\mathrm{it}} = 16.878 + 0.001\mathrm{Size\_NOB}_{\mathrm{it}} - 0.170\mathrm{LEV}_{\mathrm{it}} + 0.001\mathrm{LIQ}_{\mathrm{it}} - 0.006\mathrm{CA}_{\mathrm{it}}$

According to the data analysis when Model III is analyzed, independent variables Size_NOB, LEV, LIQ and CA are identified as having an influence on bank profitability (ROA). There is a positive relation between the number of branches which is a bank size indicator and ROA. In other words, profitability of bank increases as number of branches increases.

Model IV: $\widehat{\mathrm{ROE}}_{it} = -3118.79 - 4.94e^{-08}\mathrm{Size\_TA}_{it} + 32.149\mathrm{LEV}_{it} + 3.095\mathrm{LIQ}_{it} + 10.504\mathrm{CA}_{it}$

When Model IV is analyzed, independent variables Size_TA, LEV, LIQ and CA are seen to have an impact on bank profitability (ROE). The overall model

was significant at 10%. According to this model the bank size indicator which is total assets shows no significant impact on bank profitability (in terms of Return on Equity).

Model V: $\widehat{\mathrm{ROE}}_{it} = -2858.49 + 0.00047 Size\_NOE_{it} + 29.319\mathrm{LEV}_{it} + 3.458\mathrm{LIQ}_{it} + 8.588\mathrm{CA}_{it}$

When Model V is analyzed, independent variables Size_NOE, LEV, LIQ and CA are identified as having an influence on bank profitability (ROE). In this model, too, size measures show no significant relation to bank profitability.

Model VI: $\widehat{\mathrm{ROE}}_{it} = -3447.29 - 0.148\mathrm{Size\_NOB}_{it} + 35.716\mathrm{LEV}_{it} + 3.267 LIQ_{it} + 11.350 CA_{it}$

Analyzing Model VI, independent variables Size_NOB, LEV, LIQ and CA have an impact on bank profitability (ROE). Size measures show no significant relation to bank profitability in terms of Return on Equity.

Taking banks separately, only Bank of Ceylon and Hatton National Bank show a relationship between bank size variables and profitability measures. In BOC, total assets have a positive impact on bank profitability. Number of employees and capital adequacy has a negative significant impact on bank profitability. In HNB, Number of branches has a positive significant impact and capital adequacy and liquidity have a negative impact on bank profitability. People's Bank and Sampath Bank do not show any impact.

Conclusion

As per panel data analysis, total assets impact positively on Return on Assets, so banks can increase total assets to increase Return on Assets. Since there is no relationship between bank size and bank profitability in Sampath Bank and People's Bank, they can pay more attention to other profitability indicators. Since HNB and BOC show a relationship between bank size and profitability, they should pay more attention to size variables and can have a greater possibility of taking advantage of economies of scale. It could be fruitful to integrate the other internal factors as well as the external factors which affect bank profitability instead of taking only the bank size. Some of these issues will be addressed in future empirical studies.

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Measuring the Impact of Special or Concessionary Tax Rate Policies on Corporate Income Tax Revenue of Sri Lanka

K. K. S. Hettiarachchi[1] and J. M. A. Jayawickrama[2]

[1] *PGIHS, University of Peradeniya, Sri Lanka*

[2] *Department of Economics & Statistics, University of Peradeniya, Sri Lanka*

Keywords: *Concessionary Tax; Income Tax; Policies; Sri Lanka.*

Introduction

The corporate income tax (CIT) is the main direct tax of Sri Lanka. In recent years, it accounted for 9.2 % of total tax revenue and 52 % of income tax revenue of Sri Lanka. One important issue in CIT in the case of Sri Lanka is its gradual decline reported over time as a percentage of GDP. In the early 1980s and early 1990s, the ratio approached 2.5 % and later recorded a gradual decline to about 1% in recent years. At a given marginal corporate income tax rate, it is expected that CIT revenue will increase in line with the expansion of the GDP. But, the declining trend of CIT revenue as a ratio of GDP indicates that CIT revenue does move in line with the growth of the economy. Jayawickrama (2008) and Madushani and Jayawickarama (2014) show that the income elasticity of the CIT is relatively low in Sri Lanka which indicates the failure of the tax to track GDP closely.

The government of Sri Lanka has granted concessionary /special CIT rates according to the company size and sector to achieve objectives such as the promotion of local and foreign investment, protection of the companies at their early stage to compete the market competition, promotion of agricultural production, promotion of small and medium scale companies and elimination of regional development disparities etc etc. (Wijesinghe, Ekanayake and Mahendra (2013)

Special tax rates or concessionary tax rates granted for different sectors or companies by Sri Lankan governments may be expected to reduce the tax revenue collected in the short run and to expand the sector at a higher growth

rate in the long run. Many resechers argue that the declining tax/GDP ratio is mainly due to tax exemptions, concessionary tax rate policies etc. (Jayawickrama, 2008; Amirthalingam, 2013; Hettiarachchi and Jayawickrma, 2018). However, no studies have computed revenue loss due to exemptions or concessionary tax rate policies granted by the government for different sectors with a view to enhance the growth of the economic activity or the sector.

Objective

The objective of this study is to examine the effect of special and concessionary CIT rate policies granted by the government to different corporate sectors on the loss of tax revenue during the period 2010 to 2017 in Sri Lanka.

Methodology

Theoretically, CIT revenue is computed based on the marginal CIT rate and taxable corporate income. This is known as the potential CIT revenue (Davoodi and Grigorain, 2007). In practice, CIT revenue is computed based on the concessionary tax rates granted for selected sectors and the sector-wise taxable corporate income. This is known as the actual CIT revenue collected. Then, the difference between the potential revenue and the actual revenue collected is explained as the CIT revenue loss due to special and concessionary tax rate policies.

In this study, potential CIT revenue (PCITR) and actual CIT revenue collected (ACITR) are used to compute the loss of CIT revenue (LCITR) due to tax rate policies. In order to measure the decrease in tax revenue collection, the sectors which were granted special tax rates and concessionary tax rates are treated separately. Thus PCITR is defined as follows:

$$PCITR = \tau \sum_{i=1}^{n} TI_i \qquad (1)$$

where, τ is the marginal corporate income tax rate and $\sum_{i=1}^{n} TI_i$ is the aggregate taxable income (TI) of *n* number of companies in a given year. The actual CIT

tax revenue collected by the Inland Revenue Department of Sri Lanka is defined as follows:

$$ACITR = \sum_{i=1}^{n} ACITR_i^s + \sum_{j=1}^{m} ACITR_j^c \qquad (2)$$

Where, $\sum ACITR_i^s$ is the actual CIT revenue collected under special tax rates offered for different sectors/companies and $\sum ACITR_j^c$ is the actual CIT revenue collected under concessionary tax rates offered for different sectors/companies. The loss of CIT revenue (LCITR) due to special and concessionary tax rate policies is defined as the difference between PCITR and ACITR. For the computation, we use information for seven assessment years from 2010/2011 to 2016/2017. In each assessment year, we have a sample 20 % (1015 Companies) out of a population of 5075 companies recording the availability of continuous tax returns for the period. The sample is selected to reflect the different scale of companies - small, medium and large - based on tax computational definitions of the Inland Revenue Department. The sample consists of 656 small companies, 252 medium companies and 107 large companies. The marginal CIT rate used for the computation of potential revenue is 35 % for the assessment year 2010/11 and 28 % for the rest of the period.

Results and Discussion

The potential CIT revenue in respect of the sample of 1,015 ccompanies was estimated as Rs. 19,404 million in the 2010/11 assessment year and Rs. 45,866 million in the 2016/17 assessment year. Further, it shows a gradual increase over the years though the marginal tax rate was lowered to 28 % in the 2011/12 assessment year and onwards compared with 35 % which prevailed in the 2010/11 assessment year. The average potential CIT revenue stood as Rs.30,462 million during the period.

The Actual CIT revenue collected by the Department of Inland Revenue was Rs.10,035 million in 2010/11 and it gradually increased thereafter and reached Rs.16,293 million in the 2016/17 assessment year. The average of the actual

CIT revenue collected stood as Rs. 13,040 million during the sample period. The estimated CIT revenue loss due to special and concessionary tax rate policies of Sri Lankan Governments is given in Table 1 below.

Table 1: CIT revenue loss due to special and concessionary tax (Rs. Mn)

Year	Potential CIT Revenue	Actual CIT Revenue	CIT Revenue Loss
2010/11	19,404	10,035	9,369
2011/12	17,618	10,888	6,730
2012/13	19,497	12,639	6,858
2013/14	34,788	13,165	21,623
2014/15	35,874	14,013	21,861
2015/16	40,187	14,245	25,942
2016/17	45,866	16,293	29,573

The CIT revenue loss due to special and concessionary tax rate policies of the government has increased from Rs. 9,369 million in the 2010/11 assessment year to Rs. 29,573 million in the 2016/17 assessment year. There is around a two-fold increase in potential CIT revenue in the 2013/14 assessment year compared to that of the previous yea, and a three-fold increase in CIT revenue loss in 2016/17 assessment year compared to that of the previous year.

Following the same method, the compution of CIT revenue loss for the companies at different scale of operation shows that the CIT revenue loss due to special and concessionary tax rates granted for small scale companies stood as Rs. 420 million in 2010/11 and it increased rapidly to Rs. 847 million in 2016/17. Due to tax rate concessions granted for medium companies, the government had a loss of CIT revenue of about Rs. 842 million in 2010/11 and Rs. 803 million in 2016/17 and decreased at a much slower rate. In large companies, tax rate concessions led to a CIT revenue loss of Rs.8,106 million in 2010/11 and Rs.27,923 million in 2016/17. The average loss per company due to special and concessionary tax rate policies stood as follows in 2010/11 and 2016/17 assessment years: small companies – Rs. 0.6 million and Rs. 1.3 million; medium companies- Rs. 3.3 million and Rs. 3.2 million; and large

companies –Rs. 76 million and Rs. 261 million respecively. It seems that special tax rates or concessionary tax rates granted for small and large companies created a substantial CIT revenue loss in recent years. Further, the rapid increase in per company CIT revenue loss indicates that the expected positive impact on tax revenue is not evident over time.

Conclusion

This study computed the loss of CIT revenue due to special and concessionary tax rate policies of the government implemented under various policy objectives. It was found that about Rs. 29,573 million of CIT revenue loss was occurred in the 2016/17 assessment year. And it is about Rs. 16,293 million higher than the actual CIT revenue collected in the year. Further, CIT revenue loss due to special and concessionary tax rate policies has increased rapidly from 2010 to 2017. Moreover, per company CIT revenue loss due to special and concessionary tax rates granted for large, medium and small companies Rs. 261 million, Rs. 3.2 million and Rs. 1.3 million, respectively, in 2016/17. The Average loss of CIT revenue stood as 57% of the potential CIT revenue of the companies. This indicates that an average Rs.17 million tax loss is reported per company. If the projection is made to the population of 5075 companies, the average tax loss would be about Rs. 86,275 million.

Estimated values of CIT revenue loss indicate that the cost of special and concessionary tax rate policies is large and increasing over time. Further, the increasing CIT revenue loss reflects that the negative effect of granting of special tax rates and concessionary tax rates on CIT revenue is continuing at increasing rates. It further indicates that the expected positive effect of the policy through expansionary tax bases is not evident over time. The policy on special and concessionary corporate income tax rates applied for different sectors has eroded the actual corporate income tax revenue of the government. Therefore, it is highly essential that the government make a proper assessment on whether these special or concessionary rates granted for selected companies and sectors met their objectives and whether the continuation of such concessions are still important.

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Corporate Social Responsibility and Financial Performance in Tourism Industry

D.R.M. Weerasinghe, G.P.T.D. Pathirana, C.M. Rajapaksha, R.A.K.R. Perera, S. Kaneshwaren, N. Nagendrakumar and L.M.H. De Silva

SLIIT Business School, Sri Lankan Institute of Information Technology Sri Lanka

Keywords: *Corporate Social Responsibility; Financial Performance; Tourism Industry; Sri Lanka*

Introduction

Corporate Social Responsibility (CSR) is no longer considered a composition of voluntary activities in today's business world since it plays a significant role in developing a sustainable future for firms operating in an industry such as tourism. Today, tourism is the third-largest source of foreign exchange earnings in Sri Lanka and has shown an upsurge in growth after the end of the civil war in 2009. Tourist arrivals have grown from 447,890 in 2009 to 2,333,796 in 2018 and the Sri Lanka Tourism Development Authority is planning to double these numbers by 2020. The domain of CSR has been studied in several industries, but not in relation to the tourism industry, especially concerning the behavior of Financial Performance (FP) to CSR disclosure in Sri Lanka. Hence, the present study focused on how CSR and FP have behaved over the past five years in the tourism industry and it investigated the relationship between tourist arrivals and FP in the selected sector.

Objectives

The purpose of this study is to fill the knowledge gap through empirical analysis, exploring the relationship between CSR and FP in the tourism industry in Sri Lanka. The study provides insights into the trend of CSR disclosure and FP in the tourism industry over the past five years.

Methodology

A sample of 10 listed hotel firms were selected based on systematic sampling method. The data were gathered through a desktop method using five annual reports for the period 2014-2018. Initially, a content analysis was carried out to identify CSR related

information. Accordingly, preliminary work was exercised to develop a checklist of CSR related keywords based on the literature (Hackston and Milne, 1996; Inoue and Lee, 2011; Maqbool and Zameer, 2018). The checklist contained 190 keywords relating to five CSR dimensions *viz.* community, employee relations, environment, product quality and diversity. Later the theoretical thematic analysis by Braun and Clarke (2006) was adopted to deepen the analysis. Under thematic analysis, CSR related information disclosed were categorized into 62 CSR sub-themes. These sub-themes were derived from the previously developed CSR checklist.

A set of decision rules were also developed to maintain consistency in analyzing annual reports (Hackston and Milne, 1996). Repetition of these keywords and sub-themes were then converted into Nila units (Nuzula and Kato, 2010) to measure CSR performance of each firm. Average Annual Nila Unit Percentage (ANUP) of each year was then calculated to identify the trend of CSR disclosure during the considered period. The financial aspect of firms was evaluated using Return on Equity (ROE) ratios. Average Return on Equity (AROE) of each year was then derived to identify how FP of the selected industry has behaved during the selected period.

Results and Discussion

Average annual growth rate of ANUP is 5.54 %. Furthermore, annual growth rates of ANUP have varied between 13.77 % to 1.35 %, depicting an inconsistency in growth during the considered period. Hence, study reveals a positive but slight incremental trend of CSR disclosure. However, overall growth of ANUP from 2014 to 2018 is 24.05 %. Though, this figure may look attractive at first glance, the annual average growth rate is only 5.54 %. This illustrates slow growth in the overall level of CSR disclosure in the period between 2014-2018 (Table 1).When it comes to dimensions of CSR, it is observed that most of the information disclosed relates to “employee relation” and “community” with an average weight of disclosure of 37 % and 23 % respectively during the considered period. “Environment” and “Product quality” are given weights of 19 % and 16 %, respectively, with diversity being at only 6 % (Table 2).

Table 1: Trend in CSR Disclosure and FP

	C	ER	EN	PQ	D
Avg. Weight of Disclosure	23 %	37 %	19 %	16 %	6 %

Table 2: Average Importance during the Period

	Annual Growth of CSR and ROE (%)				AAGR	2014-2018
Financial Year	14/15	15/16	16/17	17/18		(%)
ANUP (CSR)	13.77	4.18	1.35	3.27	5.54	24.05
AROE (FP)	-11.17	-14.52	-6.06	-11.46	-10.86	-36.85

Table 3: Correlation between CSR and FP

		Mean_ROE	Mean_CSR
Mean_ROE	Pearson Correlation	1	-.959**
	Sig. (2-tailed)		.010
	N	5	5
Mean_CSR	Pearson Correlation	-.959**	1
	Sig. (2-tailed)	.010	
	N	5	5

The study also found that there is a decreasing trend in AROE during the five years examined. Between 2014 and 2018, AROE has shown a decline of minus (-) 36.85 % with an annual average decline rate of -10.86 % (Table 1). Therefore, a significant decrease in AROE during the period is evident. Based on Pearson correlation, it was established that a negative but strong correlation of -0.959 exists between CSR and FP with a P-value of 0.010. Data set includes five cases, which represents data relating to the ten hotel firms for the five years considered. For the present study, the significance level is required to be less than 0.05 for the relationship to be significant. Hence, based on the findings of the present study, a statistically significant, negative relationship between CSR and FP is evident in the tourism industry of Sri Lanka.

Conclusion

Findings of the study reveal a slight but incremental trend in CSR disclosure of the tourism industry. However, the growth of the CSR disclosure trend in the past few years is not consistent. Furthermore, the highest proportion of information disclosed in annual reports relates to dimensions such as

employee relations, community and environment. Moreover, it is evident that, though tourist arrivals have continued to increase over the years, AROE of the industry has shown a significant drop. Furthermore, the study concludes that there is a strong negative relationship between CSR and FP in the tourism industry of Sri Lanka. This problematic situation prevailing in the industry requires proper attention from the governing bodies of the country. This study becomes very vital for the policymakers to design countermeasures to protect the industry and its negativity highlights the need for further research whether the going concern of the companies in the tourism industry is in danger. The study also raises the question of whether the tourism industry is ignorant of CSR activities. As a result, it provides a further opportunity for future research in this domain.

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Financial Intermediation and Economic Growth: Evidence from Sri Lanka

S. Mathusha and K. Gnaneswaran

Department of Economics & Statistics, University of Peradeniya, Sri Lanka

***Keywords**: Financial Intermediation; Economic growth; Bound Testing; Cointegration*

Introduction

The importance of commercial banks in generating growth within an economy has been widely discussed by various scholars. Commercial banks are mainly involved in financial intermediation, which is the channeling of funds from surplus unit to deficit units of the economy, thus transforming bank deposits into loans or credits. The role of credit on economic growth has been recognized as credits that are obtained by various economic agents to enable them meet operating expenses. Business firms obtain credit to purchase seeds, fertilizers, erect various kinds of farm buildings. Therefore, the credit funds are made available for investment in productive capital (Chinwoke et al. 2014).

Soon after financial liberalization in Sri Lanka in 1977, the government introduced financial sector development policies. This created a competitive environment in the financial sector. In this context, a dramatic change can be seen within the commercial banking system. The number of commercial banks have increased while financial intermediation of commercial banks shows an upward trend. However, the growth performance of Sri Lanka during the post liberalization period is higher than the pre liberalization period. Although the country was able to maintain an average five percent growth rate, it was not consistent throughout the period. The data related to economic growth reveals high fluctuation. The existing literature identifies a positive relationship between financial intermediation and economic growth (Rexiang and Rathnasiri, 2008; Donald et al., 2000; Chinwoke et al., 2014). However, the quantitative assessment of the relationship between financial intermediation and economic growth is inadequate and limited in the context of Sri Lanka.

Thus, this study attempts to fill this gap by investigating financial intermediation and economic growth in Sri Lanka.

Objective

The main objective of the study is to investigate the relationship between financial intermediation and economic growth in the long run and the short run for Sri Lanka.

Methodology

The study covers over the period 1977 – 2015. Data on Real Gross Domestic Product (RGDP), commercial bank credit to private sector (BPC), exchange rate (ER) and foreign direct investment (FDINI) were extracted from the annual reports of the Central Bank of Sri Lanka. Real interest rate (RIR) and consumer price index (CPI) data were collected from the World Development Indicator (WDI) data base. Except RIR all the variables were transformed into their natural logarithm. ADF and PP unit root tests methods were employed to test the stationarity of the series. Akaike Information Criterion (AIC) was applied to determine the optimal lag length of each series. RGDP is used as a proxy for economic growth and BPC is the proxy for financial intermediation. The long run relationship between the variables is developed as below:

$$\ln RGDP_t = \alpha_0 + \alpha_1 \ln BPC_t + \alpha_2 \ln CPI_t + \alpha_3 \ln ER_t + \alpha_4 \ln FDINI_t + \alpha_5 RIR_t + \varepsilon_t \quad (1)$$

where, ε_t is a white noise error term, $t = 1, 2, \ldots\ldots, T$

If the variables in equation (1) have different order, which is I (1) and I (0) we can use the new co-integration method which was developed by Pesaran et al., (2001). This procedure, i.e. Autoregressive Distributed Lag (ARDL) Bound test approach is used to test co-integration among variables. The equation ARDL was further transformed in order to accommodate the error correction term with one period lagged (ECT_{t-1}). Finally, the Wald test was used to determine the direction of causality between the variables.

Results and Discussion

The results of ADF and PP unit root tests indicate that the variables are integrated in order zero (CPI, RIR, ER) and order one (RGDP, BPC, FDINI). AIC advocated the use of ARDL (1, 3, 4, 4, 4, 4) model for this analysis. The long run results are presented in Table 1. BPC has a positive and statistically significant relationship with RGDP in the long run. Particularly, if the BPC increases by 1% RGDP will increase by 0.83%. It clearly shows that BPC has been favourable for RGDP in the long run. FDINI affects RGDP positively in the long run but it is not statistically significant. At the same time, CPI, ER and RIR have (at 5% level of significance) a negative impact on RGDP in the long run.

Table 1: The results of ARDL (1, 3, 4, 4, 4, 4) Model

Panel A: The results of long run coefficients (DV: LRGDP0)

Con	LBPC	LCPI	LER	LFDINI	RIR	R^2
0.66	0.8337	-0.748	-0.437	0.025	-0.017	0.99
	(0.0283)	(0.0339)	(0.0005)	(0.1406)	(0.0005)	

Panel B: The Results of the Diagnostic Test	
Serial correlation [LM Test:$X^2_{(df)}$]	Prob.= 0.1007
Normality Test (Jarque -Bera)	Prob.= 0.3839
Heteroscedasticity (BPG Test)	Prob.= 0.7145
Omitted Variable Test	Prob.= 0.0660

Note: Probability values are given in the parenthesis *, ** represents the variables are statistically significant at 10% and 5% level of significance respectively.

The Lagrange Multiplier (LM) test of autocorrelation indicates that the residuals are not serially correlated. According to the Jarque – Bera (JB) test, the null hypothesis of normally distributed residuals cannot be rejected. The Breush-Pagan-Godfrey (BPG) test of heteroscedasticity suggests that the disturbance term in the equation is homoscedastic. The Ramsey RESET test result confirms that there is no specification error in the estimated model (See Table 1 Panel B above). The CUSUM plots lie between the lower and upper critical bounds at the 5% significance level, which confirms the stability of the parameters. The results of Bound test confirms that there is a long run relationship between RGDP and other variables since the null hypothesis of

no cointegration among the variables is rejected due to the computed F statistic (7.35) being greater than the upper bound critical value (3.79) at 5% level of significance.

Table 2: Error correction representation of ARDL Model

	Lag order				
Variables	0	1	2	3	4
ΔLRGDP		0.436*			
		(0.0686)			
ΔLBPC	0.123**	-0.035	0.121**	-0.044	
	(0.0177)	(0.5088)	(0.0057)	(0.1717)	
ΔLCPI	-0.179**	0.299**	0.214**	-0.114*	0.146**
	(0.0129)	(0.0208)	(0.0174)	(0.0624)	(0.0186)
ΔLER	-0.052	0.063	-0.160**	-0.046	-0.124**
	(0.3965)	(0.1820)	(0.0070)	(0.0.4141)	(0.0062)
ΔLFDINI	-0.0096	-0.0096	-0.016**	-0.003	-0.020**
	(0.1123)	(0.1550)	(0.0164)	(0.4542)	(0.0012)
ΔRIR	-0.007**	-0.0004	-0.004**	-0.001	-0.004**
	(0.0021)	(0.6821)	(0.0057)	(0.1500)	(0.0054)
ECT (-1)	-0.8610 (0.0254)				
R^2	0.9671	F-Stat= 7.9108 (0.0044)			
Panel B: The Result of the Diagnostics Test					
Serial Correlation [LM Test: $x^2_{(df)}$]				Prob.=0.4038	
Normality Test (Jarque – Bera)				Prob.=0.5829	
Heteroscedasticity (BPG Test)				Prob.=0.2816	
Omitted Variable (Ramsey's RESET)				Prob.=0.6417	

Note: Probability values are given in the parenthesis *, ** indicates that variables are statistically significant at 10% and 5% level of significance respectively.

The result of short run dynamic and long run adjustment coefficients are estimated using Equation (3) which is presented in Table 2. The ECM model passed all the diagnostics tests. Panel A of Table 2 reports the short run dynamic coefficients estimates of ARDL-ECM. Accordingly, as expected, the current value of BPC and the two period lagged value of BPC have a positive impact on RGDP, whereas current period CPI, FDINI and RIR have a negative significant impact on RGDP. Further, ECT (-1) carries an expected negative sign, which is highly significant indicating that there should be an adjustment toward steady state line in the long run one period after an exogenous shock. Thus, about 86.1% of the disequilibrium in the RGDP is offset by short-run

adjustment in each period. Finally, the Wald test detected only unidirectional causality between BPC and RGDP in the short run.

Conclusion

The objective of this study was to investigate the long run and short run relationship between financial intermediation and economic growth in Sri Lanka using time series data for the period 1977 to 2015. As per the findings of the study, we conclude that both cointegration approach to ARDL and error correction version of ARDL passed all the diagnostics and the stability tests. The Bound test confirms that the variables are cointegrated. The BPC affects the RGDP positively and significantly in the long run. CPI, ER and RIR have negative and significant impact on RGDP in the long run. Moreover, the current value of BPC and one period lagged value of BPC positively and significantly affect the RGDP in short run. Further, this model confirms that real gross domestic product can get back to long run steady state line at the speed of 86.1% in each period after an exogenous shock. In terms of policy implications, the findings suggest that the financial sector of Sri Lanka should take necessary actions to improve the intermediation process.

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Export Led Growth Hypothesis in the Context of Sri Lanka

K. Werawella

Department of Economics, University of Colombo, Sri Lanka

***Keywords**: Cointegration; ECM; Exports; Gross Domestic Production*

Introduction

As many schools of thoughts emphasize, economic growth is a complex process which depends on many socio-economic and political factors. Economists have attempted to identify the major determinants of economic growth through various means, and theories emphasizing capital accumulation, consumption level, trade, economic stability and political environment. In this study, the author gives prime attention to the export led-growth hypothesis which simply states that expansion of exports is a significant determinant of the economic growth of a country. Further, the export led growth hypothesis emphasizes exports as the engine of economic growth along with labor and capital. Even though few studies have been conducted regarding the particular area by adopting various methodologies and taking Sri Lankan experience into account, results of most of those studies show an insignificant relationship between exports and economic growth. On the other hand, one of the major suggestions of the Vision 2025 policy framework is that of developing Sri Lanka as an export-oriented economy. In this context, there is an apparent mismatch between empirical results and the policy framework of the country. Therefore, conducting a comprehensive analysis is called for. Hence, this study attempts to examine the validity of the export led growth hypothesis (ELGH) for Sri Lanka.

Objective

The general objective of this study is to investigate the relationship between exports and economic growth in Sri Lanka and to identify the impact of exports on economic growth based on time series annual data from 1978 to 2018.

Methodology

This study is developed based on the extended version of the neoclassical Solow Swan Growth Model (1956) which emphasizes capital and labour as the major determinants of economic growth. Gross Domestic Production (GDP) is considered as the dependent variable while Gross Domestic Capital Formation (GDCF), employment and exports are considered as independent variables. Standard time series methods are employed to identify the validity of the ELGH. The time series annual data for the study period is obtained from World Development Indicators (WDI) of the World Bank. The series are transformed into natural logarithm terms to avoid the issues of heteroscedasticity. This study has added exports as a new variable to the traditional Neo Classical Growth Model. Based on the previous studies of Feder (1982), Balassa (1985), Smith (2001), the following empirical model is adopted for the study:

$$LnGDP_t = \beta_0 + \beta_1 LnGDCF_t + \beta_2 LnEMP_t + \beta_3 LnEX_t + \varepsilon_t$$

lnGDP represents the Natural Logarithm of Gross Domestic Production. LnGDCF, LnEMP and LnEX represent the Natural Logarithms of Gross Domestic Capital Formation, Employment and Exports, respectively. Further, ε and t represent error term and time component respectively. First, trend analysis was conducted based on available literature, and Augmented Dickey Fuller (ADF) test was carried out to identify the stationarity of the data. The Engel Granger cointegration test was used to test the the long run relationship between exports and GDP. In addition, error correction model (ECM) test was adopted to examine the short run relationship. All tests mentioned above were conducted using E-Views 9 statistical software package.

Results and Discussion

According to the results of the ADF test I conclude that all the variable have unit root at level while stationary at first difference, I (1). Because all the variable are integrated of the same order, integrated of order one, Engel Granger Cointegration test can be conducted. The Results of Engel Granger test and OLS test are shown in Table 1.

Table 1: 1st Step of the Engel Granger Cointegration test – OLS regression

Variable	Coefficient	Standard Error	t-statistics
Constant	5.278	1.520	3.471***
LnGDCF	0.547	0.034	15.967***
LnEMP	0.069	0.210	0.328
LnEX	0.272	0.064	4.231***
Effects Specifications			
R-squared	0.995	F-statistic	2059.970
Adj. R-squared	0.995	Prob(F-statistic)	0.000
Durbin-Watson	1.712		

Note: *, ** and *** represent statistical significance at 10%, 5% and 1% respectively

As shown in Table 1, exports and GDCF have significant relationships with the GDP under the 1 percent significance level. Table 1 also indicates that a 1 percent increase in exports lead to a 27 percent increase in GDP. But the relationship between employment and GDP is insignificant. Further, by the R-squared value, 99 percent of the variation in the dependent variable is explained by independent variables. Because of the possibility of spurious results, ADF test is conducted on generated residuals of the OLS test and the results of the test is presented in Table 2. As results indicate, absolute value of test statistic of the ADF test is greater than the absolute value of Engel Granger critical value under 5 percent significant level which means residuals are stationary at level. This indicates the existence of long run equilibrium between the dependent and independent variables. Further, the results show that not only exports, but also GDCF has a significant positive impact on GDP in the long run, except employment which is insignificant.

Results of the ECM are reported in Table 3 and the significant negative coefficient of the error correction term reveals confirmation of long run relationship in the model. The coefficient of the error correction term is (minus) -0.272105 and it shows that approximately 27 percent of a disturbance is adjusted over the long run. It means that the model corrects the disequilibrium of the short run by a speed of 27 percent. In addition, results do not support rejecting the null hypothesis of no relationship which means there is no relationship between exports and GDP in the short run.

Table 2: ADF Unit Root test on U (Residuals)

	t-statistic	Prob.
ADF Test Statistic	-5.323***	0.0000
Engle-Granger Critical Value	1%	-5.017
	5%	-4.324
	10%	-3.979

Note: *, ** and *** represent statistical significance at 10%, 5% and 1% respectively.

Table 3: Error Correction Model

Variable	Coefficient	Standard error	t-statistics
C	0.031	0.003	10.086***
D(LGDCF)	0.235	0.033	6.954***
D(LEMP)	0.035	0.067	0.530
D(LEX)	0.059	0.037	1.582
U(-1)	- 0.272	0.087	-3.099***
Effects Specifications			
R-squared	0.761	F-statistic	18.403
Adj. R-squared	0.720	Prob(F-statistic)	0.000
LM test	0.093	Durbin-Watson stat	1.582

Note: *, ** and *** represent statistical significance at 10%, 5% and 1% respectively.

On the other hand, GDCF is the only independent variable which has significant effect on the dependent variable in the short run which indicates that a 1 percent increase leads to approximately 0.24 percent increase in GDP. It can be concluded that, even though the results of the ECM model confirms the long run equilibrium of the dependent and independent variables which strengths the validity of ELGH in the context of Sri Lanka, it does not provide sufficient support for a short relationship between exports and GDP.

Serial correlation is one of the prominent issues with ECM which makes the model inappropriate. Therefore the Breusch-Godfrey Serial Correlation LM Test was conducted and results indicate that the null hypothesis of no serial correlation cannot be rejected under the 5 percent significance level which reinforces the validity of results of the ECM further. As indicated by the above results, there is a relationship between the exports and GDP in the long run and but not in the short run. It clearly means that, the results of the long run

model strongly support the validity of the ELGH in the context of Sri Lanka. Further, there are many channels through which exports can impact on economic growth as revealed by the literature. They include generation of greater capacity utilization, advantage of economies of scale, ability to absorb foreign technology, employment creation, increases in labor productivity, improving the allocation of scarce resources throughout the economy, relaxing the current account pressures for foreign capital goods by increasing the country's external earnings, attracting foreign investment and increasing the TFP and hence the well-being of the country (Smith, 2001). As for other variables, only GDCF has a significant impact on GDP in both long and short run in Sri Lanka. As the neo-classical Solow-Swan growth model emphasizes, capital accumulation is a core determinant of economic growth in both short and long run. Further, capital accumulation leads to improved productivity of the economy and higher economic growth.

Conclusion

Many studies emphasize exports as a major factor which stimulates the economic growth of a country and this study attempts to examine the validity of this statement using time series econometric analysis for Sri Lanka. Results of the ADF test revealed that all the variables considered in the study are nonstationary in level and in first difference. The results of the Engel Granger Cointegration test concluded that GDCF and exports have significant impact on GDP in the long run. A 1 percent increase in exports lead to a 27 percent increase GDP. Further, the ECM test results confirmed the long run relationship and showed that the model corrects the disequilibrium of the short run at a speed of 27 percent. In addition, ECM indicated that GDCF is the only variable which has a significant relationship with economic growth in the short run. Finally, the study provides statistical support to the validity of the Export Led Growth Hypothesis (ELGH) in the context of Sri Lanka only in the long run.

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Status of Health Sector Reforms in Khyber Pakhtunkhwa: A Post-Devolution Analysis

Mutawakkil Ahmad Abbasi and Iftikhar Ahmad

Pakistan Institute of Development Economics (PIDE), School of Public Policy Pakistan

Keywords: *Health; Reforms; Decentralization; Pakistan*

Introduction

Decentralization brings power and authority closer to people. Experts believe that decentralization and devolution of power lead to an improved health sector. The essence of democracy lies in devolution which promotes social and economic transformation of an economy. A centralized system of government looks at the picture holistically and a decentralized government sets its own set of priorities in the region. Devolving power to the lower tier helps the system gets diversity in a way that more people are involved in the decision making processes. Political representatives become more accountable and thus the service delivery gets better. Many experts of devolution are in favor of including local representatives over important services like Health (Shah, 2004; World Bank, 2006; Yilmaz & Serrano-Berthet, 2008). However, developing countries tend to have a centralized form of government which therefore needs the decentralization of power and its promising prospects to keeps the region driving ahead.

In Pakistan, the 18th constitutional amendment transfers some powers to the provinces. This was successfully implemented as the devolution of power to the lowest tier; the essence of the 1973 constitution of Pakistan. This amendment empowered provinces to legislate and implement policies related to the devolved ministries on their own. This amendment devolved the power of 17 central ministries[24] to the second tier of provincial governments in 2010.

[24] Ministries of Education, Health, Culture, Special Initiatives, Environment, Labor and Manpower, Local Government and Rural Development, Minorities Affairs, Population Welfare, Social Welfare and Special Education, Sports, Tourism, Women Development, Youth Affairs, Zakat and Ushr were devolved in phases after the introduction of 18th Amendment of the 1973 Constitution of Pakistan.

Among them the powers of the Ministry of Health were also defined as provincial subjects. The provincal health sector, after taking charge, has started formulating policies with the goals of obtaining fruitful results for their respective provinces. However, Pakistan has failed to still achieve real progress in the devolution of power, and provincial governments are not in a position to exercise the devolved power in a true and manner since the 18th constitutional amendment passed in 2010. While the devolution of power to lower tiers is considered to expedite economic growth and sustainable development, research in this area is lagging.

Objective

The main objectives are to find the priorities of the government's post devolution via looking at expenditure pattern and to discover whether the 18th Amendment improved service delivery in Health; and to identify policy recommendations to further strengthen the process of devolution in Pakistan.

Methodology

This study builds upon the conceptual framework designed by Bossert and Mitchell (2011). However, certain adaptations are incorporated to further improve upon and to match the objectives of this study. Bossert and Mitchell's study observed that service delivery is improved with improvements in Decision Space (DS), Institutional Capacities (CAP) and Accountability (ACC) of an institution.

Institutional capacities is primarily included to assess the capabilities of a department to understand, interpret and/or transform knowledge into practice. Training, education and experience, facilities and technology available to the respondent after the 18th amendment are assessed under this sub-theme about a particular indicator. The technical, administrative, organizational and financial aspects were considered. Decision Space (DS) covers the authority to take a decision of the concerned departments (Bossert, 1998). Accountability is considered an important instrument in determining the efficiency of an organization. This was assessed by asking the government officials of concerned departments about steps taken against complaints.

In this study, there was a three stage data collection process involved. At first relevant respondents from the Health Department were identified followed by identification of concerned respondents from Hospitals. For perception survey data was collected from the people who were using publicly provided health facilities. The primary part of the study dealt with 112 respondents. For the quantitative part, to analyze the trend analyses, relevant data was collected from 2006 to 2016. Primary data were collected from Ministry of Health and other government officials of the Health Department, while secondary data were gathered from government officials.

Results and Discussion

A paradigm shift could be assessed in a sector via two ways. The first considers the government's initiation for new legislation by passing more bills in a certain sector as compared to other sectors. The second way is to look at the increase or decrease in budget allocation against a sector, to see what spending priorities are. The study considers the second way approach for a paradigm shift after the implementation of 18th amendment. The perception survey conducted for this study is a tool to verify government claims and the patients' satistfaction with developed health sector services. According to this survey, 85 % of the respondents of the study were happy and satisfied to use government health care facilities. Free medicine claim was backed up by 61% of the sample size while 27% of the respondents had a difference of opinion. The study found that about 61% of the patients, who use government hospitals, got free medicines. There is still room for improvement as 27% of the patients were complaining about the supply shortages of medicines in government hospitals. 72% of the sample agreed to the claim that absentees of doctors in hospitals have reduced significantly. 77% are of the view that there is an improvement in the health sector over the past few years while around 17% are still to see any improvement in health sector. The result has been significant in a sense that people who got free medicines also believed that health sector has shown progress.

The above satisfactory achievements were made with positive trend of budget allocation towards the provincial health services by the central governments and own projects implemented by provincial health Departments using

financial support from the international donor agencies. Devolution power to the provinal health ministry enhanced their capacity to gain own financial improvements with foreign partners as well. Expenditure in the health sector showed an upward trend, specifically after the devolution of health sector in 2010. Prior to the introduction of devolution, spending on health was just 2% of the total budget which increased to over 4% after the devolution of the health sector. The nature of change can be seen in institutional development and infrastructural development post 18th amendment. Many special programs were initiated for improving public-sector healthcare facilities of the province with the support from agencis such as JICA, GIZ, UNICEF and DFID. Under the "Project for Strengthening Routine" 80% of children were covered with full immunization which was only 53% prior to 2010; the health insurance project covered around 1,800,000 families; all the government run hospitals are directed to provide free medicines to the patients; malarial control programmes intiated; safe blood transfusion programmes center was established.

The department has found a positive response from the government of Khyber Pakhtunkhwa about budget acceptance. The change in attitude has helped the health sector exceed its potential. Over the past few years, the budget for the health department has been increased from Rs.1, 949.696 million to Rs.21, 576.133 million. With the introduction of the 18th amendment, supervision of the performance of government hospitals has increased. The institutional capacities of the hospitals rests in finding out if the health care service providers are sufficient in infrastructure, technological instruments, medicines and staff. The government has provided the latest technology for carrying out the administrative operations smoothly. Medicines are delivered to hospital sooner than other things.

Conclusion

The study concluded that the devolution of power for the health sector has been followed by the initation of promising changes. These changes were, an increase in budget allocation, introduction of effective laws and accountability mechanisms, and improving the effectiveness and efficiencies of state run

health facilities. This study concluded that working on improving institutional capacities, decision space and accountability, and service delivery would raise the quality of service delivery upto the optimum level. It noted that not only *de jure,* but *de facto* power too contributes in bringing a positive change. The devolution keeps the system motivated and hence helps in improving service delivery in a sector. The study found out that the 18th constitutional amendment in Pakistan has reshaped historic trends in the provincial helath statues. The provincial government has resulted in increases in the budget to improve their Institutional Capacities, and Decision Space as well as accountability of the hospitals. The service delivery in the provincial health sector been improved both quatitatively and qualitatively after the devolution of power. Therefore, this study recommends that the real service transformation through devolution of power from central Government to local political tiers is needed, which will expedite social sector development through heath improments which lead to higher level human capital formation and economic development in Pakistan.

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Chronic Kidney Disease of Unknown Aetiology: A Review of Literature on the Socio-economic Aspects

V. Ratwatte[1], W. Athukorala[2], S. Y. Bandara[3] and R. Gangahagedara[4]

[1] PGIHS, University of Peradeniya, Sri Lanka
[2]Department of Economics & Statistics, University of Peradeniya Sri Lanka
[3]National Non-communicable Diseases Bureau, Ministry of Health, Sri Lanka
[4] PGIHS, University of Peradeniya, Sri Lanka

Keywords: *CKDu; Literature; Agriculture; Sri Lanka*

Introduction

The global burden of Chronic Kidney Disease (CKD) continues to increase not only because of its higher prevalence of traditional causes, such as diabetes and hypertension, but also CKD resulting from infections and unknown aetiology. Endemic occurrence of Chronic Kidney Disease of unknown etiology (CKDu) is reported in Sri Lanka, Bangladesh, India, Nicaragua and El Salvador. It has been a prevalent environment-related national health issue for two decades in Sri Lanka. As the term CKD in Agricultural Communities (CINAC) reveals, a close relationship is drawn between agriculture and the particular socio economic status of the farmer and CKDu. It is the eighth factor for mortality in Sri Lanka and reportedly was the cause of 13.8 % of mortality in 2017.

Research in this area claims tentative causes for CKDu which include high fluoride contents in groundwater, presence of toxins produced by cyanobacteria in surface waters, particularly in freshwater reservoirs, excessive use of agrochemicals, consumption of contaminated (heavy metal pollutants from agro-chemicals) and consumption of water-based plants such as nelum and kohila, and Tank fish. Some studies have hypothesized that high concentrations of Cadmium, Arsenic, smoking tobacco, excessive dehydration in the work environment of farmers, and genetic predisposition are factors

contributing to the prevalence of Chronic Kidney Disease of unknown aetiology. Numerous studies have been conducted by a range of institutions and researchers in relation to the problem. However, there is yet to be more research done in relation to this area, more specifically, the lack of identifying definite causes hampers its diagnosis. Moreover much research is to be conducted in exploring the terrain of the socio-economic aspects of the disease. This paper aims at reviewing existing literature in this area.

Objective

Given this background this study is attempting to review available literature on the socio-economic aspects of CKDu in Sri Lanka as well as other countries in the world.

Methodology

Information for this review is congregated using journal articles as well as book chapters from Medical, Science, Environmental and Economics sources.

Results and Discussion

Main studies conducted in Sri Lanka: Weerasekara (2017) observes, in a study conducted in Kabithigollewa, indicants of CKDu being, male farmers, who have high risk of CKDu, with a mean age of 60 years. Majority of patients have earned a monthly wage of Rs. 10,000/= and are observed to have scarcely completed education from grade 1 to 5. The studies reveal a pattern where poverty endemic areas connected with the agrarian practices and lifestyle, have a close relationship to CKDu. The author emphasizes educational level, awareness and occupation as factors for the predisposition of CKDu. Ranasinghe et al. (2011) give a detailed analysis of the process and cost of hemodialysis in Sri Lanka and give a proper framework for modeling financial audits. Senanayake (2018) discusses physical suffering and has validated the Chronic Kidney Disease Symptom Index – Sri Lanka, which attempted a quatification of symptom burden compounded through the prevelance and perceived severity of the disease. It also discusses psychological suffering due to effects of the illness, changes in family dynamics functional restrictions etc; social suffering, suffering of family, economic suffering, hospital admissions costs, household costs of dialysis patients and perceptions regarding kidney transplant within the CKDu affected community. Cooray et al. (2019)

investigate water quality of groundwater in North Central Province and its suitability for drinking purposes in the dry zone of Sri Lanka. This study introduces Water Quality Index (WQI) and reveals that only 3.8% in the wet season and 2.6% in the dry season are categorized as excellent WQI. Wijewickrama et al. (2019) try to determine a multilevel clinical case definition that is simple and easy to apply in a resource poor setting and allow participants, CKDu experts, nephrology specialists, experts on primary care, to diagnose CKDu at different levels of specificity. The definition is based on international clinical standards and laboratory criteria and thus can be used to detect CKDu across communities and regions.

Main studies conducted in other countries: Johnson and Sanchez - Lozada (2013) provide new findings from first renal biopsies of patients with Mesoamerican nephropathy; exposure to agro-chemicals, heavy metals, silicate, intake of fructose-rich soft drinks, use of non-steroidal anti-inflammatory drug (NSAIDs), tobacco use, and nutritional factors as suspected causes. These causes are repetitive for most CKDu affected areas in the world and is endemic to a certain socio-economic praxis. Hossain et al (2009) discuss how poverty and social deprivation are known to affect the predisposition, diagnosis and management of CKD. He states that that the poor and socially deprived have greater prevelance for end stage renal disease and lesser access to renal care, dialysis and transplantation. López-Marín et al. (2014) characterize the histopathology of CKDu of patients in Salvadoran agricultural communities. It identifies morphological changes in different stages in the evolution of CKDu irrelevant of age, sex and occupation. Abraham et al. (2016) discuss hotspots of CKDu in Sri Lanka and India and draws race and environment as factors for CKDu. There is an emphasis in the discussion of Nephrology care provided in Bangladesh, India, Pakistan, Nepal, Bhutan and Sri Lanka. Orantes-Navarro (2017) discuss hypotheses of CINAC aetiology, the toxic exposure in agrarian societies and heat stress due to regular episodes of dehydration, contaminated environment, and the absence of CINAC in hotter northern Sri Lanka, Myanmar, Cuba where agro-chemicals are scantily used. Ramirez-Rubio et al. (2013) give epidemiological, astrological and public health dimensions of CKD while Caplin et al. (2018) presents a framework for the collection of data to allow CKDu detection to be reproducible and for new studies. The study observes two issues at present, firstly, the scarce and poor quality data collection in many CKDu endemic

areas and secondly, the difficulty in differentiating whether the recorded kidney disease is due to CKDu, where a CKDu biopsy has already provided a diagnosis.

Conclusion

Definite causes for CKDu is constantly debated on by researchers and professionals and the causes are, to date, stipulated causes. Counter- research shows there is yet to be more substantial evidence to prove that agro-chemicals have a strong relationship with CKDu. Most studies support the argument of the relationship between CKDu and water quality or agrochemical usage. However, available literature are only incorporating medical or scientific reasons to identify the causes of it. In this context, more studies are required after incorporating socio-economic, historical, psychological and cultural variables to identify real causes of CKDu in the country. Moreover certain researches, such as Jayasumana (2017) are adamant to prove one factor, such as agro-chemicals, as pivotal for CKDu while not debating the possibility of the multifactorial origin of CKDu. Specially, there is still aneed of more research on the case of CKDu and positive steps such as collaborative research among different researchers, institutions and stockholders.

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INVITED PAPERS

Micro-Equity for Microenterprises[#]

Suresh de Mel[1], David McKenzie[2] and Christopher Woodruff[3]

[1]*University of Peradeniy, Sri Lanka*
[2]*The World Bank, USA*
[3]*University of Oxford, UK*

Keywords: *Micro-equity; Microenterprises; Microfinance; Alternative Financing, Contract Enforcement.*

Abstract

Many microenterprises in developing countries have high returns to capital, but also face risky revenue streams. In principle, equity offers several advantages over debt when financing investments of this nature, but the use of equity in practice has been largely limited to investments in much larger firms. We develop a model contract to make self-liquidating, quasi-equity investments in microenterprises. Our contract has three key parameters that can be used to shift risk between the entrepreneur and the investor, resulting in a continuum of contracts ranging from a debt-like contract that shifts little risk from the entrepreneur to a pure revenue-sharing contract in which the investor absorbs much more of the risk. We then report on a proof-of-concept trial carried out by an investment partner, which made nine investments averaging $3,800 in Sri Lankan microenterprises. This pilot demonstrates that our contract structure can work in practice, but also highlights the difficulties of micro-equity investments in an environment with weak contract enforcement.

JEL Classification codes: O12, O16, G21.

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Affect-Based Decision Making: Entrepreneurship in Industrially Backward Regions

Debdatta Saha

Faculty of Economics, South Asian University, India

Abstract

This paper investigates the problem of entrepreneurship (more precisely, the issue of business expansion) in industrially backward regions. With the example of the typical entrepreneur who is limited to market its product in the region and with no export business, we model his/her mindset using regret-based decision-making with a regional dimension. The way we implement this is through a region-specific counterfactual thinking (rCFT), which measures the extent of regret in the mindset of the entrepreneur in doing business in that region due to lack of outside options. For such an entrepreneur, it is likely that there will be significant negative rCFT which is attributable to difficulties of doing business in a particularly backward area. We find that rCFT is related to the perception of risk in doing business for entrepreneurs from a primary survey in an industrially backward state of India (Bihar). Literature shows that with a high perception of risk, expansion of business is unlikely. This investigation shows that experience and information access mitigate this negative affect and therefore, this kind of exercise has clear policy implications for the development of entrepreneurship.

Keywords: *Region-based counterfactual thinking (rCFT); Affect-based decision making; Risk perception of entrepreneurs; Industrial backwardness.*

Introduction

A large body of literature exists on entrepreneurship, starting with seminal work by Schumpeter (1934) continuing in the neo-classical mainstream with studies by Kihlstrom and Laffont (1979) and Baumol (1993), in the discipline of economics. Recent advances in entrepreneurial research has incorporated the important question of entrepreneurial identity; for instance, Murnieks and Mosakowski (2007) which assumes an important dimension in industrial spaces with low business concentration and therefore, sparse business networks. Defining entrepreneurial identity as a set of beliefs ‘’commonly’’ held by the population and internalized by the cognitive processes of the entrepreneur, the literature points out its relation to roles that are attached to this identity. In a sense, these roles assign meaning to the term entrepreneur. A comprehensive view of these roles comes from Shane and Venkataraman (2000), who interpret an entrepreneur as a person engaged in the discovery, examination and exploitation of opportunities. We contend that roles are

not sufficient in themselves to provide a meaningful interpretation of entrepreneurial identity. We argue for the incorporation of the spatial context in the definition of who is an entrepreneur. The specific manner in which we do this is mentioned in the research questions below.

Research Questions

In this paper, we investigate the following research question: *How does the region influence behavioral attitudes of entrepreneurs?*. This overall question is discussed in the specific context of regions which are not industrially developed. Essentially, the entrepreneur's market size is limited to the domestic market and is assumed to have limited outside options. There is a large literature on forced entrepreneurship, where lack of other opportunities leads to the occupation of entrepreneurship. Add to this the problem of a limited market size. This backdrop, though very narrowly defined, marks the regional realities of doing business in many small towns and cities in India and other developing countries. In the context of limited outside options, the entrepreneur has to face the uncertainties of doing business and decide on future business plans. Entrepreneurial behavior that we investigate is the decision-making regarding expansion of business in a region with the attributes that we discuss. We borrow on the literature on regret-based decision making from behavioral decision-making to work out a theory of entrepreneurial thinking along the following precise lines: *When does an entrepreneur display negative counterfactual thinking (CFT) in their decision-making due to regional constraints (region-based CFT or rCFT)?; What is the effect of this kind (negative CFT) of affect in entrepreneurial decisions?; What factors influence rCFT?*

The rest of the paper is structured as follows: section II presents the relevant review of the literature along with the contribution of the paper to the literature, section III discusses the methodology of the paper, section IV discusses the empirical claims and results and section V concludes.

Literature Review

Is it possible for a regional government to foster entrepreneurs in a region with very little entrepreneurship and low industrial base? To answer this, we integrate the notion of entrepreneurial identity with the literature on entrepreneurial cognition, mostly emotional/affect-based decision-making. Very few papers have clearly pointed out the link between the identity based and the cognitive approach to entrepreneurship, which is critical for the context that we are interested in whereby ordinary individuals become active entrepreneurs in difficult business environments. One exception in the entrepreneurship identity literature is Burke (2004). By likening the process of entrepreneurship to control systems, he forcefully links identity with counterfactual thinking (CFT). He defines the process of entrepreneurial identity as: "A cyclical process occurs when an individual takes some action, views that action, evaluates the results in comparison with the standards embodied within an identity, and then incorporates this new information to modify his or her behavior to improve

the expected results." Behavior is continually altered until feedback matches the identity standard (Burke 1991a). A perfect match results in self-verification leading to a variety of emotions (ranging from satisfaction to elation) depending upon the context. When the match fails to take place, self-verification fails leading to cognitive dissonance and varying levels of distress (Burke 1991b). The in-built identity(ies) then motivate behavior modification until feedback matches identity standards, so that the individual can avoid distress associated with the lack of self-verification and enjoy the positive outcomes where self-verification is achieved (Burke 1991b).

How does regional/local contextualization matter in defining identity? Our paper shows that this aspect of local identity shows up in a particular kind of cognitive counterfactual thinking (CFT), particularly in regions with poor industrial infrastructure and outcomes. To build this context, we borrow the definition of entrepreneurial identity from Haynie et al. (2009), who define entrepreneurship as a process of envisioning the future. This process necessarily entails CFT of the kind "what might have been had different actions been undertaken or had circumstances been different". However, CFT is a broad collection of cognitions that an entrepreneur engages in situations of stress, as pointed out earlier (Baron 2000, Markman et al. 2005). CFT is in a sense a display of cognitive dissonance and allows the entrepreneur to explain away unpalatable outcomes and situations to themselves in order to move ahead (Wadeson 2006). Therefore, CFT belongs to the class of regret-based decision-making models. There are many kinds of CFT and it is therefore unsurprising that the empirical evidence about entrepreneurial CFT is not conclusive. While some researchers (Baron 2000) show that entrepreneurs do not engage in as much CFT as non-entrepreneurs, Gaglio and Katz (2001) and Gaglio (2004) in fact show that entrepreneurs have very complex thinking processes and engage in significant CFT. It is at this point in the literature that we start working by picking up a very precisely defined type of CFT, which is linked to an entrepreneur‟s regional identity and show its effect on behavior which we again define narrowly as entrepreneurial risk perception, which papers such as Sitkin and Pablo (1992) and Sitkin and Weingart (1995) show are crucial in the risk-taking behavior of entrepreneurs.

Contribution to the Literature

The literature review section above clearly shows that entrepreneurial decision-making has been studied in the behavioral economics literature using various heuristics, one of which is regret-based decision-making. Counterfactual thinking or CFT is one of the possibilities of depicting affect-based decision-making. Most of the literature considers CFT per se, without qualifying it with other factors that are the likely generators of CFT in entrepreneurial mindsets. We introduce the notion of region-based CFT or rCFT as a concept that captures the notion of regret due to constraints posed by industrial backwardness of a region in entrepreneurial decision-making. Using this concept, we contribute not only to the literature on regret-based decision-making but provide a different answer to the standard question of why do small businesses not expand in developing countries. This leads to dual structures of

large and small businesses co-existing with each other. It is not the problem of lack of infrastructure support such as finance for working capital that alone is responsible for non-expansion. The entrepreneurial mindset, which considers environmental variables in a particular way, determines whether or not business expansion is likely or not. We show that as an entrepreneur gains experience and has region-specific knowledge of supply chains affecting their business, the negative affect in doing business and perception of risk goes down. Hence, irrespective of the objective constraints in running a business in an industrially underdeveloped region, an experienced entrepreneur has positive affect in their thinking, which leads to plans for business expansion. It is for the novice entrepreneur, who lacks region-specific knowledge, which negative affect and high risk-perception in business operations predominate.

Methodology

We present here a theoretical framework that introduces the concepts of non-physical costs as well as rCFT. Using this, we test the predictions for a set of entrepreneurs in an industrially backward state of India, Bihar.

Theoretical Framework

Suppose that a region B is backward industrially, in contrast with another region N that is relatively more advanced. What we mean by industrial backwardness is that the industrial ecosystem (as defined in Yülek 2018) is not developed, resulting in multiple obstacles in accessing finance or clearances to start or expand business. Our focus is on the small entrepreneur in such a region, contemplating expansion of business. How does such an individual decide on future course of actions, given her/his experience with the difficulties with the region's infrastructural backwardness? To bring out the results in sharp focus, we assume that the entrepreneur cannot export his products and is constrained to sell his/her products/services in the local market.

Assumption 1. The typical entrepreneur in region B is not able to export to regions outside B.

Among many possible reasons, we highlight the constraints posed by clearances and finances for satisfying certification and labeling standards that are a challenge in region B. This is very much the case with the processed food market, where industrially backward regions have large sources of agri-output, but infrastructural issues imply that processing industries are located mostly outside these regions. This assumption ensures that there are no externalities in rCFT. All the actions of the entrepreneur is tied to regional realities, with no external influences. Now, consider the mindset of this typical entrepreneur. We use the notion of regret-based decision making and highlight that most of the decisions of the entrepreneur will be marked

by a rCFT (region-specific counterfactual thinking). The way we model rCFT is through the question:

Would the entrepreneur expand his/her business in region B had he/she not been a native of that region?

Why do we frame the question in this manner? Essentially, we are probing the nature of regret in the mindset of the entrepreneur who is tied to a backward region with its own demand and infrastructure constraints. Being forced to operate out of a region like B, any failures in business expectations is likely to be reflected in the entrepreneurial mindset through a negative emotion/affect. We model this negative affect through this question. An answer such as *"yes, I would not do business in this region had I not belonged to this region"* brings out the negative affect/sense of frustration of having to locate in region B relative to some other region N. An answer such as *"no, I would still do business in region B even if I were not a native of B"* brings out positive affect. It also stands testimony for the innate potential of the region to foster entrepreneurship (maybe in terms of plenitude of raw material resources). Any answer which is indeterminate or uncertain reflects absence of rCFT in this framework. How do we find out how this theory will work in real-life settings? We need to link rCFT with some standard notion, such as perception of risk to work out empirically testable hypotheses. We did this for the industry of food processing in Bihar, India in 2016-17 through a primary survey. This region (Bihar now represents B in our theory) satisfies the conditions of industrial backwardness (see Mukherji and Mukherji 2015, for instance) that we describe. Further details on this are in the following section.

Empirical Test of Theory: Primary Survey among Entrepreneurs in Bihar, India

We derive our estimates of rCFT and risk perception through an empirical exercise using a primary survey among formal registered units (partnerships as well as limited liability companies for a total of 76 units) in Bihar in 2016-17 as part of an IGC-funded project "Study of the Food Processing Sector in Bihar". There is no published literature attempting this exercise for Bihar and there are many difficulties in contacting individual entrepreneurs through surveys (for instance Munshi (2010) details the difficulties of surveying entrepreneurs in the diamond trading and polishing industry). We selected the food processing industries for conducting our survey, as Bihar has a natural input advantage in terms of agricultural raw materials.

Our sampling method is based on snowball sampling, as discussed in Noy (2008) and Newman (2018). This sampling technique is non-randomized and appropriate when the population is not known with certainty (for example, for hidden samples and networks). It is impossible to note at a point in time the total number of functional units unless the scale of the survey is very large, such as the ASI (Annual Survey of Industries). Given continuous entry and exit, exact data on the population of functional units is a rough estimate. The primary reason is that there is no legal

restriction on an exiting firm to inform any authority that it is leaving business in any state in India. Lack of an industrial exit policy has exacerbated this problem. This problem apart, we found in our initial interactions with one of the prominent business association in the state (Bihar Industries Association (BIA)) that no individual entrepreneur would be forthcoming in their interviews unless given a proper reference for the surveyor, similar to the problems mentioned in Munshi (2010). We conducted a mixture of telephonic and face-to-face interviews of entrepreneurs mostly from several districts in Bihar (such as Muzaffarpur, Patna, Gaya, Nalanda and Hajipur etc.). Two of the units surveyed resulted in managerial interviews and not that of the original entrepreneurs and hence were not included in the final sample for understanding perception of risk.

Defining Risk Perception and rCFT in Entrepreneurial Identity

As investment behavior and industrial outcomes are driven by perception of risk, rather than objectively measured risk, we focus on the variable of perceived risk. As mentioned earlier, we define the perception of risk in doing business as combination of production, marketing and security of property challenges that adversely affect profits. We do not segregate between different types of business risk, rather the total risk in operations (as a combination of production, marketing and protection of investment). We measure risk perception through two instruments: (i) as a single variable that adversely affects profits of the enterprise: we measure this in two ways: one, as a direct scale measure of risk perception and second as a categorical variable with two categories (low risk and high risk). The first is a scale measure of perception of total risk for an entrepreneur. It is measured on a scale of zero to five, with zero reflecting very high-risk perception and 5 reflecting minimal risk perception. The categories 1 and 2 reflect high risk perception (value less than or equal to the average of 2.5) and low risk perception (value greater than 2.5) respectively. The cut-off of 2.5 is based on the mean value from N=72 valid responses for this question. We refer to this categorized measure as the ``risk code".

(ii) through a location-specific counterfactual: as a Bihar-specific issue that would not be present, had the entrepreneur been operating in another state. We asked the entrepreneur whether he/she would do business in Bihar had he/she not originated from Bihar and was an outsider. This, as we discussed earlier, is a direct query about the nature of rCFT in the mindset of the entrepreneur.

Testable Empirical Claims and Results

Given our research objective, our testable empirical claims are:

H0. Entrepreneurial identity generated by domicile state of the entrepreneur (measured through a location-specific counterfactual rCFT) is correlated with risk perception.

H1a. (Business Specific Linkage) Risk perception (and rCFT) is a function of the specific sub-sector in which the entrepreneur operates.

H1b. (Resource Specific Linkage) Risk perception (and rCFT) varies according to enterprise size, land holding and access to finance.

H1c. (Attribute Specific Linkage) Risk perception (and rCFT) varies according to father's occupation or entrepreneurial experience.

For our sample of entrepreneurs, we find evidence in favor of the first claim alone, and not the others. As Table 1 clearly demonstrates, entrepreneurs with negative affect (as expressed by a negative rCFT) also have a high perception of risk. This is the opposite for those with positive rCFT. Entrepreneurs with no rCFT reveal no identifiable pattern with respect the perception of risk. It is surprising for us to find that there is no empirical support for any of the other empirical claims, particularly H1b. or H1a. The nature of business (the sub-sector of food processing, such as dairy or grain-milling, do not influence perception of risk directly. Is it the case that rCFT is a sufficient statistic, which already accounts for these other effects on the perception of risk.

We find some support for such an argument, as we find that the perception of risk is as we find low risk perception is strongly associated with more experience of the entrepreneur (Saha, 2019). Additionally, in Table 2, we find that more memberships in business associations. Hence, it is likely that information access, facilitated by membership in associations and experience of the entrepreneur mimic much of what is reflected in the other hypotheses. In fact, this is in line with what we claimed earlier: entrepreneurial experience can roughshod over many infrastructural problems in a region such as B. For a seasoned entrepreneur, the perception of risk is no longer tied to the constraints of the region. Rather than negative affect, such an entrepreneur reflects positive affect and has plans for business expansion.

Table 1: Risk Code * rCFT Crosstabulation

Risk Code (RC)	rCFT Uncertain (no rCFT)	No (negative rCFT)	Yes (positive rCFT)	Total
Risk Code 1 (High R)	6	23	5	34
Risk Code 2 (Low R)	4	17	16	37
Total	10	40	21	71

Source: Author's own publication in the Athens Journal of Business and Economics, 2019 and the IGC Report on the Study of Food Processing in Bihar.

Table 2: Risk Code* Membership Crosstabulation

Association Membership	Business Association Membership		
	RC 1 (High Risk / %)	RC 2 (Low Risk / %)	Total (%)
Zero	21 [0.55]	17 [0.45]	38 [100]
One	11[0.41]	16 [0.59]	27[100]
More than One	2 [0.33]	4 [0.67]	6 [100]

Source: Author's own publication in the Athens Journal of Business and Economics, 2019 and the IGC Report on the Study of Food Processing in Bihar.

Conclusion

Regions with industrial backwardness pose special challenges to the development of entrepreneurship. We try to understand the core reasons for non-expansion of business by entrepreneurs in such regions, using regret-based decision-making (the notion of rCFT). While negative rCFT and high risk perception are present in our empirical data, we rely on existing literature to conclude that it is these entrepreneurs (without significant experience) who would not be interested in expanding business in such regions. With more sources of information (membership in associations) and experience, the results are likely to change.

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Analyzing Public Expenditures' Efficiency for EU Countries Using Data Envelopment Analysis

Marius Sorin Dincă[1], Gheorghita Dincă[1] and Ileana Tache[2]

[1]Department of Finance, Accounting and Economic Theory, Faculty of Economic Sciences and Business Administration, Transilvania University of Brasov, Romania
[2] Department of Marketing, Faculty of Economic Sciences, Business Administration, Transilvania University of Brasov, Romania

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Introduction

The efficiency of allocating and using public financial resources remains a subject of great interest for academic and political environment, as well as for the civil society. Numerous studies and researches were dedicated to analyzing public sector's performances and the efficiency of using public resources (Afonso and Kazemi, 2016; Emrouzenjad, 2014; Afonso et al. 2006). Most of studies are focusing on the efficiency of governmental expenditures and upon the taxation system used for collecting public revenues. Institutions as World Bank, International Monetary Fund and others alike are expressing their concerns about governments' lack of efficiency and productivity. It is easy to understand that a country which increases output will spend more, yet increased spending should be efficient (Peacock, 2004). Afonso et al. (2006) considers there are two ways of spending public resources, respectively with wrong goals and with correct goals. To establish the efficiency of public money's allocation we need to establish the relation between entries (inputs), exits (outputs) and results (outcomes). Farrell (1957) studied the aspects of efficiency and of public sector's importance. The purpose of expenditures' allocation should be the increase in productivity and efficiency, without committing more resources and to obtain maximum of results with minimum of resources. Over the time this issue attracted more and more interest from economists and was studied ever in more detail. DEA was introduced firstly in 1978 by Charnes, Cooper and Rhodes to become one of the most used non-parametric methods to measure efficiency and productivity in using public or even private resources. DEA was used in areas where it is necessary or useful to evaluate public sector's results, such as hospitals, health ensuring system, education system, yet it can be also used in the private sector such as in banking or financial sector.

Objectives

The main objective of our current paper is to analyze the efficiency of public expenditures for the 28 EU member countries using Data Envelopment Analysis (DEA). The inputs are represented by the average of overall public expenditures as a percentage into GDP for a 10 years period, respectively for the 2006-2016 period. To identify the outputs we have followed public sector performances for six categories:

administration, education, health, distribution, stability and economic performances. Each category includes one up to three measures.

Methodology

Our current study has for main purpose analyzing the efficiency of allocating and using of public financial resources in the 28 EU member countries, by the means of Data Envelopment Analysis. The DEA method is a model based on frontier points. We have chosen as an input measure the average level of public expenditures as percentage of GDP. The average was calculated for a 10 years interval (the 2006-2016 period). For the output measures we have deemed as appropriate the structure realized by Afonso et al. (2006), as presented in Table 1 below.

Table. 1: Public sector performance indicators

Public sector performance	
Opportunity indicators	"Musgravian" indicators
Administrative	1. Distribution
Corruption	- Gini coefficient
Red tape	2. Stability
Quality of judiciary	- Inflation (10 years average)
Shadow economy	- Stability of GDP growth
Education	3. Economic performance
Quality of math and science	- Unemployment
Health	- GDP real growth
Infant survival rate	
Life expectancy	

Source: Afonso et al. (2006)

To estimate public effects, we have calculated the measure called Public sector performance (PSP). This measure has two components, respectively the opportunity measure and the *Musgravian* measure.

Empirical results

Applying DEA for the sample made of the 28 EU member states generated 2 efficient countries (Ireland and Romania) for both the inputs and the outputs. Ireland has the highest public efficiency score (1.29), followed by Romania with a score of 1.24 (see Appendix no.1). Bulgaria can be deemed as efficient inputs-wise, whereas Lithuania is efficient only from the output perspective. Of the EU founding countries, Belgium, France, Germany, Italy and Luxembourg are located above average, around the 0.8 value. They are all developed countries, with high expenditures, yet they obtain also corresponding results. The real GDP growth brought about an advantage for developing countries. Figure 2 reveals countries' distribution according to their standardized values of average input and output variables.

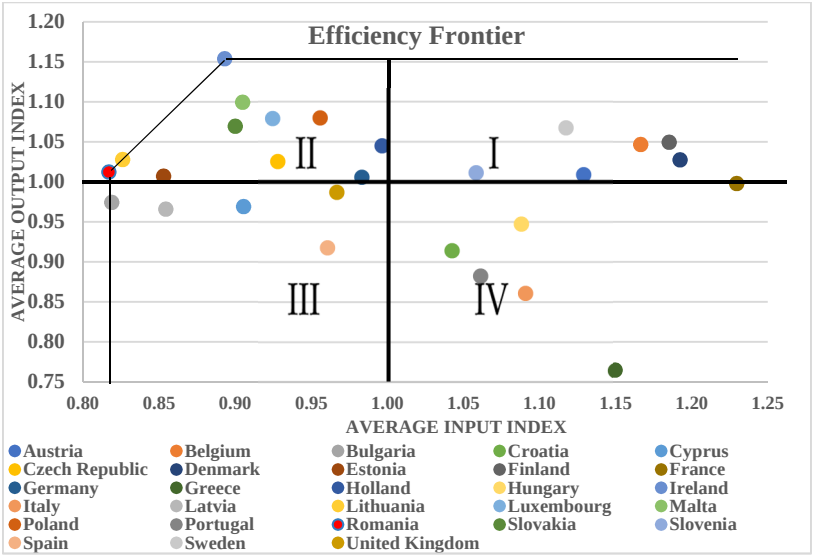

Figure 2: The distribution of the 28 EU countries according to frontier efficiency
Source: data processed by the author

The Figure 2 displays the inclusion of all EU states inside the space bounded by the frontier passing nearby the extremities points and represented by two countries, respectively Ireland and Romania. Ireland is represented by the pair of coordinates (0.893; 1.154). This country records the highest average output index and below the normalized value of 1 in case of input allocation. This proves that public administration uses available financial resources with the best results in terms of public services provided to its inhabitants. Also located on the frontier efficiency curve is Romania, which succeeds to register the lowest input, being very close to the Oy axis. Romania's coordinates are (0.817; 1.012). Both DMU's mentioned are located in the best quadrant (II), respectively far from the Ox axis (sustainable output) and close to the Oy axis (low inputs).

According to Figure 2, Lithuania also seems to be placed on the efficiency curve. However, the final efficiency score both in the input-oriented case and in the output-oriented scenario prove to be just a little bit below 1. The *cloud* bordered by the frontier is made of 26 countries and their inefficiency degree is measured by the distance to the frontier curve. The worst results are recorded by the countries located far right and way down, i.e. the countries which spend more money (far from the *Oy* axis) and generate unsustainable outputs (closer to the *Ox* axis) as compared to rest of the countries. Greece, Italy, Hungary, Portugal and Croatia are placed in fourth quadrant and may be included in the unsustainable and inefficient output typology.

Conclusion

The results show that developed countries, EU founders, register levels above EU's average in what concerns resource use efficiency. Romania and Ireland were found to be the most efficient countries, respectively they produced the most possible output for one Euro of input. The results have to be interpreted cautiously since that does not guarantee (especially in case of Romania) that the country delivers the best quality services for its citizens. This is similar to the difference between profitability ratios and profit. A small company can have a return on equity of 50% but total profit it is only of one million Euro, whereas a big company can display a ROE of only 9% but having a total profit of one billion Euro. Apparently, the smaller company is more efficient but the shareholders of the bigger company are much happier. Nevertheless, this does not mean that DEA is not an effective instrument to analyze efficacy and efficiency, since the output measures cover a different array of areas and aspects. Greece, Italy, Hungary, Portugal and Croatia are located in the fourth quadrant and this means that they are not very efficient (they do not generate the amount of output required for the amount of input they use). Also, the countries located below the efficiency frontier should probably improve their efficiency to guarantee a better use of taxpayers' money. To improve the research, a future line of study could be represented by the diversification of the output measures to include more qualitative ones, including the results of direct polls and surveys.

References

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Appendix: DEA Results

Table 1: Results of the analysis

DEA results			Public performance
Country	Input	Output	
Austria	0.72	0.87	0.89
Belgium	0.70	0.91	0.90
Bulgaria	1.00	0.96	1.19
Czech Republic	0.88	0.89	1.10
Cyprus	0.90	0.84	1.07
Croatia	0.78	0.79	0.88
Denmark	0.69	0.89	0.86
Estonia	0.96	0.93	1.18
Finland	0.69	0.91	0.89
France	0.66	0.86	0.81
Germany	0.83	0.87	1.02
Greece	0.71	0.66	0.67
Ireland	1.00	1.00	1.29
Italy	0.75	0.75	0.79
Latvia	0.96	0.89	1.13
Lithuania	0.99	1.00	1.24
Luxembourg	0.90	0.94	1.17
Malta	0.96	0.95	1.22
Netherland	0.82	0.91	1.05
Poland	0.89	0.94	1.13
Portugal	0.77	0.76	0.83
United Kingdom	0.84	0.86	1.02
Romania	1.00	1.00	1.24
Slovakia	0.95	0.93	1.19
Slovenia	0.77	0.88	0.96
Spain	0.85	0.80	0.96
Sweden	0.74	0.93	0.96
Hungary	0.75	0.82	0.87
Average	0.84	0.89	1.02
Minimum	0.66	0.66	0.67
Maximum	1.00	1.00	1.29