The Economics of Disaster and Climate Change (ECON 3071)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>ECON 3071</th>
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<tbody>
<tr>
<td>Course Title</td>
<td>The Economics of Disaster and Climate Change</td>
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<tr>
<td>Pre-, Co-requisites</td>
<td>ECON 3034 – Environmental Economics; and ECON 2020 – Caribbean Economy</td>
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<tr>
<td>Course Discipline/ Department</td>
<td>Economics</td>
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<tr>
<td>Units of Credit</td>
<td>Three (3)</td>
</tr>
<tr>
<td>Level and Semester of Offering</td>
<td>Level III, Semester II (2015/2016)</td>
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<tr>
<td>Lecture Time</td>
<td>Tuesdays 12-2pm (FSS 101 East)</td>
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<tr>
<td>Lecturer and Course Coordinator</td>
<td>Ms. Malini M. Maharaj (<a href="mailto:Malini.maharaj@sta.uwi.edu">Malini.maharaj@sta.uwi.edu</a>)</td>
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Course Description

This course is meant to enlighten students to the economic impacts of two major environmental threats facing Caribbean SIDS: Natural disasters and Climate Change. These threats unless fully assessed and managed, could affect the overall sustainable development of the region. This course intends to establish the specific relevance of Natural disasters and climate change to the region and highlights the links between the two.

From an economic perspective, this course surveys current Natural disaster Management issues—primarily methods that can be utilized to better manage and reduce the impacts of natural disasters in the region. The main topics explored are: economic vulnerability assessment, risk reduction, improving disaster preparedness and post-disaster recovery as well as the institutional frameworks necessary for the aforementioned.

An in-depth survey of the Economics of Climate Change issues is presented. Focus is placed on two (2) main sub-issues of Climate Change: the predicted socio-economic impacts of Climate Change particularly on SIDS and the various costs associated with mitigating carbon emissions and adapting to Climate change.

It satisfies the University’s and Department’s need to increase the consciousness of students to current issues that impact on the Caribbean, and that has paved and will continue to pave to a large extent the developmental path of Caribbean Economies. This course will explore an area that may
be interpreted as outside the scope of Social Sciences and establish a link with such “Natural” processes with Economic and Social implications.

**Purpose of the Course/Aims**

This course considers a number of facts including:

1. Increasing occurrence of natural disasters in the region a trend which is likely to be exacerbated given the projected impacts of climate change;

2. The large economic costs associated with these disasters with respect to key sectors of the economy: Tourism, Agriculture and Infrastructure;

3. The large predicted economic impacts of Climate change on the region both from the perspective of Adaptation costs as well as the costs of Mitigation;

4. The links between CO₂ emissions and anthropogenic activity; and

5. The importance building resilience and reducing risk of disadvantaged/vulnerable communities in the region for dealing with the above issues to ensure sustainable development

This course is designed for students interested in the economic impacts of Climate Change and Natural disasters as well as the use of economic policy instruments and sustainable development initiatives to reduce the future impacts of these environmental issues. This course aims to enable students to view these environmental issues through an economic lens by equipping students with the knowledge and tools presented by modern environmental economics adapted for the long term threat of Climate Change and the current worsening threat of Natural disasters especially in a Caribbean Context. Students will be exposed to various pieces of literature as well as important documents that have informed policy decisions on the subject matter of Natural Disasters and Climate change such that they themselves can make valued judgments on current issues and effectively participate in discourses and debates on the subject matter.

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<tr>
<th>Instructor Information</th>
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<tbody>
<tr>
<td><strong>Course Coordinator &amp; Lecturer</strong></td>
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<tr>
<td><strong>Instructor</strong></td>
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<tr>
<td><strong>Office Address and Phone</strong></td>
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</table>
Letter to the Student

Dear Students,

Welcome to The Economics of Disasters and Climate Change. We on the teaching team are eager about the opportunity to interact with you and share our knowledge and experiences over this semester.

We hope that the learning experience is a pleasant one, which will not only contribute to your overall academic endeavors but also your personal pursuits and professional careers.

If you have any questions or concerns please feel free to email any member of the teaching team or schedule an appointment during office hours.

We hope that you have a productive semester.

Best of Luck!
Sincerely,
The ECON 3071 Teaching Team.

General Objectives

1. To familiarize students with the concepts of disaster risk reduction and response and the essential events, critical issues and major discussions relating to the concept.

2. To explore a range of interpretations of disaster management in the context of the global environment, first and third worlds.

3. To review institutions, stakeholders and processes at various levels and evaluate the role of intergovernmental, governmental and non-governmental organizations with reference to disaster risk reduction and response.

4. To critically examine the principles, practice and policy of disaster risk reduction and disaster management at various levels.

5. Investigate through case studies and the application of conceptual frameworks the circumstances that give rise to disaster risk or disaster resilience.
6. To recognize good practice in interventions for disaster management and sustainable development.

Learning Outcomes
At the end of this course students should be able to:

1. Define, using examples, the key concepts underlying: Natural Hazards, Natural Disasters, Vulnerability and Climate Change.

2. Discuss the critical elements in determining the socio-economic impact of disasters at the micro and macro levels.

3. Critically evaluate the ideological interpretations, principles and practice of disaster risk reduction and response, from the local to the global levels.

4. Identify and explain the characteristics of institutions involved in disaster risk reduction and the response and policies for achieving disaster resilience.

5. Distinguish and economically justify the costs and benefits of adaptation vs mitigation strategies in climate change.

6. Appraise, using examples, good practice in interventions for disaster risk reduction and response to climate change.

Organization
This course is structured into 4 main parts as follows:

1. Introduction: Disasters their socio economic impact and the climate change link and how these may impact on Sustainable Economic Development
2. Economics of Climate change: Adaptation and Mitigation ;
3. Risk management and Mitigation of Natural disasters;
4. Conclusion.
Content of Course

1. Introduction

A. Introduction to Hazards, Disasters and Vulnerability
   (i) What are Natural Hazards, Natural disasters and Vulnerability: why Hazards do not = Disaster
   (ii) Vulnerability frameworks
   (iii) Disaster, Economic development and Sustainable Development

B. Economic aspects of key issues in disaster risk reduction
   (i) Sectoral impacts – tourism, agriculture, infrastructure
   (ii) Vulnerability and capacity of different social groups – poverty as an exacerbating factor
   (iii) Health – Psycho-social impacts of disaster
   (iv) Actions and strategies related to disaster stages

C. Macro and Micro economic impacts of disasters on Caribbean Islands.
   (i) The direct one off costs of disasters
   (ii) The indirect and long term costs

2. Climate change Adaptation and Mitigation

A. Expected impacts of Climate change on the Region
   (i) Physical impacts (sea-level rise etc)
   (ii) Economic Estimations and methods

B. Mitigation and its associated difficulties
   (i) What is mitigation and why is it important? 1.5°C vs. 2°C in temp
   (ii) Past efforts to curb emissions (Kyoto protocol), and their failings
   (i) Current efforts and the role of the developing regions in mitigation
   (ii) Introduction to the Kaya identity and the difficulty of reducing emissions.

C. Adaptation
   (i) Current adaptation science and practices
   (ii) Using Vulnerability and risk science to Guide adaptation

3. Managing Natural disasters

A. The importance of Risk management + Disaster Preparedness
   (i) Economic Policy Instruments for Disaster Risk Management
   (ii) Cost benefit of Risk management vs. Disaster response

B. Mitigating the effect of Natural disasters
   (iii) Economic and Social vulnerability indices and their use for risk management
C. The Economics of Mitigating Natural disasters + risk management
   (iv) Cost Benefit analysis for disaster risk mitigation prioritization
   (v) GIS and Land Use planning for disaster risk reduction

E. The Social and Political dimensions of natural disasters
   (i) Gender and Disasters in the Caribbean context - an economic perspective
   (ii) Institutional factors for disaster risk reduction - SIDS focus and Case studies

4. Conclusion

A. Adapting Natural disaster management tools for Climate Change
   (i) Successful risk reduction and disaster mitigation strategies. Case studies

Assignment

The course assignment is based on an internalization of the course literature and an application to case study analysis and practical research.

Course Assessment

1. In-course assessment of 35%

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<thead>
<tr>
<th>Assignment Type</th>
<th>Weighting</th>
<th>Details</th>
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<tbody>
<tr>
<td>Literature summaries</td>
<td>5%</td>
<td>Each student will be responsible for preparing and presenting summaries of various pieces of literature during the semester. Assessment criteria will be provided.</td>
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<tr>
<td>Tutorial Participation</td>
<td>5%</td>
<td>Each student will be responsible for preparing and presenting tutorial responses and engaging the rest of the class in discussions. Assessment criteria will be provided.</td>
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<tr>
<td>Practicum/ Research Project</td>
<td>25%</td>
<td>Students will be required to participate in a research project with the ODPM and prepare written submissions to contribute to this project.</td>
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2. A 65% final exam (2 Hours)

Evaluation

The course will be evaluated through either an online student evaluation (delivered on the myelearning course site) OR during one of the lecture sessions.
Teaching Strategies

- Teaching will primarily take place through descriptive face to face lecture sessions and class discussions. Online interactions will also complement these sessions.
- There will be guest lecturers from disaster risk management practitioners and/or researchers. Lectures will be conducted on Tuesdays from 12-2 pm. Lectures are complimented by one (1) hour of tutorials. Tutorial Sessions will facilitate discussions outside of the lectures, guided by a tutorial sheet.
- Make-up or additional lectures will be arranged in consultation with students.

Resources

Journals:
- Disasters;
- Journal of Environmental Management
- Climate Change
- Environmental Hazards
- Climate Policy

Core Texts and Readings:

2. Davis I., Bender, S., Krimgold F., and F. McDonald (2011): Reducing Disaster Risks Progress and Challenges in the Caribbean Region. Environmental Hazards Series ISBN 9781849713573

Supplementary texts and readings:

1. Introduction

A. Introduction to Hazards, Disasters and Vulnerability

(i). What are Hazards, disasters and Vulnerability. why Hazards do not = Disaster:


(ii) Vulnerability frameworks

2. Anderson, Mary B. Vulnerability to disaster and sustainable development: A general Framework for assessing Vulnerability
3. World Disasters Report - various years

B. Key issues in disaster risk reduction

(i) Health - Psycho social Impacts of disaster
(ii) Vulnerability and capacity of different social groups
C. Macro and Micro economic impacts of disasters on Caribbean Islands.

(i) The direct one off costs of disasters:


(ii) The indirect and long term costs:

1. Economics of Disaster risk Mitigation in the Caribbean, World Disasters Report.

(ii) Disasters and Economic development:

2. *UNDP-Reducing disaster risk a challenge for development (section 1)*

2. Climate change Adaptation and Mitigation
A. Introduction and Expected impacts of Climate change on the Region

(i). Physical Impacts


(ii). Economic Estimation and methods

1. Climate Change, The Physical Science Basis, IPCC. Available at: [http://ipcc-wg1.ucar.edu/wg1/](http://ipcc-wg1.ucar.edu/wg1/)
2. ECLAC (2010): Economics of Climate Change in Latin America and the Caribbean.
Summary 2010. UNECLAC.

B. Mitigation and its associated difficulties
(i). What is mitigation and why is it important? 1.5 vs 2C in temp

C. Adaptation
(i). Current adaptation science and practices
(ii)Using Vulnerability and risk science to Guide adaptation

3. Managing Natural disasters
A. The importance of Risk management + Disaster Preparedness
   (i). Cost benefit of Risk management vs Disaster response
      1. Report on Economics of Disaster risk Mitigation in the Caribbean (section 4).

B. Mitigating the effect of Natural disasters
   (ii). Vulnerability indices, and their use for risk management
      Joern Birkmann ( ): Risk and vulnerability indicators at different scales: Applicability, 1. Usefulness and policy implications.

C. The Economics of Mitigating Natural disasters + risk management
   i. Cost Benefit analysis for disaster risk mitigation prioritization.
   ii. Economic development and Risk reduction.
   iv. GIS and mitigation?

D. The Social aspect of natural disasters
(i). Gender and Disasters in the Caribbean context, an economic perspective

(ii). Institutional factors for disaster risk reduction, SIDS focus + Case studies
   2. Attzs, Marlene (2008): Natural disasters and Remittances; Exploring the Linkages between Poverty, Gender and Disaster Vulnerability in Caribbean SIDS.

4. Conclusion
(i) Successful risk reduction and disaster mitigation strategies: Case studies.

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Course Calendar

<table>
<thead>
<tr>
<th>Teaching Week</th>
<th>Unit/Content</th>
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<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td><strong>Introduction</strong></td>
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<tr>
<td></td>
<td>A. Introduction to Hazards, Disasters and Vulnerability:</td>
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<tr>
<td></td>
<td>i. What are Natural Hazards, Natural disasters and Vulnerability: why Hazards do not = Disaster</td>
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<td></td>
<td>ii. Vulnerability frameworks</td>
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<td></td>
<td>iii. Disaster, Economic development and Sustainable Development</td>
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<tr>
<td><strong>Week 2</strong></td>
<td>B. Economic aspects of key issues in disaster risk reduction:</td>
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<tr>
<td></td>
<td>i. Sectoral impacts – tourism, agriculture, infrastructure</td>
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<td>ii. Vulnerability and capacity of different social groups – poverty as an exacerbating factor</td>
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<td>iii. Health - Psycho social Impacts of disaster</td>
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<td>iv. Actions and strategies related to disaster stages</td>
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<tr>
<td><strong>Week 3</strong></td>
<td>C. Macro and Micro economic impacts of disasters on Caribbean Islands:</td>
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<tr>
<td></td>
<td>i. The direct one off costs of disasters</td>
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<td></td>
<td>ii. The indirect and long term costs</td>
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<tr>
<td><strong>Week 4</strong></td>
<td>Climate change Adaptation and Mitigation</td>
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<tr>
<td></td>
<td>A. Expected impacts of Climate change on the Region:</td>
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<tr>
<td></td>
<td>i. Physical impacts (sea-level rise etc)</td>
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<td></td>
<td>ii. Economic Estimations and methods</td>
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<td><strong>Week 5</strong></td>
<td>B. Mitigation and its associated difficulties:</td>
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<td></td>
<td>i. What is mitigation and why is it important? 1.5o vs. 2oC in temp</td>
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<td>ii. Past efforts to curb emissions (Kyoto protocol), and their failings</td>
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<td>iii. Current efforts and the role of the developing regions in mitigation</td>
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<td>iv. Introduction to the Kaya identity and the difficulty of reducing emissions.</td>
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<td><strong>Week 6</strong></td>
<td>C. Adaptation:</td>
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<tr>
<td></td>
<td>i. Current adaptation science and practices</td>
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<td>ii. Using Vulnerability and risk science to Guide adaptation</td>
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<tr>
<td><strong>Week 7</strong></td>
<td>Managing Natural Disasters</td>
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<td></td>
<td>A. The importance of Risk management + Disaster Preparedness:</td>
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<tr>
<td></td>
<td>i. Economic Policy Instruments for Disaster Risk Management</td>
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<td></td>
<td>ii. Cost benefit of Risk management vs. Disaster response</td>
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<td><strong>Week 8</strong></td>
<td>B. Mitigating the effect of Natural disasters:</td>
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<tr>
<td></td>
<td>i. Economic and Social vulnerability indices and their use for risk management</td>
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<tr>
<td><strong>Week 9</strong></td>
<td>C. The Economics of Mitigating Natural disasters + risk management:</td>
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<tr>
<td></td>
<td>i. Cost Benefit analysis for disaster risk mitigation prioritisation</td>
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<tr>
<td></td>
<td>ii. GIS and Land Use planning for disaster risk reduction</td>
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<tr>
<td><strong>Week 10</strong></td>
<td>E. The Social and Political dimensions of natural disasters:</td>
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<td></td>
<td>i. Gender and Disasters in the Caribbean context - an economic perspective</td>
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<td></td>
<td>ii. Institutional factors for disaster risk reduction - SIDS focus and Case studies</td>
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<tr>
<td><strong>Week 11</strong></td>
<td>Conclusion</td>
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<td></td>
<td>A. Adapting Natural disaster management tools for Climate Change:</td>
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<tr>
<td></td>
<td>i. Successful risk reduction and disaster mitigation strategies. Case studies</td>
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<tr>
<td><strong>Week 12</strong></td>
<td>Recap of Lectures and Presentation of Assignments</td>
</tr>
</tbody>
</table>
1. Students are reminded of **UWI Examination regulation no. 78** which states, inter alia,
   - 78. (i) Cheating shall constitute a major offence under these regulations.
   - (ii) Cheating is any attempt to benefit one’s self or another by deceit or fraud.
   - (iii) Plagiarism is a form of cheating.
   - (iv) Plagiarism is the unauthorised and/or unacknowledged use of another person’s intellectual efforts and creations howsoever recorded, including whether formally published or in manuscript or in typescript or other printed or electronically presented form and includes taking passages, ideas or structures from another work or author without proper and unequivocal attribution of such source(s), using the conventions for attributions or citing used in this University.

**UWI Examination Regulation No. 19** “Any candidate who has been absent from the University for a prolonged period during the teaching of a particular course for any reason other than illness or whose attendance at prescribed lectures, classes, ... tutorials, ... has been unsatisfactory or who has failed to submit essays or other exercises set by his/her teachers, may be debarred by the relevant Academic Board, on the recommendation of the relevant Faculty Board, from taking any University examinations. The procedures to be used shall be prescribed in Faculty Regulations.”

In this connection, the Faculty of Social Sciences requires **students to attend and participate in at least 75% of tutorials.**

2. Students are reminded of UWI Examination regulation no. 78 which states, inter alia,
   - 78. (i) Cheating shall constitute a major offence under these regulations.
   - (ii) Cheating is any attempt to benefit one’s self or another by deceit or fraud.
   - (iii) Plagiarism is a form of cheating.
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   **In addition to the above,** Students are reminded that deliberate collaborations during the completion of any University Examination inclusive of online quizzes regardless of location will also constitute cheating and will be penalized accordingly.
How to Study for this Course

All material is examinable for this course. As such students should READ thoroughly all recommended literature and also expand their knowledge through additional readings. Tutorial sessions should facilitate further learning so long as students are prepared to discuss the tutorial questions. Students should also use research as a means of obtaining relevant and current course content.

Marking Scheme for Examinations in the Faculty of Social Sciences

21. (i) In the determination of GPA, the grades with corresponding quality points shall be as defined in the University Regulations governing the GPA.

The authorized marking scheme as of Academic Year 2014/2015 is as follows:

<table>
<thead>
<tr>
<th>Grade</th>
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<th>Grade Point</th>
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<tbody>
<tr>
<td>A+</td>
<td>90-100</td>
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<tr>
<td>A</td>
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<td>4</td>
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<tr>
<td>A-</td>
<td>75-79</td>
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<tr>
<td>B+</td>
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Department of Economics
January 2016