### Seminar: Sustainable Growth

Topics and teasers (SS 2019)

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<th>Teasers &amp; Literature</th>
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| 1 | **Beyond GDP: Alternative Metrics for Economic Growth and Prosperity**  
Commonly, economic growth and prosperity is measured by the growth rate of the economy’s gross domestic product (GDP). While GDP growth accounts for the development of the availability of goods and services, it disregards other important factors such as, for instance, the sustainability of the growth process and its environmental impact, employment opportunity, economic equality and security, and quality of life. In response to this neglect, ambitious institutional efforts have brought about a variety of alternative, broader metrics of economic prosperity such (among others) the system of metrics proposed by the Office for National Statistics in the UK and the Commission on the Measurement of Economic Performance and Social Progress, the World Economic Forum’s Inclusive Development Index (IDI), and Gross National Happiness (GNH) index of the Kingdom of Bhutan. Against this background, this seminar topic discusses the arguments put forth for failure of GDP as an appropriate measure for economic growth and prosperity and critically assess (one or more) alternative proposal(s).  
(Review Paper) BA |
| 2 | **Money Buys Happiness, Doesn’t it?**  
Rich people tend to be happier than poor people, and rich countries tend to be happier than poor countries. Yet, increasing incomes (i.e. economic growth) not necessarily translates into increasing happiness. This puzzling phenomenon of a short term correlation of income and happiness despite the absence of the analogous long-term correlation is commonly known as the Easterlin paradox; named after Richard Easterlin who first documented this phenomenon in 1974. Ever since its discovery, the Easterlin paradox has led to fiercely fought discussion about the measurement of happiness in economics (at the individual level and at the aggregate) and its relationship to macroeconomic developments. Against this background, the seminar paper revisits the Easterlin paradox, reviews the current state of the debate in the literature, and – guided by this – analyzes the relationship between happiness and economic growth.  
(Review Paper) BA |
| 3 | **What is economic growth? How to measure it?**  
How do we measure growth of real production and productivity? The standard critique on GDP measures is that it neglect products and efforts that are not traded on markets. This seminar presentation should go beyond and explain problems with measuring growth and productivity within the world of traded goods. Why do we perceive it as a puzzle that productivity measures seem to be irresponsive to the introduction of the new information and communication technologies? What are the potential explanations/ how can this puzzle be solved? How is it related to measures of R&D?  
(Review Paper) BA |
| 4 | **Modelling economic growth – learning by doing**  
Undoubtedly, innovation is one of the key factors driving growth. Therefore, developing a framework in which technological progress emerges endogenously from decisions made within the model rather than by assumption is a crucial part of explaining growth.  
The concept of learning by doing was one of the first ways to model technological change. The intuition behind this approach is that new ideas are unintended byproducts of production or investment. These models assume that new ideas instantaneously spill over into the whole economy.  
The seminar paper should follow the requirements for a “focus paper”.  
(Focus paper) MA |
| 5 | **Modelling economic growth – Romer (technology)**  
This paper should explain Paul Romer’s extension of the standard growth model. It includes investment in human capital and accounts for knowledge being a public good. For this contribution Paul Romer was awarded the 2018 Nobel Memorial Prize in Economic Science.  
(Focus paper) MA |
Modelling economic growth – Directed technological change
Undoubtedly, innovation is one of the key factors driving growth. Therefore, developing a framework in which technological progress emerges endogenously from decisions made within the model rather than by assumption is a crucial part of explaining growth.

Technological change which is endogenous to the market responds to changes in relative factor prices. This implies that government policies can support the transition to a sustainable economy by providing incentives to invest in clean technologies. This seminar paper will show how this relationship can be used to tackle the problem of climate change in macroeconomic models. Under which conditions does this “directed” technological change facilitate sustainable economic development?

(Model Paper) MA

Modeling technological change – Creative destruction
Undoubtedly, innovation is one of the key factors driving growth. Therefore, developing a framework in which technological progress emerges endogenously from decisions made within the model rather than by assumption is a crucial part of explaining growth.

This seminar paper should analyze the concept of Schumpeterian Growth which is based on the idea of creative destruction. Creative destruction describes the process of new innovations replacing old technologies. How can this be modelled and what are the predictions of this kind of technological progress?

(Review Paper) MA

Modelling economic growth: Environmental sustainability in an Overlapping Generations (OLG) model
Overlapping Generation models constitute a simple and yet powerful framework to model long-run macroeconomic developments. In contrast to other growth models, agents in the OLG model have a finite-lifetime which overlaps with previous and the future generation. The goal of this seminar paper is to show and critically evaluate how economic growth and sustainability aspects can be captured and analyzed in OLG models on the example of one focus paper.

(Focus Paper) MA

Secular Stagnation
Secular (= long term) stagnation describes a situation in which economies are incapable of creating enough demand to sustain growth and full employment. Too little aggregate demand is a consequence of households not spending enough and firms not investing enough even at very low or zero interest rates. The seminar paper should present the different arguments proposed in the literature as well as highlight and assess opposing views on the topic.

(Review Paper) BA

Secular Stagnation & negative (real) interest rates
A formal overlapping generations (OLG) model in which households go through three stages in life: young, middle aged and old. As income is largely concentrated in the middle generation, the middle aged lend to the young to save for when they are old. Additionally, the young generation can only borrow up to some exogenous debt limit. The authors show that a tightening of the debt limit together with slowed population growth and an increase in income inequality can lead to periods of secular stagnation and negative real interest rates. The seminar paper should follow the requirements for a “focus paper”.

(Focus paper) MA

Demography and economic growth: How do demographic developments affect long-run economic growth and sustainability?
Overall, the world population is rapidly growing and is projected to reach more than 8.5 billion by 2030. However, population developments are very heterogeneous. While especially many industrialized countries face population stagnation or even decline and an aging population, most developing countries exhibit high population growth and a very young population. The goal of the seminar paper is to give an overview in which ways demographic factors and developments affect economic growth and sustainability. This may include looking at demographic developments in connection to automation, robotization, employment, inequality, ecology and climate change.

(Review Paper) BA

Limits to economic growth
What are the limits to growth? The Club of Rome predicted the end of growth due to a lack of resources in the early 21st century. They neglected technological progress and how it helped us to reach resources that were out of reach 50 years ago. Yet, extraction of mineral resources becomes ever more difficult and there are limits to the known resources of some minerals that cannot be replaced yet. In addition, other restrictions might limit growth. Do limited natural resources and pollution put limits to growth or will technology make up for the lack of resources? This topic studies whether economic growth and life quality can be maintained in an environment with limited natural resources.

(Review Paper) BA
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<td>13</td>
<td>The Hotelling rule revisited – How does the Hotelling rule help us to understand the price of non-renewable resources today?</td>
<td>The Hotelling (1931) rule formed the theoretical core of the economics of non-renewable resources by presenting a theory of resource pricing based on the insight that resource owners should treat their holdings as assets. At its core is the reasoning that the resource price is equal to the scarcity rent, which must rise at the rate of interest. Even though it has largely been shown that the Hotelling rule does not hold empirically, it continues to remain relevant, especially in economic modelling, because of its normative character. The goal of the seminar paper is to critically review the theory of the Hotelling rule, how it contributes to understanding the economics of non-renewable resources and give an overview of alternative explanatory approaches. (Review Paper) BA</td>
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<td>14</td>
<td>Circular economy as concept of the future?</td>
<td>A circular economy provides a potential way to increase prosperity, while reducing dependence on primary materials and energy. The goal is to “close the loop” of product lifecycles: from production and consumption to waste management and the market for secondary raw materials (EU, 2019). The seminar paper should focus on this kind of “green growth” by analyzing the relevant economic literature. What are the crucial conditions under which a circular economy could provide sustainable growth? (Review Paper) BA</td>
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<td>15</td>
<td>Zero Growth For All: Post-Growth Movements In Economics</td>
<td>The post-growth movement (such as, for instance, Postwachstumsökonomie, Steady State Economics, Degrowth) propagates an economic model of (close to) zero growth. The necessity for such a radical future economic model is derived mostly from the finite availability of resources and space and calls for substantial changes in economic behavior, both, at the individual and at the aggregate level. The post-growth movement sees itself as an ecological sub-discipline of economics, yet, it distinguishes itself explicitly from its mainstream equivalent Environmental Economics. This seminar paper compares the economics of post-growth movements to the traditional approach from mainstream Environmental Economics. To do so, the seminar paper reviews the main arguments of the post-growth movements and evaluates them through the lens of mainstream economic theory (Review Paper) BA</td>
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<td>16</td>
<td>Modelling economic growth: Considering climate in economic modelling – The DICE model</td>
<td>William Nordhaus was awarded the Nobel Prize in Economics 2018 for “integrating climate change into long-run macroeconomic analysis. He accomplished this by developing the so called “Dynamic Integrated model of Climate and the Economy” (DICE) model. The model has become very influential to academics and policy makers alike. Therefore, the goal of the seminar paper is to critically review the original DICE model by Nordhaus. (Focus paper) MA</td>
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<td>17</td>
<td>The cost of climate change – Stern Review</td>
<td>Historically, economic growth usually went hand in hand with heavier use of natural resources and thereby increased greenhouse gas (GHG) emissions. As the cost of GHG emission for the society as a whole are assumed to be much higher than for the single emitter climate change constitutes the biggest market failure the world has ever seen. The Stern Review is an extensive study, which tries to quantify the actual cost of GHG emissions and climate change. The seminar paper should critically assess the methodology and results of this study. (Focus paper) BA or MA</td>
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<td>18</td>
<td>Modelling economic growth – Discounting the future</td>
<td>Climate change is a long-term problem meaning that our decisions today will affect future generations. However, the evaluation of this future is based on subjective, and somehow arbitrary, discount rates. In economics, agents need to undertake “dynamic optimization” to maximize the discounted expected utility of lifetime consumption. Assuming different discount rates results in drastically different policy recommendations. This seminar paper should analyze why this is the case and discuss different arguments for assuming high vs. low discount rates. (Review Paper) BA</td>
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<td>19</td>
<td>Automation, artificial intelligence and economic growth</td>
<td>What are the implications of automation and artificial intelligence (A.I.) on economic growth and how will this affect the division of income between labor and capital? The seminar paper should provide an answer to this question by discussing different approaches how the economic literature deals with this latest form of “automation”. Some experts argue that A.I. will change the process by which we create new ideas and technologies in an unprecedented way. Can this lead to unbounded machine intelligence (“economic singularity”) and hence, to unbounded economic growth in finite time? (Review Paper) MA</td>
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Increasing digitalization, automation and the rise of artificial intelligence will drastically change the way we live and work. New concepts for distributing the gains of these developments are discussed in the academic debate. One idea is an unconditional basic income (UBI) which promotes the decoupling of income from work. This seminar paper should critically discuss the pros and cons of UBI in the light of a changing economy. What does economic theory tell us about this concept and can it be successful?

(Review Paper) BA

One fundamental result of Thomas Piketty’s bestselling book “Capital in the 21st Century” is that rising inequality is a direct and inevitable result of declining growth rates. The seminar paper should critically assess this statement and survey the recent literature on the links between growth and (within + between country) inequality.

(Review Paper) BA or MA

This paper should inform us about historical evidence of international coordination that may be relevant for future coordination, e.g. regarding the control of climate change. How was the ban on CFCs (Fluorchlorkohlenwasserstoffe, FCKW) achieved? Why could sulfur emissions be controlled effectively, while CO2 is not?

(Review Paper) MA

International coordination may be particularly important for sustainable growth. Is it useful for a country to voluntarily reduce its carbon dioxide emissions if the neighbor continues to pollute? Because natural resources are scarce and air quality is used as a public good, the economic incentives to free ride on the efforts of other countries are very strong. This topic will look from a game theoretic point of view on whether it is possible to create a structure of incentives that leads to an efficient international coordination.

(Focus Paper) BA

The rise of behavioral economics has gone hand in hand with the study of “nudges” or as some refer to it: choice architecture. Can policy makers steer the way people make choices in a non-invasive way? If they can, what are the tools? Is this ethical? What are the potential benefits and problems of shaping peoples’ preferences for the greater good of the environment? The goal of the seminal paper is to explore the role of behavioral economics in designing economic policy and changing consumer behavior into a more sustainable direction.

(Review Paper) MA

During the past years, the sharing economy sector has experienced rapid growth. Players like Airbnb and Uber emerged from this development. This new form of “collaborative” consumption can be characterized by accessing rather than owning a product. What can we expect from this form of economic activity? Will it help to reduce the fast depletion of natural resources? Can it generate positive economic, social and environmental effects that helps to achieve sustainability goals?

(Review Paper) BA

There are many ways how to design environmental policy; ranging from taxes, quotas and subsidies to compensation schemes and performance standards. The first goal of this seminar paper is to give an overview the spectrum of environmental policy instruments. As it has become evident on the infamous example of the EU Emission Trading Scheme, not all policies have the same effectiveness. Therefore, in a second step, the seminar paper should critically review and compare the effectiveness of a set of selected environmental policy measures.

(Review Paper) MA