### **Mathematical Economics Lecture Notes**

Lecture Notes in Microeconomic TheoryLecture Notes In Urban Economics And Urban PolicyLecture Notes on Resource and Environmental EconomicsLecture Notes In International Trade: An Undergraduate CourseInteraction and Market StructureLecture Notes On International Trade Theory And PolicyFiscal Policy, Public Debt and the Term Structure of Interest RatesLecture Notes In International Trade Theory: Classical Trade And ApplicationsStandardization and ExpectationsLecture Notes In Experimental EconomicsEconometric Models For Industrial OrganizationScience Of Mistakes, The: Lecture Notes On Economic Data EngineeringFundamentals of Production TheoryAffective Decision Making Under UncertaintyJacob VinerInput-Output Analysis and the Structure of Income DistributionQuantitative Models for Reverse LogisticsEngineering Economics: Decisions and Solutions from Eurasian PerspectiveInterest Rate Dynamics, Derivatives Pricing, and Risk ManagementLecture Notes In Water PolicyResource and Environmental EconomicsLecture Notes In Public Budgeting And Financial ManagementPolitical Economy for Public PolicyA Dynamic Approach to Economic TheoryIntroduction to the Theory of Economic GrowthLecture Notes In State And Local Public Finance (Parts I And Ii)The Principles Of Economics, With Applications To Practical ProblemsDynamic Stochastic OptimizationLectures In The Microeconomics Of Choice: Foundations, Consumers, And ProducersLecture Notes on Types of Economic TheoryEconomics, Game Theory And International Environmental Agreements: The Ca' Foscari LecturesLecture Notes In Global-local Policy InteractionsLectures on Urban EconomicsRational HerdsThe EconomyLecture Notes In Market Microstructure And TradingLectures On Probability And Statistics For Graduate-level EconomicsIntermediate MicroeconomicsNonlinear Dynamical Economics and Chaotic MotionLionel Robbins on the Principles of Economic Analysis Ariel Rubinstein John Yinger Anthony C. Fisher Privaranjan Jha Domenico Delli Gatti Richard Pomfret Roland Demmel Larry S Karp Tobias Langenberg John Duffy Matthew Shum Andrew Caplin Rolf Färe Donald J. Brown Douglas A. Irwin K. Miyazawa Moritz Fleischmann Svetlana Igorevna Ashmarina Lin Chen David L Feldman Anthony C. Fisher William Duncombe Ethan Bueno de Mesquita Ragnar Frisch R. Ramanathan John Yinger Frank Albert Fetter Kurt Marti William David Anthony Bryant Wesley Clair Mitchell Henry Tulkens Ariel Dinar Jan K. Brueckner Christophe Chamley Core Team Peter Joakim Westerholm Antonio Jimenez-martinez Walter Nicholson Hans-Walter Lorenz Lionel Robbins

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ariel rubinstein s well known lecture notes on microeconomics now fully revised and expanded this book presents ariel rubinstein s lecture notes for the first part of his well known graduate course in microeconomics developed during the fifteen years that rubinstein taught the course at tel aviv university princeton university and new york university these notes provide a critical assessment of models of rational economic agents and are an invaluable supplement to any primary textbook in microeconomic theory in this fully revised and expanded second edition rubinstein retains the striking originality and deep simplicity that characterize his famously engaging style of teaching he presents these lecture notes with a precision that gets to the core of the material and he places special emphasis on the interpretation of key concepts rubinstein brings this concise book thoroughly up to date covering topics like modern choice theory and including dozens of original new problems written by one of the world's most respected and provocative economic theorists this second edition of lecture notes in microeconomic theory is essential reading for students teachers and research economists fully revised expanded and updated retains the engaging style and method of rubinstein s well known lectures covers topics like modern choice theory features numerous original new problems including 21 new review problems solutions manual available only to teachers can be found at gametheory tau ac il microtheory

lecture notes in urban economics and urban policy provides a wide ranging introduction to urban economics and urban policy by professor john yinger one of the world s leading scholars in urban economics it draws on his extensive teaching and publication record to provide detailed lecture notes for both a phd level course in urban economics and a master s level course in urban policy both the us and the world populations are becoming more and more urbanized and these notes are designed to help scholars learn and teach about the factors that determine urban residential structure and that lead to urban problems such as inadequate housing concentrated poverty an inequitable distribution of local public services racial and ethnic discrimination in housing and traffic congestion although these notes focus on the us many of

the lessons in the notes apply to other countries as well they also draw on professor yinger s extensive teaching experience and publication record in urban economics and should prove useful to many scholars who want to teach about or study urban areas

this book based on lectures on natural and environmental resource economics offers a nontechnical exposition of the modern theory of sustainability in the presence of resource scarcity it applies an alternative take on environmental economics focusing on the economics of the natural environment including development computation and potential empirical importance of the concept of option value as opposed to the standard treatment of the economics of pollution control the approach throughout is primarily conceptual and theoretical though empirical estimation and results are sometimes noted mathematics ranging from elementary calculus to more formal dynamic optimization is used especially in the early chapters on the optimal management of exhaustible and renewable resources but results are always given an economics interpretation diagrams and numerical examples are also used extensively the first chapter introduces the classical economists as the first resource economists in their discussion of the implications of a limited natural resource base agricultural land for the evolution of the wider economy a later chapter returns to the same concerns along with others stimulated by the energy and environmental crises of the 1970s and beyond one section considers alternative measures of resource scarcity and empirical findings on their behavior over time another introduces the modern concept of sustainability with an intuitive development of the analytics a chapter on the dynamics of environmental management motivates the concept of option value shows how to compute it then demonstrates its importance in an illustrative empirical example the closing chapter on climate change first projects future changes and potential catastrophic impacts then discusses the policy relevance of both option value and discounting for the very long run this book is intended for resource and environmental economists and can be read by interested graduate and advanced undergraduate students in the field as well

this book provides a comprehensive discussion of the economics of international trade key questions related to why countries trade how they gain from trade and how international trade can produce winners and losers are answered the last of these questions is related to the connection of trade to inequality in the distribution of income the book uses both theoretical models and empirical evidence to answer these questions it also provides a discussion of the economics of labor migration and international capital mobility the book also provides a detailed discussion of the welfare implications of various trade policy instruments such as tariffs quotas export subsidies etc this is followed by a discussion of the process of actual policymaking in democratic societies which goes into the realm of political economy the focus here is on the political economy of trade policy it also provides a discussion of the economics of preferential trading agreements and a history of multilateral trading agreements under the aegis of gatt general agreement on tariffs and trade and its evolution into the world trade organization wto

this book is a collection of essays which examine how the properties of aggregate variables are influenced by the actions and interactions of heterogenous individuals in different economic contexts the common denominator of the essays is a critique of the representative agent hypothesis if this hypothesis were correct the behaviour of the aggregate variable would simply be the reproduction of individual optimising behaviour in the methodology of the hard sciences one of the achievements of the

quantum revolution has been the rebuttal of the notion that aggregate behaviour can be explained on the basis of the behaviour of a single unit the elementary particle does not even exist as a single entity but as a network a system of interacting units in this book new tracks in economics which parallel the developments in physics mentioned above are explored the essays in fact are contributions to the analysis of the economy as a complex evolving system of interacting agents

this book provides a comprehensive review of the theory of international trade and trade policy including coverage of recent areas of research such as heterogeneous firm trade models and trade costs it then proceeds to analyze the history of trade policies and the evolution of the global trading system with a primary focus on important policies or controversial issues such as the doha round antidumping duties regionalism and fair trade it aims to emphasize the significance of different theories and how they are interconnected unlike other technique driven international economics textbooks this book focuses on readers understanding how theory and policy are connected written in a lecture note format and in a straightforward manner the presentation is self contained with no assumed mathematical knowledge

the introduction of the thesis consists of four parts first we motivate our chosen macroeconomic setting by looking at some real world phenomena for a better understanding of these phenomena we argue that the mutual dynamic interactions between flscal policy and financial markets need to be closely examined in a macroeconomic framework second we review different strands of the economic literature in order to show that most of the literature has so far exclusively concentrated either on fmancial market dynamics or on flscal policy issues we conclude that a more integrated model setting is called for in order to explain the dynamic interactions observed in reality third we discuss at length the economic assumptions underlying our model this avoids multiple repetition later on finally we outline the structure of the thesis and the objectives we pursue in the different chapters 1 1 motivation fiscal policy and financial market reactions are increasingly receiving world wide attention the most recent examples are the maastricht criteria about flscal control the south east asia financial crisis and the resulting imf policy stance the high level of public debt in developed and developing countries and the effect on interest rates and economic growth in contrast to the still underdeveloped theoretical literature on these dynamic links finding empirical evidence that supports the existence of these links is not a very hard task

lecture notes in international trade theory covers classical international trade models including the ricardian ricardo viner and heckscher ohlin samuelson models the course is designed for m sc and first year phd students it relies on both graphical and analytic methods requiring only intermediate microeconomics and a solid grounding in calculus the material emphasizes second best settings where markets are imperfect the goal is to equip students with a good enough understanding of open economy general equilibrium relations that they understand how distortions ripple across different markets e g commodity and factor markets the author applies these ideas to environmental and natural resource problems including pollution leakage where pollution reductions in one country are offset by trading partners increased pollution and imperfect property rights other applications include the general equilibrium effects of commodity and trade taxes international transfers the transfer problem minimum wage constraints and immiserizing growth the author assumes that students have some experience in formulating and answering comparative statics questions in an optimization setting building on these skills and developing the idea of stability in an equilibrium setting the marshall lerner condition

students learn how to formulate and answer comparative static questions in trade models

over the last decades technological progress has brought about a multitude of standardization problems for instance compatibility standards ensure the interoperability of goods which is of decisive importance when users face positive externalities in consumption consumers expectations are key to the problem of whether a new technology will prevail as de facto standard or not early adopters must be confident that the network good will be successful thus it may be worthwhile for firms to influence consumers expectations consisting of three models on various aspects of standardization and expectations this book aims at deepening our understanding of how standards and expectations interact the models are applied to problems such as inter technology vs intra technology competition and standardization of nascent technologies

experimental economics involves the use of controlled experimental methods both in the laboratory and the field to better comprehend how individuals and groups make economic decisions and to more clearly identify causal relationships this book takes the reader to the frontier of research in this exciting and rapidly growing field unlike other texts this book discusses both the methodology of experimental economics and some of the main application areas the material is organized as a series of 12 chapters or lectures that can be covered in a single academic term the first five chapters cover the reasons for experimentation as well as basic experimental methodology the last seven chapters discuss applications of experimental economics to areas such as game theory public economics social preferences auctions and markets the book assumes only a basic knowledge of economics and game theory and is written at a level that is suitable for advanced undergraduate master s or phd students

economic models for industrial organization focuses on the specification and estimation of econometric models for research in industrial organization in recent decades empirical work in industrial organization has moved towards dynamic and equilibrium models involving econometric methods which have features distinct from those used in other areas of applied economics these lecture notes aimed for a first or second year phd course motivate and explain these econometric methods starting from simple models and building to models with the complexity observed in typical research papers the covered topics include discrete choice demand analysis models of dynamic behavior and dynamic games multiple equilibria in entry games and partial identification and auction models

that mistakes are made is clear what is meant by that is not measuring whatever might be meant and scientifically studying it is therefore even more challenging these lectures introduce an interdisciplinary science of mistakes to cut the gordian knot the key building blocks are model constructs drawn from the economic tradition methods of measurement drawn from the psychometric tradition and analytic methods drawn from economic theory

this graduate text develops production theory from a set of reasonable axioms the theory is presented both in a primal and dual as well as in an indirect constrained framework the basic model leads to a set of efficiency measures which can be readily employed in empirical work a first draft of the text was used to teach students at

vanderbilt university the text includes a variety of exercise problems

this book is an exploration of the ubiquity of ambiguity in decision making under uncertainty it presents various essays on behavioral economics and behavioral finance that draw on the theory of black swans taleb 2010 which argues for a distinction between unprecedented events in our past and unpredictable events in our future the defining property of black swan random events is that they are unpredictable i e highly unlikely random events in this text mandelbrot s 1972 operational definition of risky random unpredictable events is extended to black swan assets assets for which the cumulative probability distribution or conditional probability distribution of random future asset returns is a power distribution ambiguous assets are assets for which the uncertainties of future returns are not risks consequently there are two disjoint classes of black swan assets risky black swan assets and ambiguous black swan assets a new class of ambiguous assets with unpredictable random future outcomes the text is divided into two parts the first of which focuses on affective moods introduces affective utility functions and discusses the ambiguity of black swans the second part which shifts the spotlight to affective equilibrium in asset markets features chapters on affective portfolio analysis and walrasian and gorman polar form equilibrium inequalities in order to gain the most from the book readers should have completed the standard introductory graduate courses on microeconomics behavioral finance and convex optimization the book is intended for advanced undergraduates graduate students and post docs specializing in economic theory experimental economics finance mathematics computer science or data analysis

this book presents for the first time a detailed transcription of jacob viner s economics 301 class as taught in 1930 these lecture notes provide insight into the legacy of jacob viner whose seminal contributions to fields such as international economics and the history of economics are well known but whose impact in sparking the revival of marshallian microeconomics in the united states via his classroom teaching has been less appreciated generations of graduate students at the university of chicago have taken economics 301 the course has been taught by such luminaries as milton friedman and gary becker and remains an introduction to the analytical tools of microeconomics and the distinctive chicago way of thinking about the market system this demanding and rigorous course first became famous in the 1930s when it was taught by jacob viner when read in tandem with the transaction editions of milton friedman s price theory frank knight s the economic organization and gary becker s economic theory viner s lectures provide the reader with important insights into the formative period of chicago price theory these recently discovered notes from viner s class will be important for historians of economic thought and anyone interested in the origins of the chicago school of economics

the purpose of this study is in keeping with the shift in concern over the eco nomic problems of growth to those of income distribution in recent years income distribution problems may be analyzed by not only the traditional procedures but also by some extensions of the input output technique as i shall demonstrate in this volume of the lecture notes some fruitful results are obtained by applying the extended input output technique to income analysis as well as to output analysis this volume consists of three parts these parts may be viewed along two veins with some overlapping unavoidable 1 parts one and two contain extensions of the input output analysis and 2 parts one and three contain studies of the effects of the structure of income distribution on some other economic relationships first as an extension of the input output analysis we present a synthesis of the leontief interindustry matrix multiplier and the keynesian income multiplier in disaggregated form and introduce a new concept which may be called the interrela tional income multiplier as a matrix it is designed to analyze the interrelation ships among various income groups in the process of income formation through the medium of industrial production activity although this multi sector multiplier follows from leontief s interindustry matrix multiplier it is formulated by the inclusion of the income generation process which is omitted in the usual input output open model and by projecting the multiplier process into not only the output determination side but also into the income determination side

economic marketing and legislative considerations are increasingly leading companies to take back and recover their products after use from a logistics perspective these initiatives give rise to new goods flows from the user back to the producer the management of these goods flows opposite to the traditional supply chain flows is addressed in the recently emerged field of reverse logistics this monograph considers quantitative models that support decision making in reverse logistics to this end several recent case studies are reviewed moreover first hand insight from a study on used electronic equipment is reported on on this basis logistics issues arising in the management of reverse goods flows are identified moreover differences between reverse logistics and more traditional logistics contexts are highlighted finally attention is paid to capturing the characteristics of reverse logistics in appropriate quantitative models

this book presents the outcomes of the annual engineering economics week 2020 organized by the russian union of industrialists and entrepreneurs the institute of management and the institute of market problems of the russian academy of sciences ras the south russian state polytechnic university and samara state university of economics and held in online format in may 2020 focusing on the following topics the globalized economy and russian industrial enterprises development specifics and international co operation state support for the real sector of the economy decisions in production and project management in the context of the digital economy big data and big challenges in production networks and systems and economic and social aspects of the innovation management decision making and control this book will appeal to scientists teachers and students bachelor s master s and postgraduate at higher education institutions economists specialists at research centers managers of industrial enterprises business professionals and those at media centers and development fund and consulting organizations

there are two types of tenn structure models in the literature the equilibrium models and the no arbitrage models and there are correspondingly two types of interest rate derivatives pricing fonnulas based on each type of model of the tenn structure the no arbitrage models are characterized by the work of ho and lee 1986 heath jarrow and morton 1992 hull and white 1990 and 1993 and black dennan and toy 1990 ho and lee 1986 invent the no arbitrage approach to the tenn structure modeling in the sense that the model tenn structure can fit the initial observed tenn structure of interest rates there are a number of disadvantages with their model first the model describes the whole volatility structure by a sin gle parameter implying a number of unrealistic features furthennore the model does not incorporate mean reversion black dennan toy 1990 develop a model along the lines of ho and lee they eliminate some of the problems of ho and lee 1986 but create a new one for a certain specification of the volatility function the short rate can be mean fteeting rather than mean reverting heath jarrow and morton 1992 him construct a family of continuous models of the term

#### struc ture consistent with the initial tenn structure data

freshwater is our planet s most precious resource essential for life itself despite this fact many people across our planet face difficulties finding safe clean potable water a u s state department report contends that the world s thirst for water may become a human security crisis by 2040 the world bank reports many developing nations face catastrophe from intensive irrigation urbanization and deteriorating infrastructure also numerous reports contend that in many places un treated wastewater is still released directly into the environment this is particularly true in low income countries which on average treat less than 10 of their wastewater discharges in short we face three imminent challenges regarding freshwater 1 demands by agriculture cities industry and energy production are increasing 2 severe pollution from various contaminants and growing withdrawals are limiting the capacity of waterways to dilute contaminants threatening human and aquatic life and 3 climate change will cause periods of frequent and severe droughts punctuated by acute periods of flooding the goal of this book is to illuminate how the governance of freshwater is a political social economic cultural and ecological challenge the management and provision of water are not merely technical problems whose resolution hinges on hydrological principle cost or engineering feasibility they are products of decisions made by governments businesses and interest groups that exercise control over who has access to water how they use it and in what condition they receive it it discusses basic knowledge about water supply and quality the evolution of water policy in different societies the importance of water to human and environmental health the role of law politics and markets in its allocation use and protection and the importance of ethics in its equitable provision

exhaustible resources the theory of optimal depletion renewable resources the theory of optimal use resource scarcity are resources limits to growth natural resources and natural environments environmental pollution some concluding thoughts the role of economics in the study of resource and environmental problems

this lecture notes provides an overview of budgeting and financial management in the public and non profit sectors fundamental concepts and practices of budgeting financial management and public finance are introduced with special emphasis on state and local government budgeting and financial management in the united states the objectives of courses in public budgeting and this title are to teach the basic concepts and nomenclature of public finance to develop an understanding of budget processes as well as the sources and uses of public revenues and to make relatively simple but useful computations in an intelligent way key course learning outcomes include the abilities to there are no indispensable pre requisites by the reader and it has been designed for students from a wide variety of backgrounds and undergraduate majors although this works well as an introductory text to a broader public administration curriculum it also can make sense for students to take after some more basic courses in economics policy analysis and public organizations issues of tax incidence and the effect of taxes on economic efficiency can be covered in greater depth

the ideal introductory textbook to the politics of the policymaking process this textbook uses modern political economy to introduce students of political science government economics and public policy to the politics of the policymaking process the book s distinct political economy approach has two virtues by developing

general principles for thinking about policymaking it can be applied across a range of issue areas it also unifies the policy curriculum offering coherence to standard methods for teaching economics and statistics and drawing connections between fields the book begins by exploring the normative foundations of policymaking political theory social choice theory and the paretian and utilitarian underpinnings of policy analysis it then introduces game theoretic models of social dilemmas externalities coordination problems and commitment problems that create opportunities for policy to improve social welfare finally it shows how the political process creates technological and incentive constraints on government that shape policy outcomes throughout concepts and models are illustrated and reinforced with discussions of empirical evidence and case studies this textbook is essential for all students of public policy and for anyone interested in the most current methods influencing policymaking today comprehensive approach to politics and policy suitable for advanced undergraduates and graduate students models unify policy curriculum through methodological coherence exercises at the end of every chapter self contained appendices cover necessary game theory extensive discussion of cases and applications

this book contains a set of notes prepared by ragnar frisch for a lecture series that he delivered at yale university in 1930 complete with an introdutory essay from olav bjerkholt and duo qin placing the notes in their historical context

this book is an outgrowth of years of teaching and doing re search at the university of california san diego ucsd in the area of economic growth although there have been several books on this topic published in the last eight years i have been dis satisfied with them for several reasons first books such as those by wan burmeister and dobell are uneven in their technical difficulty and while they are excellent are apparently difficult for first year graduate students and advanced undergraduates solow s expository book on the other hand is at the other ex treme furthermore many of the books seem to be aimed at the authors peers rather than the students my primary objective in writing this book is to bridge this gap and to pitch very appro priately i hope at the level of a typical student enrolled in a beginning course in growth theory secondly almost all the growth models in the literature can be recast in a single analyti cal framework although the various authors have not written so as to conform to any particular pattern it is the function of a textbook writer to identify such a pattern if it exists and pre sent the theory in that framework many authors make implicit as sumptions about their models which are either never specified or sometimes specified in footnotes

this book is based on lectures conducted for two classes at the maxwell school syracuse university a public finance seminar for phd students in public administration and state and local public finance for master s students in public administration topics covered include the role of voters in a federal system the sorting of different households into different communities the determinants of public service costs the property tax and other sources of local and state revenue fiscal aspects of economic development and intergovernmental aid especially for education the notes for the ph d class also cover several more advanced topics such as the estimation of education production and cost functions the capitalization of school quality into house values and tax competition among jurisdictions the focus in these notes is on the highly decentralized federal system in the united states but many of the principles and much of the behavioral analysis in the class apply to other countries as well these notes draw on professor yinger s extensive teaching experience and publication record in state and local public finance they should prove useful to many teachers scholars and students who find topics in state and local public finance that they wish to pursue

new print with professional type set in contrast to scanned prints offered by others the principles of economics with applications to practical problems this book is a result of an effort made by us towards making a contribution to the preservation and repair of original classic literature in an attempt to preserve improve and recreate the original content we have worked towards 1 type setting reformatting the complete work has been re designed via professional layout formatting and type setting tools to re create the same edition with rich typography graphics high quality images and table elements giving our readers the feel of holding a fresh and newly reprinted and or revised edition as opposed to other scanned printed optical character recognition ocr reproductions 2 correction of imperfections as the work was re created from the scratch therefore it was vetted to rectify certain conventional norms with regard to typographical mistakes hyphenations punctuations blurred images missing content pages and or other related subject matters upon our consideration every attempt was made to rectify the imperfections related to omitted constructs in the original edition via other references however a few of such imperfections which could not be rectified due to intentional unintentional omission of content in the original edition were inherited and preserved from the original work to maintain the authenticity and construct relevant to the work

uncertainties and changes are pervasive characteristics of modern systems involving interactions between humans economics nature and technology these systems are often too complex to allow for precise evaluations and as a result the lack of proper management control may create significant risks in order to develop robust strategies we need approaches which explic itly deal with uncertainties risks and changing conditions one rather general approach is to characterize explicitly or implicitly uncertainties by objec tive or subjective probabilities measures of confidence or belief this leads us to stochastic optimization problems which can rarely be solved by using the standard deterministic optimization and optimal control methods in the stochastic optimization the accent is on problems with a large number of deci sion and random variables and consequently the focus ofattention is directed to efficient solution procedures rather than to analytical closed form solu tions objective and constraint functions of dynamic stochastic optimization problems have the form of multidimensional integrals of rather involved in that may have a nonsmooth and even discontinuous character the tegrands typical situation for hit or miss type of decision making problems involving irreversibility ofdecisions or and abrupt changes ofthe system in general the exact evaluation of such functions as is assumed in the standard optimization and control theory is practically impossible also the problem does not often possess the separability properties that allow to derive the standard in control theory recursive bellman equations

people pursue their own interests whatever those interests might be some people have interests that are narrow and selfish while others have interests that are broad and altruistic the idea that people are self interested underpins all of economic analysis and raises two fundamental questions 1 how do people choose the actions they think will further their own interests 2 can the potentially conflicting interests of different people be made to mesh in some sort of socio economic equilibrium this book is devoted to a detailed study of the first question its companion volume economy wide microeconomics equilibrium optimality applications and tests makes a detailed study of the second question following some foundational remarks this book studies the arrow debreu theory of consumer choice that theory supposes people choose so as to maximize a complete continuous transitive and reflexive binary preference relation over a non empty and compact choice set the book then studies numerous refinements generalizations and extensions of each of these restrictions up to and including recent work on behavioral theories of choice and choice behaviour when preferences are intransitive incomplete discontinuous also considered is choice behaviour in environments that are not necessarily compact a study is also made of intertemporal choice and choice under uncertainty the study of arrow debreu choice theory and its extensions are presented from the primal dual and revealed preference points of view consumers are not the only agents in the economy as producers are present as well beginning with a study of the arrow debreu idea that producers choose from a convex production set so as to maximize profit the book considers extensions and generalizations of this framework particularly to non convex environments the study is presented from the primal and dual points of view the final chapter in the book provides a link to its companion volume the chapter indicates how the theories of consumer and producer choice studied here help inform answers of the second question posed above resources are available to instructors who adopt this book more details at worldscientific com worldscibooks 10 1142 12789 sm

the science and management of environmental problems is a vast area comprising both the natural and social sciences and the multidisciplinary links often make these issues challenging to comprehend economics game theory and international environmental agreements the ca foscari lectures aims to introduce students to the multidimensional character of international environmental problems in general and climate change in particular ecology economics game theory and diplomacy are called upon and brought together in the common framework of a basic mathematical model within that framework and using tools from these four disciplines the book develops a theory that aims to explain and promote cooperation in international environmental affairs other books on the topic tend to be research oriented volumes of various papers instead this is a book that offers a reasonably sized synthesis of the multidimensional societal problems of transfrontier pollution particularly of climate change it uses mathematical modeling of economic and game theory concepts to examine these environmental issues and demonstrate many results in an accessible fashion readers interested in understanding the links between ecology and economics as well as the connection between economics and institutional decision making will find in this text not only answers to many of their queries but also questions for further thinking

globalization and recent developments in the world suggest strong relationships between local and global decisions actions and impacts global local relationships are also associated with positive and negative externalities which necessitate policy interventions lecture notes in global local policy interactions discusses the process of building and managing a global public policy and the interaction of public policies at the global and local national regional levels this book demonstrates the global negative externalities from under regulation of various activities by one agent country that affect the well being of other agents countries and the design of policies agreements to reduce the impacts of such externalities possible opposed interests to global policies of local stakeholders and the local policies they established to tackle such externalities in their jurisdictions are included as well the book introduces concepts and principles associated with conflict negotiation and cooperation all of which are part of policy reform and design it explores to various extents the global local interactions that are related to selected global policies special emphasis is placed on global policies such as climate change water anti terrorism tobacco control regulation of substances that deplete the ozone layer desertification and

#### elimination of anti personnel mines

a rigorous but nontechnical treatment of major topics in urban economics lectures on urban economics offers a rigorous but nontechnical treatment of major topics in urban economics to make the book accessible to a broad range of readers the analysis is diagrammatic rather than mathematical although nontechnical the book relies on rigorous economic reasoning in contrast to the cursory theoretical development often found in other textbooks lectures on urban economics offers thorough and exhaustive treatments of models relevant to each topic with the goal of revealing the logic of economic reasoning while also teaching urban economics topics covered include reasons for the existence of cities urban spatial structure urban sprawl and land use controls freeway congestion housing demand and tenure choice housing policies local public goods and services pollution crime and quality of life footnotes throughout the book point to relevant exercises which appear at the back of the book these 22 extended exercises containing 125 individual parts develop numerical examples based on the models analyzed in the chapters lectures on urban economics is suitable for undergraduate use as background reading for graduate students or as a professional reference for economists and scholars interested in the urban economics perspective

#### this book was the first in the exciting field of social learning

the only introductory economics text to equip students to address today s pressing problems by mastering the conceptual and quantitative tools of contemporary economics oup has partnered with the international collaborative project of core researchers and teachers to bring students a book andlearning system that complements and enhances core s open access online e book the economy is a new approach that integrates recent developments in economics including contract theory strategic interaction behavioural economics and financial instability it challenges students to address inequality climate change economic instability wealth creation and innovation andother problems it has been adopted as the standard principles course at university college london sciences po paris and the toulouse school of economics a new economics for the principles course the economy begins with social interactions using elementary game theory and institutions modelled as rules of the game this provides the basis for a modern treatment of markets including price making as well as price taking the exercise of power and the importance of social norms and adjustmentto disequilibria introducing labour and credit markets with incomplete contracts allows a consistent treatment of aggregate employment and fluctuations without the need for ad hoc sticky price and wage assumptions banks create money by extending credit and a central bank seeks to implement a target inflation rate growth and instability are illustrated from the great depression through the post war golden age of capitalism through to the financial crisis and ensuing uncertainties students acquire an understanding of the past and current evolution of the economy in its social and environmental context equipping them to marshal evidence and articulate positions about contemporary policy issues

this book written by joakim westerholm professor of finance and former trading professional is intended to be used as basis for developing courses in securities markets trading and market microstructure and connects theoretic rigor with practical real world applications market technology evolves the roles of market participants change

and whole market segments disappear to be replaced by new ways to exchange securities yet the same underlying economic principles continue to drive trading in securities markets thus the scope of the book is global providing a framework that is relevant both for current market designs and for future markets we will see develop it is designed to stay relevant in a rapidly evolving field the book contains a selection of lecture notes through which students will gain an in depth understanding of the mechanism that drives trading in securities markets the book also contains another set of lecture notes with more advanced research based material suitable for honours or master level research students or for phd candidates the material is self explanatory and can also be used for self study preferably in conjunction with assigned readings

sound knowledge of rigorous probability and statistics methods is essential to pursue graduate studies in economics these sorts of tools are largely required to conduct research in modern fields of economics such as economic theory empirical economics experimental economics or data science for economics these notes provide an intuitive roadmap to navigate graduate level courses in mathematical probability and statistics for economists each chapter presents questions prevalent on each topic and lays out the state of the art theoretical frameworks used to address such questions the book offers a diverse array of solved examples to help gain intuitions on abstract concepts as well as unsolved exercises to stimulate the readers training in such concepts the book presents the theoretical side of probability and statistics in a rather concise way and stresses the importance of motivating examples and observations

intermediate microeconomics offers a clear and concise treatment of microeconomic principles in a useful pedagogic framework the mathematical level is approachable and uses basic algebra with extensions to calculus where it helps the analysis the book is also strongly applied in focus and shows the relevance of theory in the real world whilst these features make the book approachable to students the theoretical content and overall learning experience is a rigorous one in this adapted edition peter luke and michael wood have been brought in to adapt the text for the uk european and south african market applications features in the book have been internationalised and the european social model us uk model debate on the macroeconomy discussed at a micro level this book is designed for students specifically studying economics at an undergraduate or postgraduate level such as mba within the uk and eu in general and south africa these students would be predominantly second year students who have already taken an introductory course in microeconomics

usually the first edition of a book still contains a multiplicity of typographic con ceptional and computational errors even if one believes the opposite at the time of publication as this book did not represent a counterexample to this rule the current second edition offers a chance to remove at least the known shortcomings the book has been partly re organized the previously rather long chapter 4 has been split into two separate chapters dealing with discrete time and continuous time approaches to nonlinear economic dynamics the short summary of basic properties of linear dynamical systems has been banned to an appendix because the line of thought in the chapter seems to have been unnecessarily interrupted by these technical details and because the book concentrates on nonlinear systems this appendix which mainly deals with special formal properties of dynamical systems also contains some new material on invariant subspaces and center manifold reductions a brief introduction

into the theory of lags and operators is followed by a few remarks on the relation between the true properties of dynamical systems and their behavior observable in numerical experiments additional changes in the main part of the book include a re consideration of popper's determinism vs inde terminism discussion in the light of chaotic properties of deterministic nonlinear systems in chapter 1 an investigation of a simultaneous price quantity adjustment process a more detailed inquiry into the uniqueness property of limit cycles and a short presentation of relaxation oscillations are included in chapter 2

lionel robbins 1898 1984 is best known to economists for his essay on the nature and significance of economic science 1932 and 1935 to the wider public he is well known for the robbins report of the 1960s on higher education which recommended a major expansion of university education in britain however throughout his academic career at oxford and the london school of economics in the 1920s and as professor of economics at the school from 1929 to 1961 he was renowned as an exceptionally gifted teacher generations of students remember his lectures for their clarity and comprehensiveness and for his infectious enthusiasm for his subject besides his famous graduate seminar his most important and influential courses at lse were the principles of economic analysis which he gave in the 1930s and again in the late 1940s and 1950s as well as the history of economic thought from 1953 until long after his official retirement this book publishes for the first time the manuscript notes robbins used for his lectures on the principles of economic analysis from 1929 30 to 1934 40 at the outset of his career he took the advice of a senior colleague to prepare his lectures by writing them out fully before he presented them the full notes for most of his pre war lectures survive and are eminently decipherable since he made two major revisions of the lectures in the 1930s the principles notes show both the development of his own thought and the way he incorporated the major theoretical innovations made by younger economists at lse such as john hicks and nicholas kaldor or elsewhere notably joan robinson he intended to turn his lecture notes into a book abandoning the project only when he was asked to chair the committee on higher education in 1960 this volume is not exactly the book he wanted to write but it is a unique record of what was taught to senior undergraduate and graduate economists in those years of high theory it will be of interest to all economists interested in the development of economics in the twentieth century

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### **OBS Backup: Protecting Your Streaming and Recording Efforts**

OBS Studio (Open Broadcaster Software) is a powerful, free and open-source software for recording and live streaming video. However, the effort invested in creating high-quality streams and recordings—from meticulously planned scenes to perfectly timed transitions—is easily lost without a robust backup strategy. This article explores different methods of OBS backup, emphasizing the importance of protecting your work and offering practical advice on implementing a reliable system.

# 1. Understanding the Need for OBS Backups

Losing hours, or even days, of carefully crafted recordings or live streams due to a software crash, hard drive failure, or accidental deletion is devastating. OBS backups safeguard your work against such unforeseen circumstances. A well-defined backup plan mitigates the risk of data loss, ensuring the preservation of your valuable recordings and project settings. This is especially crucial for professionals, educators, and content creators who rely on OBS for their income or educational purposes. Imagine spending an entire day filming a tutorial, only to have your hard drive crash, erasing all your progress. Or picture a live stream of a crucial event being interrupted by a system failure, resulting in irretrievable content. These scenarios highlight the absolute necessity of having a reliable OBS backup system in place.

## 2. Types of OBS Backups: Data vs. Settings

OBS backups primarily fall into two categories: Data Backups: This refers to the actual recording files (.mp4, .flv, etc.) generated by OBS. These files are the core output of your streaming and recording efforts. Protecting these files is paramount. Settings Backups: These backups preserve your OBS configuration, including scenes, sources, transitions, audio settings, and recording settings. This is important for maintaining consistency across your projects and avoiding the need to reconfigure everything if you need to reinstall OBS or switch computers. Ideally, you should implement backups for both data and settings. Losing your recordings is obviously a major setback, but losing your meticulously crafted scenes and settings can also be incredibly time-consuming to recreate.

### 3. Implementing Data Backups: Strategies and Tools

Several effective strategies exist for backing up your OBS recording data: External Hard Drives: A simple and readily available method is to copy your recordings to an external hard drive after each recording session. This is especially effective for smaller projects. Remember to label your drives clearly and store them securely. Cloud Storage Services: Cloud services like Google Drive, Dropbox, OneDrive, and Backblaze offer convenient automated backups. These services automatically upload your files to a remote server, protecting them against local hard drive failures. The downside is the potential cost for larger storage needs. RAID Systems: For professionals who handle vast amounts of recording data, a RAID (Redundant Array of Independent Disks) system offers the highest level of data protection. RAID systems combine multiple hard drives to provide redundancy and increase storage capacity, ensuring data is protected even if one hard drive fails. Regardless of the method chosen, it's crucial to regularly check the integrity of your backups. Test your backups periodically by restoring a file to verify its accessibility and usability.

### 4. Backing up OBS Settings and Profiles

Backing up your OBS settings is equally important. OBS allows you to export your entire profile, preserving all your scenes, sources, and settings. To do this: 1. Open OBS Studio. 2. Navigate to `File` > `Export Settings`. 3. Choose a location to save your settings file (usually a `.json` file). 4. Keep this file in a safe and accessible location, ideally backed up along with your data backups. Regularly exporting your settings ensures that you can quickly restore your configuration should something happen to your OBS installation. Consider storing this file separately from your recording data as an additional layer of protection.

# 5. Creating a Comprehensive Backup Strategy

A holistic backup strategy for OBS requires a multi-pronged approach. Consider combining several methods to maximize data protection: Regular Backups: Implement a schedule for backing up both data and settings, preferably daily or after each significant recording session. Multiple Backup Locations: Storing backups in multiple locations (e.g., an external hard drive and cloud storage) reduces the risk of complete data loss. Version Control: For particularly important projects, consider using version control systems like Git to track changes and revert to previous versions if necessary. This is less common for video files but could be suitable for associated project files like scripts or graphics. Offsite Storage: Store at least one copy of your backups offsite, protecting against local disasters like fires or theft.

### Summary

Implementing a robust OBS backup strategy is crucial for safeguarding your valuable recordings and configurations. By combining data backups (using external drives, cloud services, or RAID systems) with regular settings exports, you can significantly reduce the risk of data loss. A well-defined, multi-faceted backup plan ensures peace of mind, knowing that your hard work is protected against unforeseen circumstances.

# FAQs

1. How often should I back up my OBS recordings? Ideally, back up your recordings daily or after each significant recording session. The frequency depends on the importance of the material and your risk tolerance. 2. What is the best type of external hard drive for OBS backups? An external hard drive with a USB 3.0 or higher connection offers faster transfer speeds. Consider a drive with a large capacity based on your recording needs. 3. Can I use cloud storage for OBS recordings? Yes, cloud storage services like Google Drive, Dropbox, and OneDrive are viable options, but be mindful of storage costs and upload/download speeds, especially for large files. 4. What happens if I lose my OBS settings backup? You will need to manually reconfigure all your scenes, sources, and settings. This can be time-consuming, emphasizing the importance of regular settings backups. 5. Is there a way to automate my OBS backups? Yes, many cloud storage services offer automated backup features. You can also use third-party backup software to automate the process of copying your recordings to an external drive.

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