

The Institute of Economics: Overview and Prospects

1. Introduction

This document is based on a report prepared for the annual visit of the IAB on July 6-7, 2020. The document has been written by Alessandro Nuvolari in collaboration with Federico Tamagni and with the feedback of the other members of the Giunta of the Institute and of Giorgio Fagiolo as coordinator of the Laurea Magistrale in Economics. The document provides an up-to-date picture of the current position of the Institute and sketches opportunities and challenges for the future. For these reasons, it can provide a useful background for the meeting on the election of the Director of the Institute. This revised version contains the views of Alessandro Nuvolari and they are not necessarily shared by the members of the Giunta or Giorgio Fagiolo.

2. Faculty and Support Staff

Over the period 2018-20, thanks to the contribution of the Department of Excellence, the faculty of the Institute has grown considerably. The details of this recruitment campaign are set out in table 1 below.

Table 1: Recruitment of the Institute of Economics, 2018-2020

PROMOZIONI	PROFESSORI ASSOCIATI	RTD-B	RTD-A
Andrea Roventini PA/PO	Laura Magazzini	Francesco Lamperti	Daniele Giachini
		Daniele Moschella	Francesco Lamperti
Arianna Martinelli RTD-B/PA		Andrea Vandin	
		Maria Enrica Virgillito	

The extra-funds for recruitment of the Department of Excellence have been fully exploited. Thus, in the near future, all the recruitment will be based on the ordinary funding from the Ministry. Given the degree of internal competition within the School, the Institute should be ready to make a very strong case for all the new positions requested.

Concerning the administrative staff, the past three years have been initially difficult because the Institute was afflicted by severe problems of under-staffing (in some instances we had only one person of administrative staff). However, over the last year, with the integration of the Institute of Management and Economics the situation has substantially improved. The current situation is the following (in italics the recent recruitment).

Support staff

- Mariagrazia Nardi (administrative head)
- Laura Ferrari
- *Gian Marco Mannocci*
- *Anita Pampana/Federica Bertolucci*

In this moment, the size of the administrative staff is fully adequate to the needs of the Institute. My own impression (corroborated by some talks with both faculty and administrative staff) is that,

right now, both faculty and staff are satisfied with the current organizational arrangements and that the working atmosphere at the Institute is positive and relaxed.

As you all know, the DG of the School has decided to undertake a major organization restructuring which involves all the Institutes. It is important that this restructuring will not have a negative impact on the activities of the Institute and, possibly, on the working atmosphere of the Institute and on its culture of openness and cooperation. In particular, for a small Institute like ours, it is of key-importance that the reorganization and the new procedures will not result in an additional bureaucratic or administrative burden for the researchers.

3. Research profile

Figure 1 provides a graphical representation of the research profile of the Institute. This profile has been designed in 2018 after some discussions in the Giunta of the Institute. The picture is not complete and it does not do full justice to some research activities of the Institute. On the other hand, it has the advantage of being synthetic and, for these reasons, more suitable for presentations that should provide a compact overview of the Institute.

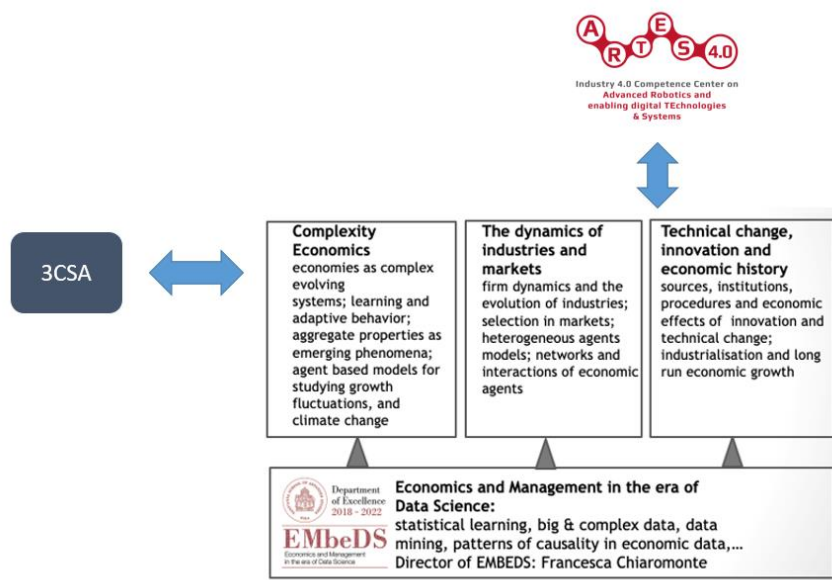
Figure 1 shows that traditionally, the research agenda of the Institute has covered three broad lines of research:

- Complexity Economics: modelling economies as complex adaptive systems characterized by learning and adaptive behavior of agents; patterns of economic change such as growth and fluctuations are understood as emerging properties of micro-level interactions.
- The dynamics of industries and markets: empirical and theoretical studies of processes of learning, interaction and selection taking places in economic systems (including the emergence and demise of networks).
- Technical change, innovation and economic history: sources, institutions, drivers and effects of innovation and technical change; industrialization and long-run economic growth.

Thanks to the additional funding of the Department of Excellence EMbeDS, in the next future the Institute aims to further consolidate its position in these research fields, by exploiting the opportunities provided by data science and advanced quantitative methodologies. The resources of EMbeDS have been used: i) to recruit researchers with advanced data and computing competences, ii) to access large-scale databases; iii) to set-up a high computing infrastructure (this infrastructure has been also made available to other Institutes of the School).

Furthermore, in the last two years, the Institute has also fruitfully collaborated with 3CSA, the joint department of Scuola Sant'Anna, Scuola Normale and IUSS-Pavia for the study of climate change. Finally, the Institute of Economics is also involved in ARTES 4.0, the Competence Centre of Sant'Anna School on Advanced Robotics and enabling Technologies & Systems.

Figure 1: Research Profile of the Institute of Economics.



4. Research Performance and Publications

The Institute has a strong research record. In the two research assessment exercises (VQR) carried out by the Italian National Agency for the Evaluation of Universities and Research Unities (ANVUR) carried out so far, the Institute was rated 2nd (2004-2010) and 3rd (2011-2014) in the area of Economics and Management. In 2018, together with the Institute of Management, the Institute of Economics has been awarded the prestigious prize-funding of the Department of Excellence for the period 2018-2022.

Table 1 reports the publications of the Institute included in the SCOPUS database for the period 2015-2019. The table reports the publications for full professors, associate professors and assistant professors (post-doc and PhD students are not included) and it shows two types of research outputs: the number of articles in journals listed in Scopus database (excluding book chapters, notes, reviews and short contributions) and the number of articles published in in the top 25% journals for SJR score.¹ The data are clearly to be interpreted with caution, given the vagaries of publication times in social sciences journals. Still, they seem to point to an increase in the number of publications per capita, in particular in the segment of publications in top 25% journals.

¹ The SCImago Journal Rank (SJR) indicator is a measure of the scientific influence of scholarly journals that accounts for both the number of citations received by a journal and the importance or prestige of the journals where the citations come from. A journal's SJR is a numeric value indicating the average number of weighted citations received during a selected year per document published in that journal during the previous three years. Higher SJR values are meant to indicate greater journal prestige. This indicator is used in yearly internal research assessments carried out by the School to allocate funding to the Institutes.

Table 1: Scholarly output of the Institute of Economics, 2015-2019 (SCOPUS)

	2015	2016	2017	2018	2019
Number of papers	41	26	43	38	70
Papers per capita	2.6	1.6	2.7	2.4	4.4
Number of papers (top 25% SJR)	26	13	28	25	42
Papers (top 25% SJR) per capita	1.6	0.8	1.8	1.6	2.6

Table 2 and 3 provide some insights on the scope of the publications of the Institute in the same period. In table 2 we report the number of publications-authors. The aim of the table is to show the journals on which the faculty of the Institute is most active, so the count includes both the number of papers and the number of authors (that is if two faculty members publish a paper together on *Research Policy* this journal is counted as 2 in terms of number of publication-authors).

Table 2: Publications in the period 2015-2019

Journal	Number of papers-authors
Industrial and Corporate Change	15
Journal of Evolutionary Economics	15
Research Policy	11
Small Business Economics	11
Journal of Economic Dynamics and Control	8
Proceedings of the National Academy of Sciences of the United States of America	7
Ecological Economics	7
Macroeconomic Dynamics	6
Journal of Economic Interaction and Coordination	6
European Journal of Economics and Economic Policies: Intervention	5
Structural Change and Economic Dynamics	5
Technological Forecasting and Social Change	4
Journal of Economic Behavior and Organization	4
Economia e Politica Industriale	4

Table 2 suggests that the research activities of the Institute are concentrated in top-field journals in the field of innovation and industrial dynamics and macroeconomics journals open to evolutionary and agent-based models.

Table 3 provides a list of the journals with the highest SJR score in which the faculty members of the Institute have published in the period 2015-2019. Clearly, the results are highly dependent on the research field. Journals of genetics or statistics have structurally a higher SJR score than many journals in Economics and social sciences. The aim of the table is to provide a snapshot of the recent activities of the institute, beyond its three traditional core areas. The point emerging from Table 3 is that some research of the Institute is moving towards general interest journals (*PNAS*) or highly ranked journals publishing interdisciplinary research (*Nature Climate Change*, *Monthly Weather Review*, *Environmental*

Innovation and Societal Transitions, Socio-Economic Review, etc.). Notably, the list includes also several journals in economics with high standing.

Table 3: Journals with the highest SJR-2019 over the period 2015-2019

Journals	SJR - 2019
Genome Research	9.245
Molecular Biology and Evolution	8.162
Journal of the European Economic Association	7.832
Nature Climate Change	7.735
Proceedings of the National Academy of Sciences of the United States of America	5.165
Journal of the American Statistical Association	4.814
Global Environmental Change	4.304
Bioinformatics	3.567
Research Policy	3.246
Briefings in Bioinformatics	3.109
PLoS Computational Biology	2.91
Environmental Innovation and Societal Transitions	2.782
Environmental Research Letters	2.675
Socio-Economic Review	2.67
Journal of Computational and Graphical Statistics	2.511
Journal of Applied Econometrics	2.379
Monthly Weather Review	2.264
World Development	2.223
Journal of Economic Geography	2.192
Current Opinion in Environmental Sustainability	1.968
Small Business Economics	1.929
Biometrics	1.894
Journal of Economic History	1.884
Technological Forecasting and Social Change	1.815
Journal of Economic Surveys	1.806

5. Research Projects

These are the major active research projects in which the Institute is involved:

Horizon 2020

- GROWINPRO: Growth Welfare Innovation Productivity (GA822781)
Sponsor: European Commission H2020 SC6-TRANSFORMATIONS-2018 - RIA
Period: 2019-2021
PI and consortium coordinator: Andrea Roventini
Grant: SSSA € 681.750 – Total € 2.997.700
- Recreating EUrope - Rethinking Digital Copyright Law for a Culturally Diverse, Accessible, Creative Europe (GA 870626)

Sponsor: European Commission - H2020-SC6-GOVERNANCE-2018-2019-2020
Period: 2020-2022
PI and consortium coordinator: Caterina Sganga (Sant'Anna-DIRPOLIS)
PI for the IoE: A. Nuvolari
Grant: SSSA € 598.989 (IoE € 239.375) – Total € 3.087.928

PRIN 2017 (PRIN stand for Research Projects of Major National Interest, funded by the Italian Ministry of University)

- How good is your model? Empirical evaluation and validation of quantitative models in Economics.
Sponsor: PRIN 2017 – MIUR Italian Ministry for University and Research
Period: 2020-2023
PI and consortium coordinator: Alessio Moneta
Grant: SSSA € 161.403 – Total € 301.860
- Technological change, industry evolution and employment dynamics
Sponsor: PRIN 2017 – MIUR Italian Ministry for University and Research
Period: 2020-2023
PI for the IoE: Daniele Moschella
Grant: SSSA € 198.950 – Total € 606.603
- Lost highway: skills, technology and trade in Italian economic growth, 1815-2018
Sponsor: PRIN 2017 – MIUR Italian Ministry for University and Research
Period: 2020-2023
PI for the IoE: Alessandro Nuvolari
Grant: SSSA € 159.000 – Total € 539.813

Other competitive grants

- Economics of Energy Innovation and System Transition
Sponsor: U.K. Department for Business, Energy & Industrial Strategy
Period: 2020-2022
PI for the IoE: Andrea Roventini
Grant: SSSA GBP 200.000

It is interesting to note that the projects Recreating Europe and Economics of Energy Innovation and System Transition have been developed in close collaboration with other Institutes of the School. Recreating Europe is the outcome of a collaboration between the Institute of Economics and DIRPOLIS and Economics of Energy Innovation is the outcome of a collaboration between the Institute of Economics and Institute of Life Sciences withing the framework of 3CSA.

6. Training

The training activities of the Institute take place mostly in the context of two teaching programs: the Master of Science in Economics in collaboration with the University of Pisa (<http://mse.ec.unipi.it/>), and

the Sant'Anna – IUSS PhD in Economics (<https://www.santannapisa.it/en/formazione/international-doctoral-programme-economics>)

7.1. Master of Science in Economics

The Master of Science in Economics was launched in 2011. It was one of the first Master programs (Laurea Magistrale) developed by Sant'Anna School in collaboration with a traditional University. The program has the standard configuration of 2-years Master programs within the so-called Bologna system of higher education, with a coursework and thesis covering 120 study credits (ECTS). In these ten years the program has developed a very strong reputation for providing students with a very sound background in Economics, becoming increasingly attractive for both Italian, but even more for foreign students. The good performance of the program is also testified by its graduates being consistently accepted for PhD posts in Economics or Management in highly ranked universities both in Europe (London School of Economics, SOAS, Imperial College, UNU-Merit, Carlos III Madrid, etc.) and in the US (Berkeley, University of Chicago, Columbia University, University of Pennsylvania, etc.); also the placement in the private and public sectors has been excellent.

Each year about 40 students are selected for the Master. Table 4 shows the number of applications over the last five years.

Table 4: Applications to the Master of Science in Economics, 2016-2020

Year	2016	2017	2018	2019	2020
No. of applications	217	274	432	635	556
No. of foreign applications	166	237	377	594	505

Furthermore, there are opportunities in sight for a further consolidation of the success of the Master of Science in Economics. The opening of the scholarships for positions of Allievo at the LM level can increase the attractiveness and the reputation of the program. Accordingly, it is important to keep the pressure for the increase of this type of scholarships. Another opportunity is represented by the possibility of involvement of SNS (even if, on this front, things are moving very slowly).

7.2 Sant'Anna -IUSS PhD in Economics

The PhD programme in Economics has been (and is) one of the most renowned PhD in Economics in the Italian academic landscape. The programme is strongly embedded in the research activities of the Institute. Another salient feature of the programme is the extremely thorough and rigorous course-work (lasting 15 months). Notably, the first two PhD degrees Honoris Causa granted by Scuola Sant'Anna have been for this PhD programme: in 2017 to Nobel Laureate Joseph Stiglitz and in 2018 to Mario Draghi (former President of the European Central Bank).

The strong performance of the doctoral programme is testified by the very good results in terms of placement: the recent graduates of the programme have landed on assistant professor (tenure-track) or post-doc positions in prestigious universities abroad and in Italy (Paris Sorbonne, University of Utrecht, University of York, CNR, Catholic University of Milan, Sciences Po, New School in New York, University of Strasbourg, University of Tokyo, etc.), on research positions in major national or international organizations (OECD, Joint Research Centre-European Commission, Bank of Italy, Ministero

dell'Economia e delle Finanze, United Nations Economic Commission for Latin America and the Caribbean (CEPAL), etc.) and also on positions in the banking sector (UBS).

Further evidence on the quality of the programme emerges from the publication record of the PhD students. Chapters of the theses defended have been published consistently in leading journals such as *Research Policy*, *Regional Studies*, *Journal of Economic History*, *Econometrica*, *Journal of Economic Dynamics and Control*, *Industrial and Corporate Change*, *World Development*, *Journal of Economic Interaction and Coordination*, *Advances in Complex Systems*, *Small Business Economics*, *Journal of Economic Behaviour and Organization*, *Scientometrics*, *Ecological Economics*, *PNAS*, *Plos ONE*,...

To understand the current situation of the PhD programme is necessary to be acquainted with its development over the last five years. In 2015 it was decided to expand the duration of the scholarships from 3 to 4 years. The decision was taken after having considered that the very intensive course-work (which is a plus and distinctive feature of our PhD) made it for many students quite difficult to finish in three years. At the same time, a duration of 4 years is also becoming a sort of "standard" for many PhD in Economics in Europe. This had the side-effect of a reduction in the number of scholarships offered. In fact, the total budget remained at the same level. Accordingly, it was necessary to cover the additional year by reducing the number of scholarships offered. However, in 2016, thanks to the interest of IUSS-Pavia in becoming involved in postgraduate training in Economics (Prof. Luigi Orsenigo was at the time Professor of Applied Economics at IUSS), the PhD programme was rearranged in a joint Sant'Anna-IUSS PhD programme in Economics. This was one of the first concrete examples of collaboration within the framework of the Federation of the Special Schools, which at the time comprised only Sant'Anna and IUSS. As a result, in the years 2016, 2017 and 2018 the programme received an extra budget from IUSS, used to cover three additional scholarships, leading to a class of respectively 6, 6 and 7 students. In terms of the size of the class, a level of 6/7 students seems to be a sort of minimum efficient scale for this type of programme. Unfortunately, the collaboration with IUSS did not resist the test of time: internal difficulties and some re-focusing of research/teaching areas within IUSS, together with difficulties in starting other joint programmes between the two institutions, have resulted in a decision by IUSS to suspend the funding of the scholarships in Economics, even if the PhD still formally remains joint programme between the two institutions. In retrospect, the lack of support of Sant'Anna School to the doctoral programme after the retreat of IUSS is also to be blamed: in fact, the School did not intervene to compensate, even in a partial way, the sharp decrease in resources and scholarships caused by IUSS withdrawal. There was also lack of institutional support from the rectors of both schools about maintaining alive a cooperation between IUSS and Sant'Anna in the area of Economics (notwithstanding several efforts of professors in both schools). It is interesting to note that, while this crisis of the PhD programme was unfolding, Scuola Sant'Anna has provided generous support to research and training initiatives of other Institutes (some of them even in an experimental stage).

At all events, since 2018, the programme is running at a somewhat sub-optimal capacity. In 2018, one additional scholarship has been granted thanks to the funding of the Department of Excellence EMbeDS, but this funding is going to be discontinued from next year. In 2020, it was possible to fund one extra scholarship, but also this was due to some special circumstances (savings from scholarship of students that withdrew from the program), unlikely to be repeated in the future. In this moment the prospects for the PhD in Economics are bleak. The actual and provisional funding from Sant'Anna budget is only sufficient to cover three scholarships and the costs of teaching.

It is also worth mentioning that there is an agreement of collaboration since 2018 with the International PhD in Economics of the University of the Cote d'Azur (Nice). Formally, this is a cooperation for exchange of students and lectures, but a jointly designed course programme is in fact in place, including students from both institutions, attending the entire first year in Pisa and 3 months of the second year in Nice. This enlarged community of students, fostered internationalization, and allowed to offer an even broader spectrum of courses together with some savings on the budget (though not sufficient to create the space for an additional scholarship). In any case, the results in terms of teaching cooperation and joint supervision of students are promising.

Table 5 provides an overview of the budget and the number of scholarships granted over the period 2015-2020 with the prospects for 2021.

Table 5: Budget and Scholarships of the PhD in Economics, 2015-2021

Years	Budget (€)	PhD scholarships	Budget (€) SSSA	PhD scholarships SSSA	Budget (€) IUSS	PhD scholarships IUSS	Budget (€) EMbeDS	PhD scholarships EMbeDS
2015	363,358	4	363,358	4				
2016	618,605	6	357,362	3	261,243	3		
2017	631,102	6	364,014	3	267,088	3		
2018	702,255	7	349,086	3	268,477	3	84,692	1
2019	444,278	4	359,586	3	0	0	84,692	1
2020	447,250	5	362,558	4*	0	0	84,692	1
2021	360,000	3	360,000**	3	0	0	0	0

Note: * in this year one extra scholarship was funded by SSSA thanks to residual from withdrawn students. ** this is the amount predicted on the basis of the current criteria adopted by the School for funding the PhD programmes.

7.3 Other training activities

Since 2012 the Institute supports the graduate Summer School of Mathematics for Economics and Social Science in collaboration with the De Giorgi research centre of Scuola Normale.

The Institute is also involved the PhD programme in Data-Science, a joint programme of Scuola Normale Superiore, University of Pisa, IMT Lucca, CNR.

In the next academic years, the Institute is planning to launch a high profile “seasonal school” in Economics. For the first year, we have decided to focus on the “Economics of Innovation” (one of the core research themes of the Institute). This training program will be reassessed after this first experiment. Overall, we believe there is the opportunity of establishing in this field another successful training, thanks to the experience accumulated with both the Master in Economics and the PhD.

7. Outreach

In recent years the Institute has made significant efforts in terms of outreach. The aim of these efforts has been to provide some “traction” for the policy insights emerging from the recent activities of the Institute. Here we would like to report two main recent cases:

- The collaboration with the Forum Disuguaglianze & Diversità (<https://www.forumdisuguaglianzediversita.org/>) a very influential think-tank which is devoted to the elaboration of policy proposals at different levels. The Institute has contributed to the activities of the Forum Disuguaglianze & Diversità on the theme of policies for tackling economic and social inequality in Italy and on the theme of the development of new strategic missions for Italian State-owned companies.
- Several researchers of the Institute have been appointed as members of the task-force of the Italian Minister for Innovation for outlining some strategic solutions for countering the economic impact COVID-19 crisis (<https://innovazione.gov.it/impatto-economico-lockdown/>)

In addition, the Institute has organized a number of high profile events in which policy makers and researchers could engage and interact.

8. SWOT analysis

A) *Strengths:*

Historically, the main strength of the Institute has been its research performance. Over the years, the Institute has developed a research agenda which remains consistently creative and sound, in particular in the three core areas of innovation, industrial dynamics, and agent-based modelling. This has resulted in the consolidation of an important reputation. In many economic circles, both nationally and internationally, today it is recognized that at Sant'Anna there is a significant “school” of economists which is developing an interesting and fruitful approach to economic research.

B) *Weaknesses:*

Given the current prospects on the internal funding from the School for supporting research activities, it will be useful to further expand the capabilities of the Institute of getting external research funds. However, it is of fundamental importance that these efforts will not distract energies from the tradition of the institute of performing “fundamental” research in economics and social sciences.

The lack of resources and limited size of the School makes it difficult the access to large data-set such as ORBIS or ORBIS-IP, that are becoming absolutely vital for carrying out research in some of the core-areas of the Institute. Since 2018, this issue was addressed thanks to the funding of the Department of Excellence, but this is not going to last in the future. The Institute has also made an effort to create collaborations with other universities institutions such as University of Pisa or IMT-Lucca to have common access to data-set such as ORBIS, but the institutional obstacles in this respect seem quite prohibitive.

C) *Opportunities*

The research agenda is expanding in new areas. Besides the developments in the direction of strengthening the “data-science” component of the research carried out in the three core field, the Institute is producing important research results in new areas such as the causes and economic effects of climate change, the intersection between the law and economics of IPR, welfare and economic inequality, etc. Interestingly enough, much of this research is carried out in collaboration with other Institutes of the School (in particular the Institute of Life Sciences and DIRPOLIS). Furthermore, there

are other collaborations between the Institute of Economics and the Institute of Life Science in the area of sustainable development (one of these has resulted in a grant from the Barilla Foundation) and between the Institute of Economics and DIRPOLIS for the application of text-analysis to the study of court decisions. Finally, it is worth mentioning an ongoing collaboration between the Institute and the group of Mathematics of Scuola Normale in the study of financial markets.

Overall, these developments seem to indicate an important opportunity to foster interdisciplinary perspectives and to enlarge the scope of the research agenda of the Institute beyond its three traditional strongholds. However, it would be wrong to interpret these trends as something completely new and detached from the historic research agenda of the Institute. When observed closely, in all these cases, the initial spark was actually triggered by research in the three core areas.

D) Threats

The main threat is the fragility of the PhD programme. For many years, the PhD was one of the main assets of the Institute, with former PhD students hired nationally and internationally contributing to spread successfully the “style” of research in economics done at Sant’Anna. Right now, the programme is undergoing a considerable downsizing, dangerously close or below to the minimum threshold that would be necessary to create a stimulating and vivid training/research environment for the PhD students. Without additional resources, the programme does not seem to be sustainable. In the Italian context, getting Phd funding for programme with an intensive coursework and in which the research project is developed not before the start of the Phd, but during the Phd, is prohibitive. External funds may be available, but mostly for very specialized projects, while the general philosophy of our PhD has been to train solid and high-level scholars with broad knowledge of Economics, not specialists of a narrow research field.