



AMSTERDAM
SCHOOL OF
ECONOMICS

Economics

Annual Research report 2017



Amsterdam School of Economics

Preface

The 2017 annual research report of the Amsterdam School of Economics (ASE) documents the organisation, activities and results of its research institute ASE-RI. The funding of the institute provides the financial means for its staff members to write scientific papers and dissertations, attend and organise international workshops and conferences and supervise PhD students.

The ambition of the ASE-RI is for the Amsterdam School of Economics to become a European top 10 Economics department based on its research output in Micro-Economics, Macro-Economics and Quantitative Economics. The research time allocation of the members of ASE-RI is made in line with this ambition. It is therefore aligned with the Research Fellow criteria of the Tinbergen Institute. Newly recruited junior faculty start out as tenure-track assistant professors. The criteria for receiving tenure parallel those for becoming a Tinbergen Institute research fellow.

The overall number of refereed publications in 2017 exceeds those in 2015 and 2016. There were two top five general interest journal publications in 2017 and a considerable number in top field journals which are considered a notch below.

The Amsterdam School of Economics and therefore also ASE-RI pride themselves with their large number of highly qualified successful researchers whose research is documented in this yearly report.

Prof. dr. Frank Kleibergen
Director of the Amsterdam School of Economics Research Institute

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A

THE RESEARCH INSTITUTE

CHAPTER 1: INSTITUTIONAL OVERVIEW

1.1 MISSION STATEMENT

ASE-RI (Amsterdam School of Economics Research Institute) facilitates and promotes research at ASE to foster the academic ideal of intertwined university teaching and research. The institute aims for research results that significantly improve our understanding of the operation of economic systems, the behaviour of agents in the economy and the effects of economic policies. ASE-RI aims to appraise researcher performance and to provide a directive for further research with its standards for research. Research time is allocated to researchers based on their performance.

1.2 ORGANISATION

ASE-RI, the research institute of the Amsterdam School of Economics, is one of the two research institutes of Economics & Business (EB); the other being the research institute of the Amsterdam Business School (ABS-RI). ASE-RI covers the wide area of economics, econometrics and actuarial science.

Research is organised in research programmes, which are directed by programme leaders who are experts with core positions in the curriculum. Stimulating research that significantly improves our understanding of the economy is meant as a focus on fundamental research. In many cases, the inspiration for research questions derives from practical problems in business and society as well as from pressing problems for government policies, as is only natural for a social science. But the research results should primarily be reported to the international academic community and assessed against the quality standards that apply there. Such permanent quality assessment feeds back into the quality of teaching and of advice given to business and the government. Contributions to public debates should be a consequence of developing reliable knowledge about the economy rather than a primary goal.

In addition to the research programmes, ASE-RI also hosts the Research Priority Area (RPA) Behavioural Economics. This is one of the 20 fields in which the UvA wishes to actively foster further development. Researchers from several programmes participate in the RPA Behavioral Economics, in particular in the fields of experimental economics, industrial organization, labour economics, and complex socio-economic systems. In 2014, ASE-RI and ABS-RI jointly have taken the initiative for a research focal area of Economics and Business on Risk and Macro Finance, in which researchers from (behavioural) finance, macro-economics, and actuarial science participate.

ASE-RI closely co-operates with the Tinbergen Institute, where many of ASE-RI's researchers are appointed as fellow. The Tinbergen Institute also acts as the graduate school for ASE-RI students.

1.3 STRATEGY AND POLICY

The main strategic aim of ASE-RI is to produce research in (quantitative) economics with, on the one hand, a high impact on the international academic research agenda, and on the other hand a strong societal relevance.

The first aim is in line with ASE's ambition to become a Top-10 school in Europe in each of the broad areas micro-economics, macro-economics, and quantitative economics (as stated in the ASE Strategic Plan of March 2016). The ambition implies that quality of publications has more emphasis than quantity. Although some variation in publication culture exists among the research programmes, it means that researchers are encouraged to aim at publishing in the top economics journals and in

field journals with a high citation impact (currently measured by the Article Influence Score, AIS). The strategy to reach these aims consists of the following elements.

Personnel policy

As stated in the ASE Strategic Plan, vacancies for new research staff are to be filled at the tenure track level. The school has adopted a 6-year tenure track, with a mid-term review after 3 years. Tenure criteria include, in addition to teaching performance and external funding, the ability to qualify as Research Fellow of the Tinbergen Institute, which requires that five publications in a recent five-year period are in journals with a cumulative AIS of five. In addition, ASE-RI requires that at least three publications are in a medium-impact field journal, or one in a Top-5 journal. As of 2014, recruitment of tenure track assistant professors occurs through the American academic job market, where a joint ASE recruitment committee aims to attract the most talented candidates, in line with the teaching requirements of the research-based bachelor and master programmes that the school offers in combination with the school's Top-10 ambition. Tenure and promotion decisions are made by the Dean. The promotion and Tenure (P&T) Committee advises the Dean based on a standard set of criteria and after the consultation of full professors in the department.

Research time allocation

Each year, tenured faculty members with a research appointment (assistant, associate and full professors) are allocated research time based on research output. Currently the maximum research time for fulltime appointments (except for externally funded research) is 0,5 fte. As of 2014, the criteria for this maximum research time are aligned with criteria for Research Fellowship of the Tinbergen Institute, as indicated above. Researchers who do not satisfy these criteria may earn 0,25 fte, if their research output satisfies the corresponding fraction of the TI criteria. ASE-RI aims to appraise researcher performance and to provide a directive for further research with its standards for research.

PhD programme and placement

A third approach to increasing the school's international research impact is through its PhD programme. As detailed below, ASE-RI's PhD programme is organised by the Tinbergen Institute graduate school. Through a systematic process of training, research supervision and job market preparation, the school aims at (and has succeeded in) placing its PhD graduates at good European and American departments.

ASE-RI also stimulates concentration of the school's research in research programmes by other means (such as providing an annual budget for conference visits and other academic activities to the Research Programmes).

1.4 TARGETS

In view of the general aims, the specific targets related to research that are stipulated in the FEB's strategic plan 2015-2020 are:

- A gradual increase in the percentage of the internal research funds spent on research in the RPA;
- A growth in the number of publications per research fte, in top journals;
- An increase in the percentage of PhD projects completed within four years;
- An increase in the number of PhD defences;
- An increase in the percentage of research funded by the second stream (NWO, KNAW, ERC, EU);
- An increase in the number of personal grants and distinctions;

- An increase in the number of research projects, and income derived from “second money stream” and “third money stream” funding;
- Placement success of PhDs (percentage of PhDs getting placed at either a very good academic institution, or non-academic high profile organisations).

These targets were set at the faculty level, but are in line with the targets for the ASE-RI research programmes, with an emphasis on further growth of external funding to compensate for the expected decline in internal funding for tenured research and PhD positions. A further target is to attract excellent candidates for tenure track assistant professorship positions from the American academic job market, to help realise the ambition to become one of the Top-10 schools in Europe in Economics.

CHAPTER 2: INPUT

2.1 RESEARCH STAFF

Personnel policy and human resource management are the domain of the department chairs and section heads. ASE-RI encourages the sections to hire good researchers and to stimulate faculty to increase the quality and quantity of academic publications, and has a vote in promotion and tenure decisions. Broader strategy issues concerning hiring and firing are discussed within the Amsterdam School of Economics management team and this has resulted in a document on personnel policies in which the requirements that current and new staff should meet are clearly defined.

The tables below give information on ASE-RI faculty. Table I shows that the research capacity declined, for which an important reason is a strong decline in the number of PhD students. A noticeable change is the relative increase of the number of staff financed by the second flow of funds.

Table I: Input research staff at institutional level (FTE)

	fte	2015	2016	2017
WP 1 (first flow of funds)		36,94	39,31	35,54
WP 2 (second flow of funds)		9,97	8,14	11,79
WP 3 (third flow of funds)		39,30	38,47	35,04
PhD students		27,81	22,32	18,10
Total Research staff		114,02	108,24	100,47
Support staff ASE-RI (bureau)		0,89	0,89	1,00
Total Staff		114,91	109,13	101,47

Table II: Input research staff at programme level (FTE)

UvA-Econometrics	fte	2015	2016	2017
WP 1 (first flow of funds)		3,05	3,34	4,14
WP 2 (second flow of funds)		2,33	0,20	0,00
WP 3 (third flow of funds)		0,00	0,00	0,00
PhD students		2,33	0,54	1,60
Total Research staff		5,38	3,54	4,14
Equilibrium, Expecatations & Dynamics	fte	2015	2016	2017
WP 1 (first flow of funds)		5,53	6,93	6,15
WP 2 (second flow of funds)		1,95	1,08	2,76
WP 3 (third flow of funds)		0,00	0,00	0,00
PhD students		2,47	2,94	3,74
Total Research staff		7,48	8,01	8,91
Actuarial Science & Mathematical Finance	fte	2015	2016	2017
WP 1 (first flow of funds)		2,05	2,75	3,53
WP 2 (second flow of funds)		0,00	0,00	0,00
WP 3 (third flow of funds)		4,83	3,58	1,45
PhD students		3,39	3,04	1,87
Total Research staff		6,88	6,33	4,98

<i>Macro and International Economics</i>	fte	2015	2016	2017
WP 1 (first flow of funds)		9,14	9,83	6,36
WP 2 (second flow of funds)		2,18	0,68	0,25
WP 3 (third flow of funds)		2,68	1,88	1,25
PhD students		8,46	6,86	3,15
Total Research staff		14,00	12,39	7,86
<i>Human Capital</i>	fte	2015	2016	2017
WP 1 (first flow of funds)		2,91	2,97	3,02
WP 2 (second flow of funds)		1,06	2,48	3,86
WP 3 (third flow of funds)		0,20	0,20	0,20
PhD students		1,73	1,47	0,94
Total Research staff		4,17	5,65	7,08
<i>Experimental & Political Economics</i>	fte	2015	2016	2017
WP 1 (first flow of funds)		9,53	9,93	8,25
WP 2 (second flow of funds)		1,65	2,90	4,39
WP 3 (third flow of funds)		0,00	0,00	0,00
PhD students		7,05	6,13	4,93
Total Research staff		11,18	12,83	12,64
<i>Markets & Organizations</i>	fte	2015	2016	2017
WP 1 (first flow of funds)		4,73	3,56	4,09
WP 2 (second flow of funds)		0,80	0,80	0,53
WP 3 (third flow of funds)		0,18	0,00	0,00
PhD students		2,38	1,34	1,87
Total Research staff		5,71	4,36	4,62
<i>SEO</i>	fte	2015	2016	2017
WP 1 (first flow of funds)		0,00	0,00	0,00
WP 2 (second flow of funds)		0,00	0,00	0,00
WP 3 (third flow of funds)		31,41	32,81	32,14
PhD students		0,00	0,00	0,00
Total Research staff		31,41	32,81	32,14

As shown in table III, most faculty are in the ranks of full professor and PhD student (the number of researcher (oz) fte is highest, but the majority are working at SEO Economic Research). Overall there seems to be a healthy mix of researchers in different stages of their career, although the numbers of associate professors and postdoctoral researchers are low. In 2017 the ASE welcomed a relatively high number of guests.

Table III: Ranks at programme level

<i>Research programme</i>	<i>Hgl</i>		<i>Uhd</i>		<i>Ud</i>		<i>Oz</i>		<i>Pdoc</i>		<i>PhD</i>		<i>Guest</i>		<i>Total</i>	
	<i>#</i>	<i>fte</i>	<i>#</i>	<i>fte</i>	<i>#</i>	<i>fte</i>	<i>#</i>	<i>fte</i>	<i>#</i>	<i>fte</i>	<i>#</i>	<i>fte</i>	<i>#</i>	<i>fte</i>	<i>#</i>	<i>fte</i>
UvA- Econometrics	2	1,10	3	0,44	3	1,00	0	0,00	0	0,00	2	1,60	2	0,00	12	4,14
Equilibrium, expectations & dynamics	5	1,87	3	0,87	2	0,30	0	0,00	3	2,13	8	3,74	13	0,00	34	8,91
Actuarial science	3	1,10	0	0,00	6	2,01	0	0,00	0	0,00	3	1,87	7	0,00	19	4,98
MInt	8	2,53	0	0,00	5	1,55	0	0,00	2	0,63	7	3,15	12	0,00	34	7,86
Human Capital	5	2,24	0	0,00	2	0,93	4	2,97	0	0,00	3	0,94	3	0,00	17	7,08
Experimental & political economics	6	2,09	2	1,60	4	1,23	2	1,19	2	1,60	8	4,93	1	0,00	25	12,64
Markets & Organizations	4	0,75	1	0,67	5	1,33	0	0,00	0	0,00	3	1,87	0	0,00	13	4,62
SEO economic research	2	1,86	0	0,00	0	0,00	39	30,28	0	0,00	0	0,00	0	0,00	41	32,14
Total	35	13,54	9	3,58	27	8,24	45	34,44	7	4,36	34	18,36	38	0,00	195	82,52

* hgl=professor, uhd=associate professor, ud=assistant professor, oz=researcher, pdoc=postdoctoral fellow

2.2 RESOURCES, FUNDING AND FACILITIES

A substantial part of the faculty's research budget is spent on the Tinbergen Institute, where it is used to cover the expenses of the MPhil programme, courses for both MPhil and PhD students and the organisation of seminars. Another large part of the budget concerns funding of the research priority area 'Behavioural Economics'.

Furthermore, the sections of ASE are allocated a budget for matching and a budget for its research programmes. Currently the entire research budget of the faculty of the first category of funds is a lump sum determined by the university based on Bachelor and Master diplomas and on the number of completed PhD theses. It is divided between the sections hosting the research programmes based on their number of completed PhD theses and on research time allocated to their individual researchers. The budget allocated to the programmes can be used for the funding of research fte's and for any research related activities of programme members, such as visiting conferences, conducting experiments and collecting data.

CHAPTER 3: RESULTS

3.1 PROCESSES IN RESEARCH, INTERNAL AND EXTERNAL COLLABORATION

Actual research management takes place within the research programmes. Decisions on research strategies, research topics, joint work, participation in international networks and publication outlets are all taken within these programmes, sometimes by the programme leader, but mostly in an informal way by direct communication and interaction within these groups. Research groups are typically small and interaction is frequent, direct and effective.

As explained in previous chapters, ASE-RI allocates resources based on past performance. ASE-RI stimulates and facilitates application for external funding (NWO, KNAW, EU). In general, the research institute tries to stimulate an active research environment, and it tries to assist programme members, when necessary, by providing them with information and administrative support. The overall quality of the various seminar series is good. Especially in the Tinbergen Institute series foreign speakers are usually invited and the debates are lively.

Box I: Seminar series organised in co-operation with ASE-RI

Tinbergen Institute / CREED Seminars Series

Organisation: Jeroen van de Ven and Joël van der Weele

Tinbergen Institute Econometrics Seminars & Workshops Series

Organisation: Frank Kleibergen and Julia Schaumburg

Tinbergen Institute Organizations & Markets Double Seminars

Organisation: Sander Onderstal and Jose L. Moraga-Gonzalez

Tinbergen Institute Macro Seminars

Organisation: Christian Stoltenberg, Marcelo Zouain Pedroni and Björn Brügemann

Tinbergen Institute Complexity in Economics Seminar Series

Organisation: Anita Kopányi-Peuker

ASMF Seminar Series

Organisation: Umut Can and Roger Laeven

MIInt PhD Lunch seminar series

Organisation: Oana Furtuna

Another way in which ASE-RI creates a stimulating research environment is by participating in the Tinbergen Institute (TI). Two other Dutch universities (Erasmus University and VU University) participate in the TI. It is their joint graduate school which facilitates exchange amongst its fellows (top researchers of the three participating faculties) by hosting seminar series and publishing a discussion paper series.

3.2 PHD PROGRAMME

The PhD programme of ASE-RI is organised by the graduate school in Economics, Econometrics and Finance of the Tinbergen Institute (TI). It involves completing TI's 2-year MPhil research master

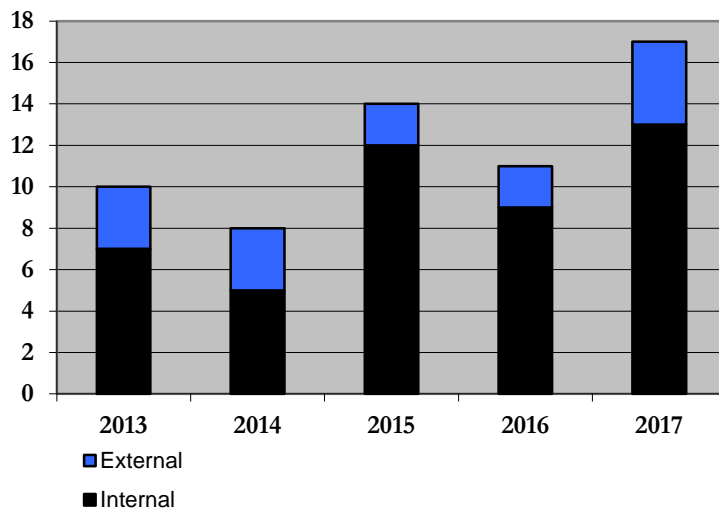
programme before the start of the PhD appointment, a process of matching and selection during the second year of the MPhil programme, a three-year appointment as PhD student at one of the three participating universities, and (for those students who aim for an academic career after graduation) preparation for the international academic job market. The advantage of this system is that it offers students an excellent research-oriented two-year programme with good opportunities to meet top-level supervisors (TI-fellows).

Table IV: PhD Inflow 2013-2017

Cohort	2013	2014	2015	2016	2017
1st flow of fund projects	11	5	6	5,5	7
2nd flow of fund projects	0	2	1	1,5	2
3rd flow of fund projects	2	1	0	0	0
Total projects started	13	8	7	7	9

The inflow of PhD students was relatively high until 2013 and stabilized around 8 in the years thereafter. In recent years the outflow of students from the Tinbergen Institute who completed their MPhil was sufficient to fill in all PhD vacancies. As can be seen in Table IV, most PhD projects concern the first flow of fund.

Figure II: Dissertations 2013-2017



After a relatively low number of dissertations in 2013 and 2014, the number increased to 17 in 2017. It is expected that the number will be around the average level of the last 3 years, in the years to come.

Table V: PhD completion rates

Cohort	2009		2010		2011		2012		2013	
	#	%	#	%	#	%	#	%	#	%
PhD students started (1st-3rd flow of fund)	9	100	5	100	12	100	15	100	13	100
Graduated	8	89	5	100	11	92	11	73	11	85
within 60 months	6	67	4	80	10	83	9	60	11	85
within 48 months	5	56	0	0	4	33	3	20	9	69
Average duration (months)	52		54		51		53		45	

Although the completion rates vary over the years, it is remarkable that the percentage of PhD projects completed within 5 years has decreased overall. More recent experience substantiates the claim that as the proportion of PhD students following the TI programme increases, the percentage of students finishing within 4 years will increase further. This can be partly explained by the fact that such students only have a salaried position for three years, as opposed to the four-year positions in the past and in the second/third flow of fund. Furthermore, students entering such four year positions typically lack a research master background, and therefore have to complete a substantial amount of coursework in the first year of their PhD appointment. By contrast, the writing of an MPhil thesis, which typically will end up in the PhD thesis as a first chapter, gives MPhil graduates a head start. Most importantly, however, students who have completed the MPhil programme have been pre-selected based on academic talent and motivation, and have been exposed for two years to a peer group of similarly ambitious and talented students. It is clear that this peer group is increasingly focused on the academic job market, and hence on producing a single-authored job market paper within a period of two years after starting the PhD project, which, in combination with the factors mentioned earlier, will lead to improving PhD completion rates.

Table VI: PhD placement

Year of dissertation	Top academic or high-profile international organisation	
	#	%
2012	11	61
2013	3	38
2014	3	60
2015	7	54
2016	3	27
2017	6	46

Students with an ambition to develop a career in academia after finishing their PhD are actively encouraged to participate in TI's job market preparation programme. This involves, among other things, feedback to improve the CV and reference letters, and mock job seminars and interviews to prepare for the American academic job market. In contrast with common practice up to a decade ago, in general ASE does not select tenure track candidates from its own pool of graduated PhD students. The group of PhD students that enter the programme through TI's MPhil programme is increasingly oriented towards the academic job market. Out of the 6 ASE-RI students who defended their PhD thesis in 2017, 46% of the initial placement was at a university from the top 200 of the QS ranking in the subject category Economics & Econometrics or a high-profile international organisation such as the International Monetary Fund.

3.3 RESEARCH OUTPUT

Figure II: Scientific output 2012-2017

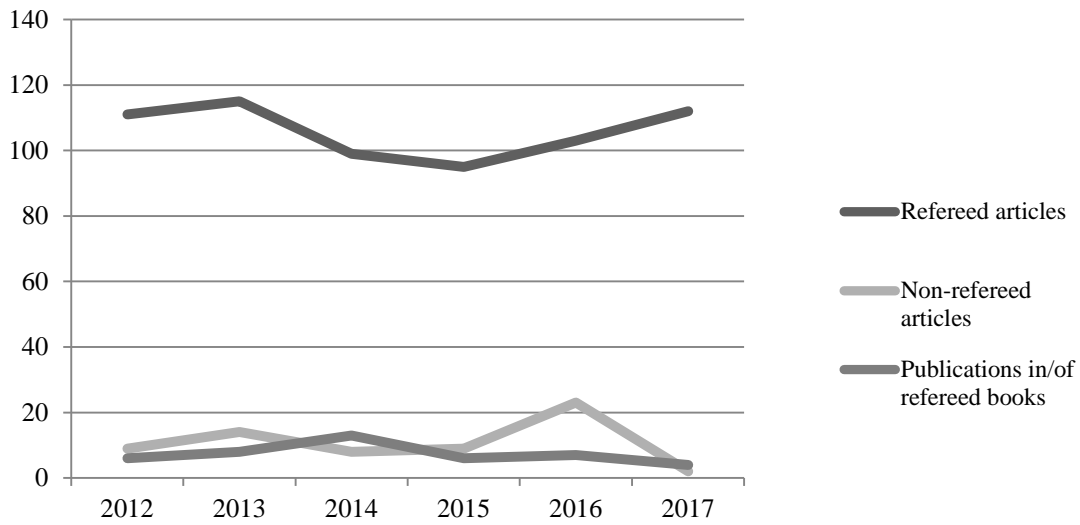


Figure II shows that after a decrease in 2014 and 2015, the scientific output increased again in 2016 and 2017. From table 1 it can be seen that the research input (fte's) decreased in 2016 and 2017. As a result, the scientific output per research fte increased in those years. The number of refereed publications per research fte excluding PhD students increased from 1,10 in 2015, to 1,20 in 2016 and 1,36 in 2017.

Table VII: Research output 2017

		UvA-e	EED	AS&MF	MInt	HUM	EPE	M&O	SEO	Total*
Articles in journals	refereed	6	16	16	14	7	32	13	14	112
	non-refereed	0	0	0	0	1	0	0	1	2
	professional	0	0	1	4	0	0	0	24	29
	popular	0	0	0	11	0	0	0	10	21
Books or book chapters	refereed	1	1	0	0	0	1	0	1	4
	non-refereed	0	0	0	0	0	0	0	0	0
	professional	0	0	0	0	0	1	1	0	1
	popular	0	0	0	0	0	0	0	0	0
Conference proceedings	non-refereed	0	0	0	0	0	1	0	0	1
Reports	non-refereed	0	0	1	8	0	0	0	56	65
PhD theses		1	4	2	5	1	2	2	0	16

* Duplications removed

See table VII for an overview of the output of the research groups. ASE-RI aims to increase the quantity and quality of its publications, in particular in refereed journals. For this purpose, publications are graded by the quality level of the journals. Based on the Article Influence Percentile

Score, top publications can be distinguished.¹ Table VIII shows that except for 2016, the number of publications in top-refereed journals is slightly lower than publications in other journals. The number of top publications per research fte excluding PhD students (see table I for data on research input) was 0,51 in 2015, increased to 0,66 in 2016 and then decreased slightly to 0,64 in 2017.

Table VII: Refereed articles 2015-2017

	2015		2016		2017	
	Top	Other	Top	Other	Top	Other
UvA-Econometrics	3	2	4	4	1	5
Equilibrium, Expectations and Dynamics	1	9	5	6	8	8
Actuarial Science & Mathematical Finance	2	11	2	9	3	13
Macro and International Economics	8	5	9	6	2	12
Human Capital	2	3	6	1	6	1
Experimental & Political Economics	18	7	22	5	23	9
Markets & Organizations	6	2	9	5	10	3
SEO	4	12	2	11	4	10
Total ASE-RI*						
	(#)	44	51	57	46	53
	(%)	46	54	55	45	53

*duplications removed

3.4 ACADEMIC REPUTATION

The 2017 QS World University Rankings by Subject puts the UvA in 1st rank in the Netherlands and 42nd worldwide for the discipline Economics and Econometrics.² In the most recent Tilburg University Top 100 of Economics Schools Research Ranking (2016) the Faculty of Economics and Business was ranked 3rd in the Netherlands and 37th worldwide.³ In the ESB Economen-top 40 of 2017, UvA ranked 5th in the Netherlands and two ASE researchers, Hessel Oosterbeek and Thomas Buser, ranked 2nd and 3rd in the individual ranking⁴.

3.5 RELEVANCE TO SOCIETY

Although the main aim of ASE-RI is to let its research contribute to the international academic discourse, most research done within ASE-RI programmes contributes in several ways to society at large. Some examples are given here but more detailed information can be found in the programme sections in part B of this report.

The Human Capital Research Programme participates in TIER, an inter-university top Institute that conducts research in the field of evidence based education. The Top Institute wants to develop knowledge of 'evidence based education' that can be utilised by: 1) the Ministry of Education, Culture and Science in policy preparation and evaluation; 2) the educational practice – for example in educational institutions – in the allocation of resources and in the decision making process when

¹ All journals with an Article Influence percentile score of ≥ 80 are considered to be 'top'. A journal's Article Influence score is a measure of the average influence of each of its articles over the first five years after publication. Scores are based on www.eigenfactor.org.

² <https://www.topuniversities.com/university-rankings/university-subject-rankings/2017/economics-econometrics>.

³ <https://econtop.uvt.nl/rankinglist.php>.

⁴ <https://esb.nu/esb/20036194/economentop-40-2017>.

choosing between educational theories; and 3) parents and students when choosing a school or training.

Researchers from the programmes Macro and International Economics and Actuarial Science & Mathematical Finance have strong ties with NETSPAR (network for studies on pensions, aging and retirement) and their research results will strongly impact the ways in which government and society will deal with the problems in these areas. In 2012 the Chair in Pension Economics was established, sponsored by MN.

SEO Economic Research carries out contract research for ministries and public organisations, private companies and non-profit institutions, nationally and internationally. SEO distinguishes itself from other research bureaus by its analytical approach. Modern economic analysis is applied to practical issues. Empirical questions are tackled with the econometrics toolkit.

CHAPTER 4: RESEARCH PRIORITY AREA: BEHAVIOURAL ECONOMICS

4.1 BACKGROUND

The Research Priority Area Behavioural Economics aims to improve our understanding of economic behaviour and decision making, with effective applications in governance, institutional arrangements and policy. It seeks to integrate into traditional economic theory insights from cognitive science, sociology and (neuro)biology. Going beyond traditional economic theories that assume rationality and narrow self-interest, RPA-BE (i) takes seriously social preferences, emotions and bounded rationality, using (ii) the methodological rigour developed in the economic sciences, including its experimental methods, econometric techniques and (game) theoretic modelling.



Research in Behavioural Economics has a strong empirical foundation; data are gathered in laboratory or field experiments. The Research Priority Area therefore invests in facilities and funding for laboratory and field-experimental research, and organizes internal seminars in which researchers comment on each other's plans (compulsory for funding), annual workshops, and international visits from or to co-authors. The Research Priority Area plays an active role in the dissemination of knowledge on behavioural economics.

Our research is mostly published in journals that are considered top in the field of Behavioral Economics (Experimental Economics, Games and Economic Behavior, Journal of Economic Theory, Journal of Economic Dynamics and Control, Management Science) and sometimes in top general audience economics journals, such as American Economic Review and Quarterly Journal of Economics. Fitting our aim to facilitate and promote interdisciplinary out-reach, our work is also published in top-rated journals in adjacent disciplines (e.g., Journal of Personality and Social Psychology, Psychological Bulletin, Journal of Theoretical Biology). A remarkable trend is the sharp increase in publications in top general science journals such as Science and Proceedings of National Academy of Sciences (9x in 2012-2016, only 2x in all years before 2012).

4.2 ORGANISATION

After its major success in 2014, when the Research Priority Area Behavioural Economics succeeded in acquiring (ongoing) Additional Funding of 301K euro per year on the basis of the grant proposal "Communication by Action and Market Design", it was again successful in 2015, and acquired an (again ongoing) grant similar in size on the basis of the proposal "Complex Human System Labs".

In 2017, a state-of-the-art communication and market design laboratory was constructed, consisting of 16 closed cubicles that allows us to systematically study distinct forms of communication (e.g., tacit cues; implicit emotional signals; promises and threats; verbal information exchange). In 2017, we have also built a complex human systems lab that provides an infrastructure for an internationally competitive laboratory to conduct experiments to simultaneously study individual micro interactions and aggregate macro behavior in large complex social-economic systems. We expect these new facilities to serve as a magnet for academics to seek collaboration with our Research Priority Area researchers.

CHAPTER 5: RESEARCH FOCAL AREA: RISK AND MACRO FINANCE

5.1 BACKGROUND

Economics and Business at the University of Amsterdam has defined Risk and Macro Finance as a key research theme (“research focal area” - RFA), seen as a convergence and integration of methodologies to develop a more insightful view of recessions, financial crises and systemic risk. Such cross-disciplinary research is much-needed to adequately respond to some of the most fundamental economic problems of our times: (i) endogenous risk creation, feedback effects, interconnectedness of financial markets and institutions, and tail risks; (ii) the relation between government finances and the financial sector; (iii) the financing of long-term guarantees and investments in insurance and pensions and the link to the macro economy; and (iv) the regulation of the broader financial sector, including shadow banking and (re)insurance. The initiative is the first of its kind in Europe. It pursues top-quality academic research, but also aims at facilitating policy and practice. The initiative is broadly supported by the Amsterdam Business School and the Amsterdam School of Economics.

ACRM’s website <http://www.acrm.uva.nl> contains further details about its activities.

5.2 ACTIVITIES

The Amsterdam Center of Excellence in Risk and Macro Finance (ACRM) hosting the activities of the Risk and Macro Finance research focal area of the University of Amsterdam's Faculty of Economics and Business, and directed by Prof. Roger Laeven, Prof. Enrico Perotti and Prof. Sweder van Wijnbergen, has seen a very successful fourth year, in which it has further expanded the intensity and impact of its research activities.



Its main activities and successes in 2017 include:

1. ACRM has organized a policy oriented meeting on the Evaluation of European Insurance Regulation Solvency II (September 15, 2017), featuring distinguished academics, practitioners, regulators and policymakers from the DNB, Dutch Association of Insurers, UniMaas, Univé and UvA.
2. ACRM has organized the Risk and Macro Finance seminar series on academic top-level research overlapping the areas of macroeconomics, finance and risk management. Featured speakers include top academics from Chicago Booth, Berkeley-Haas, Harvard, HEC Paris, LBS, Washington University in St. Louis, NYU Stern, and Stanford GSB.
3. ACRM has successfully completed its postdoc and PhD selection process and has been funding another ACRM postdoc and another ACRM PhD position since September 2017.
4. ACRM has awarded 12 Junior Risk and Macro Finance Fellowships 2017 to junior researchers representing the full width of Risk and Macro Finance research at the FEB and its two schools. To strengthen the senior level involvement in Risk and Macro Finance, Prof. Roel Beetsma (MINT) and Prof. Massimo Guiliodori (MINT) have been appointed (internal) Senior Risk and Macro Finance Fellow.

5. ACRM has published the fourth volume of the Risk and Macro Finance Working Paper series.
6. In 2017, the ACRM directors and junior fellows got their ACRM research accepted in top notch journals, such as the *Journal of the American Statistical Association*, *Journal of Econometrics*, *Journal of Financial Intermediation*, *Insurance: Mathematics and Economics* and *Mathematics of Operations Research*. ACRM publications are collected in the ACRM Publication Database.
7. ACRM co-director Prof. Laeven was appointed Editor of *Insurance: Mathematics and Economics* in the Summer of 2017. *Insurance: Mathematics and Economics* publishes leading research spanning all fields of actuarial science research, appears six times per year, and is the largest journal in actuarial science research in the world.
8. In 2017, ACRM co-director Prof. Sweder van Wijnbergen served as External Academic Advisor to the Dutch Central Bank (DNB).
9. ACRM co-director Prof. Enrico Perotti published an article in the Financial Times (10 July 2017). The article describes how a diverse monetary union creates benefits and costs for core and periphery countries.
10. Prof. Roger Laeven received a sponsorship by the Dutch Association of Insurers to support research related to Insurance Risk and Regulation over the period 2017-2021.
11. ACRM, the University of Amsterdam, and the Florence School of Banking and Finance offered a new two-day course focusing on financial and prudential aspects of the shadow banking and insurance sectors, with some attention to their legal underpinnings. The course took place on 30 and 31 October 2017 at the premises of the University of Amsterdam.
12. Junior Risk and Macro Finance Fellows Stephanie Chan, Alex Clymo, and Zhenzhen Fan, advised by Prof. Van Wijnbergen and Prof. Laeven were placed at Xiamen University, the University of Essex, and Nankai University.
13. In 2017, Junior Risk and Macro Finance Fellow Rob Sperna Weiland visited Princeton University and Junior Fellow Robin Doetling visited CEMFI Madrid and NYU.
14. ACRM underwent its first mid-term evaluation in the fall of 2017. It received marks “excellent” for the most substantial parts of the review (“design” and “performance”).

5.3 PUBLICATIONS (SELECTION)

Forthcoming publications

- Beetsma, Roel M.W.J., Giuliodori, Massimo, Hanson, Jesper, & De Jong, Frank C.J.M. (2018). Cross-Border Auction Cycle Effects of Sovereign Bond Issuance in the Euro Area. *Journal of Money, Credit and Banking*.
- Beetsma, Roel M.W.J., Giuliodori, Massimo, Hanson, Jesper, & Se Jong, Frank C.J.M. (2018). Bid-to-cover and yield changes around public debt auctions in the Euro Area. *Journal of Banking & Finance*, 87, 118-134.
- Bellini, Fabio, Roger J.A. Laeven & Emanuela Rosazza Gianin (2018). Robust return risk measures, *Mathematics and Financial Economics*, 12, 5-32.
- Boswijk, H. Peter, Roger J.A. Laeven & Xiye Yang (2018). Testing for self-excitation in jumps, *Journal of Econometrics*, 203, 256-266.
- Kaas, Rob, Roger J.A. Laeven, Sheldon Lin, Qihe Tang, Gordon Willmot & Hailiang Yang (2018). Editorial: IME's Editorial Board, *Insurance: Mathematics and Economics*, 78, A1-A3.
- Krätschmer, Volker, Marcel Ladkau, Roger J.A. Laeven, John G.M. Schoenmakers & Mitja Stadje (2018). Optimal stopping under uncertainty in drift and jump intensity, *Mathematics of Operations Research*.
- Martynova, Natalya & Enrico C. Perotti (2018). Convertible Bank Capital and Risk Incentives, *Journal of Financial Intermediation*.

Publications

- Aït-Sahalia, Yacine, Jianqing Fan, Roger J.A. Laeven, Christina Dan Wang & Xiye Yang (2017). Estimation of the continuous and discontinuous leverage effects, *Journal of the American Statistical Association*, 112, 1744-1758.
- Dari Mattiacci, Giuseppe, Oscar Gelderblom, Joost Jonkers and Enrico C. Perotti (2017). The Emergence of the Corporate Form, *Journal of Economics, Law and Organization*, 33, 193-236.
- Glasserman, Paul & Enrico C. Perotti (2017). The Unconvertible CoCo Bonds, In: *International Banking Conference of the Chicago Fed, Proceedings* (pp. 317-329), World Scientific Publishers.
- Homar, Timotej & Van Wijnbergen, Sweder J.G. (2017). Bank recapitalization and economic recovery after financial crises, *Journal of Financial Intermediation*, 32, 16-28.
- Kwaak, Christiaan van der, & Van Wijnbergen, Sweder J.G. (2017). Sovereign debt and bank fragility in Spain. *Review of World Economics*, 153(3), 511–543.
- Zhao, Lin, & Van Wijnbergen, Sweder J.G. (2017). Decision Making in Incomplete Markets with Ambiguity: A case study of a gas field acquisition. *Quantitative Finance*, 17(11), 1759-1782.

PhD theses

- Chan, Stephanie (2017). *Wake Me Up Before You CoCo: Implications of contingent convertible capital for financial regulation*. [ACRM junior fellow. Promotor: Prof. Sweder J. G. van Wijnbergen.]
- Fan, Zhenzhen (2017). *Essays on International Portfolio Choice and Asset Pricing under Financial Contagion*. [ACRM junior fellow. Promotor: Prof. Roger J. A. Laeven.]
- Van der Kwaak, Christiaan G. F. (2017). *The macroeconomics of banking*. [ACRM junior fellow. Promotor: Prof. Sweder J. G. van Wijnbergen.]

Policy publications

- Beetsma, Roel M. W. J., & Van Wijnbergen, Sweder J.G. (2017). Globalisering vereist meer vormen voor arbeidscontract. *Financieel dagblad*.
- Beetsma, Roel M.W.J., & Van Wijnbergen, Sweder J.G. (2017). Oplossing van pensioenvraagstuk is niet mogelijk zonder duidelijke keuzes. *Financieel dagblad*.
- Dari Mattiacci, Giuseppe, & Perotti, Enrico C. (2017). Trade, Political Institutions and Legal Innovation: the Birth of the Corporation in Amsterdam. In: *The Long Economic and Political Shadow of History*, VOXEU e-book.
- Perotti, Enrico C. (2017). Banking union success can be replicated on the fiscal front, *Financial Times*, July 10, 2017.

B

THE RESEARCH PROGRAMMES

6. UvA-ECONOMETRICS

Programme director: Prof. dr. F.R. Kleibergen
 Section: Quantitative Economics
 JEL-classification: C1, C2, C3, C4, C5
 Starting date: 1997
 Website: www.ase.uva.nl/uva-econometrics

6.1 MEMBERS OF THE RESEARCH GROUP AND RESEARCH IN FTES

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Aristodemou, E.	dr.	ud	-	0,50	0,50	1
Boswijk, H.P	prof. dr.	hgl	0,50	0,50	0,50	1
Broda, S.A.	dr.	ud	0,50	0,50	0,50	1
Bun, M.	dr.	uhd	0,80	0,20	-	2
Bun, M.	dr.	uhd	-	0,33	0,11	1
Çakmaklı, C.	msc	guest	0,00	-	-	1
Garderen, K.J. van	dr.	uhd	0,19	0,04	0,00	1
Giersbergen, N.P.A. van	dr.	ud	0,21	0,08	0,00	1
Gooijer, J.G. de	prof. dr.	guest	0,00	0,00	0,00	1
Juodis, A.	msc	phd	0,73	-	-	2
Kiviet, J.F.	prof. dr.	guest	0,00	0,00	0,00	1
Kleibergen, F.R.	prof. dr.	hgl	0,60	0,60	0,60	1
Kong, L.	msc	phd	-	0,27	0,80	1
Liu, Y.	msc	phd	0,80	0,27	-	1
Ophem, J.C.M. van	dr.	uhd	0,25	0,25	0,33	1
Pleus, M.	msc	phd	0,40	-	-	2
Poldermans, R.	msc	phd	0,40	-	-	2
Poldermans, R.	msc	phd	-	0,00	-	1
Stephan, S.	msc	phd	-	-	0,80	1
Total 1st flow of funds			3,05	3,34	4,14	
Total 2nd flow of funds			2,33	0,20	0,00	
Total 3rd flow of funds			0,00	0,00	0,00	
Total 1st f.o.f. excl. PhD			2,25	2,80	2,54	
Total 1st-3rd flow of funds			5,38	3,54	4,14	
PhD students			2,33	0,54	1,60	

6.2 PROGRAMME DESIGN

Objective

The UvA-Econometrics programme aims at improving the accuracy, efficiency and robustness of econometric inference methods.

Motivation

Empirical economic data are usually not obtained from markets or agents in static equilibrium. Typically they provide a random and disturbed indication at a certain moment in time, or over a relatively short period, of dynamic jointly dependent adjustment processes. Also they usually concern just a few aspects of the underlying complex (non-) linear economic system.

The various projects united in this programme all try to gear statistical techniques to the typical characteristics of empirical economic data. The main interest is the development of accurate and efficient econometric inference to test economic theory, to support decision making and for policy evaluation.

Techniques

Both analytic and experimental methods are used in this programme to improve understanding of the available statistical inference techniques, and to develop alternatives. The analytic aspects often involve the derivation of asymptotic distributions, the approximation of finite sample moments or distribution functions, the elimination of nuisance parameters etc. In computer simulations of completely specified systems the existing standard procedures and the newly developed techniques are then compared and evaluated experimentally. Occasionally the alternative techniques as such are of an experimental nature, because they involve computer-intensive methods (bootstrap resampling, randomization techniques, simulation-based inference). Actual data often serve to illustrate the empirical relevance and practical usefulness of the theoretical findings, but at times empirical issues are the prime motivation of the research projects engaged in.

Applications

The fundamental problems of econometrics indicated above are studied in interplay with actual applied econometric research. These applications come from economics, finance or business. We do not intend to provide an exhaustive overview of specific applications, but UvA-Econometrics is active in labour economics (wage determination, job mobility and allocation, returns to schooling), development economics (exports and productivity, infant mortality), health economics (organization of health care, intelligence and mortality), finance (measurement and modelling of stock return volatility, option pricing, credit risk, risk premia), international economics (effects of trade policy and economic integration), monetary economics (demand for money, term structure of interest rates) and business (marketing activities). The economic behaviour of individual agents is analysed on the basis of observational or experimental data of various dimensions (cross-section, time series or panel data).

Sub-themes

Within the general programme described above, the following sub-themes can be distinguished:

Econometric Theory

Within this sub-theme, analytical finite sample approximations, simulation-based inference, inference based on IV/GMM with weak instruments, conditional inference, methods from differential geometry as well as semi- and non-parametric methods are studied for and applied in models that may be dynamic, simultaneous or non-linear.

Microeconometrics

Econometric analyses within this sub-theme often entail a quantitative assessment of the effectiveness of a policy intervention. Outside controlled experiments policies are usually endogenous. Unbiased assessment of effectiveness requires adequate modelling of the causality, handling of any unobserved heterogeneity and understanding of the identification issues. Applications within this sub-theme often include panel data, which calls for the development of accurate inference methods for dynamic panel data models.

Financial Econometrics

Topics are ARCH and stochastic volatility models, the econometrics of the CAPM and factor models, econometric models of the term structure of interest rates, econometric analysis of credit risk, the analysis of option data and implied volatilities, and the analysis of high-frequency data and realized volatility. Applications within this sub-theme often include non-stationary data. This leads to the analysis of unit roots, cointegration and error correction models, the role of (weak) exogeneity in such models and structural change.

6.3 PROGRAMME EVALUATION

The output of the research group is not appropriately spread over its members since it primarily results from a smaller sub group. We expect that the new tenure tracker increases the research output.

Almost weekly, a Friday afternoon (mostly external) seminar is organised at (and funded by) the Tinbergen Institute, jointly with econometricians from VU University Amsterdam. It is an active seminar series, with high-quality international speakers. In addition, occasionally an internal informal workshop is held on Thursdays at lunch time, where research projects which are still in an early stage are discussed. These meetings stimulate the coherence of the research programme and should lead to more joint research projects; however, their frequency has recently declined, which is a point for concern. All activities and achievements of UvA-Econometrics are communicated via its web-site (www.ase.uva.nl/uva-econometrics).

It is the ambition of UvA-Econometrics to gain further recognition as one of the major strongholds in theoretical econometrics. The activities and achievements over the last decade (number and quality of publications, presentations at and invitations for international meetings, responsibilities regarding journals and conferences, hosting of visiting scholars, exposure at peer institutions, etc.) have been substantial, but leave room for further qualitative and quantitative improvements. In particular, the continued high teaching loads in the group have had a negative impact on the research output of some of its members, and consequently on the research time available to the programme. Most individual members of UvA-Econometrics continue to operate in intensive formal and informal national and international networks. As part of a strategy for improvement of research output, UvA-Econometrics continues to aim at strengthening its ties with other faculty research programmes, in the form of joint applied research projects in micro-econometrics and financial econometrics.

There are currently two PhD students: Lingwei Kong and Sanna Stephan. Two more will start in September 2018 and there is room for more PhD students.

The above evaluation can be summarized in the following SWOT analysis regarding the activities and current position of UvA-Econometrics:

Strengths: good reputation; a relatively steady stream of publications; quality of human capital; expertise in a broad range of cutting edge areas of econometric (and statistical) theory; recently improved prospects regarding external funding; coherence of and atmosphere within the group; active seminar and workshop series; exposure via own discussion paper series; tight but appropriate facilities regarding computing and travel.

Weaknesses: relatively few links with other units of the FEB outside the quantitative economics research groups; only a small number of its members regularly publish in A-journals. One senior member of the group Maurice Bun has largely left for the DNB. One new tenure tracker Bart Keijsers from EUR has been hired but there is one more vacancy. It is hard to attract tenure trackers from the job market given the not very competitive offers we can make.

Opportunities: recently developed MPhil programme and Fast Track in Econometrics within the Tinbergen Institute; developing a more applied profile within ASE and with the ABS.

Threats: decreased research input due to small number of faculty members that publish regularly. This has led to a high teaching load for some senior faculty members which leaves them little room to conduct research. Some senior member therefore decided to leave and it is not ruled out that others will follow. To counter this a new initiative has been made by ASE-RI to temporarily award research time to those with currently don't have any based on a research proposal.

6.4 RESOURCES AND FUNDING

The current ASE-RI facilities allow the active researchers (and also first and second year PhD students) to attend at least one international conference per year; in practice more is possible, so the research group does not experience binding constraints in this respect.

In recent years, UvA-Econometrics has been quite successful in obtaining external funding for research activities. To maintain a good research environment and attract more PhD students, it is important that UvA-Econometrics remains successful in obtaining external funding.

6.5 OUTPUT

Key publications

- Boswijk, H.P., Jansson, M. & Nielsen, M.Ø. (2015). Improved likelihood ratio tests for cointegration rank in the VAR model. *Journal of Econometrics*, 184 (1), 97–110.
- Boswijk, H.P., G. Cavaliere, A. Rahbek and A.M. Taylor (2016), Inference on co-integration parameters in heteroskedastic vector autoregressions. *Journal of Econometrics*, 192 (1), 64–85.
- Broda, S.A., Haas, M., Krause, J., Paoletta, M., & Steude, S. (2013). A mix-stable GARCH model. *Journal of Econometrics* 172, 292–306.
- Guggenberger, P., Kleibergen, F., Mavroeidis, S. & Chen, L. (2012). On the asymptotic sizes of subset Anderson-Rubin and Lagrange multiplier tests in linear instrumental variables regression. *Econometrica* 80, 2649–2666.
- Kiviet, J.F. (2013). Identification and inference in a simultaneous equation under alternative information sets and sampling schemes. *Econometrics Journal* 16, S24–S59.
- Kleibergen, F.R. and Z. Zhan (2015). Unexplained factors and their effects on second pass R-squared's. *Journal of Econometrics*, 189, 101-116.

Forthcoming

- Kiviet, J. F. & Chen, Z. A critical appraisal of studies analyzing co-movement of international stock markets with a focus on East-Asian indices. *Annals of Economics and Finance*.
- Kleibergen, F. & Zhan, Z. (2018) Identification robust inference on risk premia of mimicking portfolios of non-traded factors. *Journal of Financial Econometrics*. 16, 155-190.

E-publication ahead of print

- Garderen, K.J. van, & Sowell, F. (2017). MULTIMODALITY p**-FORMULA AND CONFIDENCE REGIONS. *Econometric Theory*, 1-31.

Publications in numbers

Output type	Classification	#
Articles in journals	Refereed	6
	Non-refereed	0
	Professional	0
	Popular	0
Books or book chapters	Refereed	1
	Non-refereed	0
	Professional	0
	Popular	0
Conference proceeding		0
PhD theses		1
Total		8

Article in journal – refereed

- Boswijk, H. P., & Paruolo, P. (2017). Likelihood ratio tests of restrictions on common trends loading matrices in I(2) VAR systems. *Econometrics*, 5(3), [28].
- Brals, D., Aderibigbe, S. A., Wit, F. W., van Ophem, J. C. M., van der List, M., Osagbemi, G. K., ... Schultz, C. (2017). The effect of health insurance and health facility-upgrades on hospital deliveries in rural Nigeria: a controlled interrupted time-serie study. *Health Policy and Planning*, 32(7), 990-1001.
- Kiviet, J. F. (2017). Discriminating between (in)valid external instruments and (in)valid exclusion restrictions. *Journal of Econometric Methods*, 6(1).
- Kiviet, J. F., & Pleus, M. (2017). The performance of tests on endogeneity of subsets of explanatory variables scanned by simulation. *Econometrics and Statistics*, 2, 1-21.
- Kiviet, J. F., Pleus, M., & Poldermans, R. W. (2017). Accuracy and Efficiency of Various GMM Inference Techniques in Dynamic Micro Panel Data Models. *Econometrics*, 5(1), [14].
- Zu, Y., & Boswijk, H. P. (2017). Consistent nonparametric specification tests for stochastic volatility models based on the return distribution. *Journal of Empirical Finance*, 41, 53-75.

Book – refereed

- Gooijer, J. G. de (2017). Elements of Nonlinear Time Series Analysis and Forecasting. (Springer series in statistics). Cham: Springer.

Dissertation – internally prepared

- Poldermans, R. W. (2017). Accuracy of method of moments based inference.

Talk or presentation

- Aristodemou, E. (Speaker), Semiparametric Identification in Panel Data Discrete Response Models, International Panel Data Conference, 7-8 July 2017.
- Aristodemou, E. (Speaker), Semiparametric Identification in Panel Data Discrete Response Models, Rijksuniversiteit Groningen, 29 November 2017.
- Aristodemou, E. (Speaker), Semiparametric Identification in Panel Data Discrete Response Models, European Winter Meetings of the Econometric Society, 12 December 2017.
- Garderen, K. J. van (Invited speaker), Confidence Regions and Approximated Multimodal Distributions, University of Bielefeld, 9 May 2017.
- Garderen, K. J. van (Speaker), Confidence Regions for Spatial Autoregressive Models, Inference Issues in Econometrics, Amsterdam, 19 May 2017.

7. EQUILIBRIUM, EXPECTATIONS & DYNAMICS

Subprogrammes:	EU FP7 Integrated Macro-Finance Modelling for Robust Policy Design (MACFINROBODS); EU Horizon 2020, Bridging the gap: from Individual Behaviour to the Socio-technical MaN (IBSEN); Institute of New Economic Thinking (INET), Heterogeneous Expectations and Financial Crises (HexFiCs); Marie Curie Innovative Training Network, Expectations and Social Influence Dynamics in Economics (ExSIDE). NWO ORA Behavioral and Experimental Analysis in Macro-Finance
Programme director:	Prof. dr. C.G.H. Diks
Section:	Quantitative Economics
JEL-Classification:	C, D, E6
Starting date:	1998
Website:	http://cendef.uva.nl

7.1 MEMBERS OF THE RESEARCH GROUP AND RESEARCH IN FTES

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Altaghlibi, M.	msc	guest	0,00	0,00	0,00	1
Amman, H.M.	prof. dr.	hgl	0,00	0,00	0,00	1
Assenza, T.	dr.	postdoc	0,16	-	-	1
Cafferata, A.	msc	guest	-	-	0,00	1
Diks, C. (CeNDEF)	prof. dr.	hgl	0,50	0,50	0,50	1
Fang, H.	msc	phd	0,80	0,80	0,53	1
Goy, G.	msc	phd	-	0,27	0,80	1
Hennequin, M.	msc	phd	0,27	0,80	0,80	1
Hommel, C.H. (CeNDEF)	prof. dr.	hgl	0,50	0,50	0,56	1
Hommel, C.H. (CeNDEF)	prof. dr.	hgl	0,35	0,35	0,10	2
Huang, Z.	dr.	guest	0,00	-	-	1
Huber, S.	dr.	ud	-	-	0,17	1
Jong, J. de	msc	phd	-	-	0,27	1
Kopányi, D.	dr.	postdoc	-	0,27	0,80	2
Kopányi-Peuker, A.	dr.	postdoc	0,27	0,80	0,80	2
Koster, M.A.L.	dr.	uhd	0,13	0,08	0,00	1
Leij, M. van der	dr.	ud	0,50	0,50	0,13	1
Leij, M. van der	dr.	uhd	-	-	0,37	1
Leur, M. van de	msc	guest	0,00	-	-	1
Levelt, E.	msc	phd	-	-	0,27	1
Li, H.	msc	guest	0,00	0,00	0,00	1
Linardi, F.	msc	guest	-	0,00	0,00	1
Lustenhouwer, J.	msc	phd	0,80	0,80	0,53	2
Makarewicz, T.	dr.	postdoc	0,80	0,53	0,53	2
Makarewicz, T.	dr.	postdoc	0,80	0,27	-	1
Meertens, Q.	msc	guest	-	0,00	0,00	1
Mohammadian Moghayer, S.	dr.	guest	-	0,00	0,00	1
Negriu, A.	msc	phd	0,60	-	-	1
Negriu, A.	msc	guest	-	0,00	-	1

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Ozden, T.	msc	phd	-	-	0,27	1
Ramer, R.	dr.	guest	0,00	0,00	0,00	1
Ruiter, A.	drs.	guest	-	0,00	0,00	1
Salle, I.	dr.	postdoc	0,80	0,20	-	2
Salle, I.	dr.	guest	-	-	0,00	1
Silva, E.	msc	guest	-	-	0,00	1
Sloot, P.	prof. dr.	hgl	-	0,07	0,21	1
Sniekers, F.	msc	guest	0,00	0,00	-	1
Stephan, S.	msc	phd	-	0,27	-	1
Tuinstra, J. (CeNDEF)	prof. dr.	hgl	0,50	0,50	0,50	1
Turco, E.	msc	phd	-	-	0,27	1
Veld, D. in 't	dr.	guest	0,00	0,00	-	1
Wagener, F. (CeNDEF)	dr.	uhd	0,50	0,50	0,50	1
Wang, J.	msc	guest	0,00	0,00	0,00	1
Wang, H.-S.	msc	guest	0,00	0,00	0,00	1
Wolski, M.	msc	guest	0,00	0,00	0,00	1
Zhu, M.	dr.	guest	0,00	-	-	1
Total 1st flow of funds			5,53	6,93	6,15	
Total 2nd flow of funds			1,95	1,08	2,76	
Total 3rd flow of funds			0,00	0,00	0,00	
Total 1st f.o.f. excl. PhD			3,06	2,92	2,41	
Total 1st-3rd flow of funds			7,48	8,01	8,91	
PhD students			2,47	2,94	3,74	

7.2 PROGRAMME DESIGN

The objective of the programme is the development of (mathematical) economic theory, focussing on the understanding of economic processes. The programme aims at developing models of economic behaviour in different areas of economics, including microeconomics, macroeconomics and finance. Emphasis is given to behavioural models of dynamic market phenomena.

The research group employs a multi-disciplinary approach. The models are studied both from a theoretical and a computational perspective, and the validity of the models is tested in laboratory experiments with human subjects as well as empirically using real data. The NWO-Vernieuwingsimpuls Information Flows in Financial Markets, the EU STREP project Financial Markets and Complexity and the NWO-VIDI programme *Structural Stability in Economic Dynamics* are part of the research programme.

The programme can be subdivided into five closely related and interacting research themes:

Equilibrium theory

Individual optimising behaviour of economic agents generates aggregate supply and demand of commodities, as a function of prices and individual expectations. In equilibrium supply and demand are equal. Many types of equilibrium can be studied: partial versus general, competitive versus monopolistic, dynamic versus static, temporary equilibrium, single, representative agent as well as heterogeneous, interacting agents equilibria. The existence of equilibria is studied, as well as conditions for stability or instability of dynamic adjustment processes.

Game theory & Industrial organisation

This part of the programme focuses on modelling strategic behaviour of economic agents in markets with imperfect competition, such as duopoly and oligopoly. Equilibria in non-cooperative games (e.g. duopoly, oligopoly) as well as cooperative games (costs sharing, general equilibrium) are studied. Evolutionary games with heterogeneous, boundedly rational strategies competing against each other are also studied.

Expectations and learning

Bounded rationality models of expectation formation and learning schemes are becoming a serious alternative to rational expectations, which was the dominating paradigm until quite recently. The fully rational representative agent is replaced by a large *heterogeneous* population of boundedly rational interacting agents, who form expectations based upon time series observations and update their forecasting rules according to new observations and new information about market fundamentals. Conditions under which learning schemes converge to rational expectations or to a boundedly rational expectations equilibrium with excess volatility are investigated. Formation of expectations is studied in theory, in laboratory experiments with human subjects and in real markets.

Nonlinear economic dynamics

This part of the programme focuses on nonlinear complexity models of dynamic market phenomena. Are market fluctuations mainly caused by random exogenous shocks, or can endogenous nonlinear economic laws of motion explain (a significant part of) the fluctuations? Various deterministic and stochastic economic models are studied theoretically, computationally as well as empirically, attempting to explain the most important stylised facts observed in real economic and financial time series. Emphasis is given to *complex adaptive systems* where markets consist of a large population of agents selecting simple strategies according to their relative success in the recent past. In these evolutionary adaptive systems endogenous variables such as prices and agents' beliefs co-evolve over time.

Dynamic optimisation

Emphasis is given to dynamic optimisation problems in environmental economics, characterised by a conflict between economic benefits and ecological costs. Tools from nonlinear dynamics and bifurcation theory are employed to investigate non-convex dynamic optimisation problems. The main thrust is a structural analysis, that is, investigation of the global solution structure of dynamic optimisation problems and dynamic games. The qualitative changes of these solutions are studied under changes of the parameters. Geometrical methods, like bifurcation theory, normal form theory and perturbation theory, as well as numerical methods yield insights that hold not just at isolated parameter values, but for the complete parameter set.

7.3 PROGRAMME EVALUATION

This programme grew out of a mathematical economics program Equilibrium and Dynamics, led by Weddepohl, which was quite small until the mid nineties. The group was extended considerably at the end of 1998, thanks to an NWO-MaG Pionier grant awarded to Hommes, to set up the Center for Nonlinear Dynamics in Economics and Finance (CeNDEF). At that time the program changed from a small specialized mathematical economics program into a multi-disciplinary research program with an emphasis on economic theory, but also running laboratory experiments (in cooperation with Joep Sonnemans at CREED) to test behavioural theories and doing empirical work as well (in cooperation with Peter Boswijk at UvA-Econometrics), in particular nonlinear time series analysis, to test behavioural models empirically. Weddepohl retired in 2002 while Furth and Koster joined the group in the same year; from that point onwards, game theory has been included as one of the research themes of the program. At the end of 2003, the CeNDEF postdocs Diks, Tuinstra and Wagener obtained tenured positions, ensuring the continuation of the research program.

The publication record of the year 2017 is very good. The output included 16 articles in international refereed journals, amongst which publications in the Economic Journal, the Journal of Economic

Dynamics and Control and the Journal of Economic Behavior and Organization, and, among others, a manuscript that was accepted for publication in the Journal of Business & Economic Statistics. There were three PhD students, Gregor Boehl, Joep Lustenhouwer and Moutaz Altaghlibi, that had their main supervisor from the group, who defended their thesis successfully.

The programme is internationally established, as is shown by excellent citation statistics (e.g. according to the Science Citation Index (SCI) in 2017 more than 500 citations of published work by group members), many invited and several keynote lectures at international seminars, conferences and workshops by various members of the research group. In the IDEAS/RePEc ranking of Top 20% institutes (<http://ideas.repec.org/top/top.netherlands.html>), CeNDEF ranks as number 11, two positions up from last year. This ranking contains faculties of economics and departments; among the small institutes of the order of a research group (up to 16 researchers) CeNDEF ranks 4th on the list.

In 2017, Stephanie Huber joined the group as a Tenure Tracker and Alessandro Basurto (EDEEM), Johan de Jong, Eva Levelt (ExSIDE), Tolga Ozden and Enrico Turco (ExSIDE) joined the group as PhD students.

The evaluation can be summarized in the following SWOT analysis of the CeNDEF activities.

Strengths: international reputation as an excellent research group on nonlinear dynamics and complexity applications in economics and finance, high scientific impact (e.g., with both having been cited over 500 times (Web of Science), Brock and Hommes (Econometrica 1997), and Brock and Hommes (JEDC 1998), are two of the best cited journal articles co-authored by a Dutch economist), regular international visitors, active seminars and international workshops, own working paper series, frequently visited website, good facilities for computing and travel.

Weaknesses: relatively few publications in top mainstream journals, where multi-disciplinary work and non-mainstream approach such as agent-based modelling and complexity modelling are getting accepted only slowly; the number of links with practitioners and policy makers has been relatively low, but is increasing.

Opportunities: development of UvA Graduate School in Economics; application of group-specific know-how to core economic problems, to demonstrate in this way the value of the programme's characteristic approach; developing more policy oriented research, e.g. through a new project on heterogeneous expectations in macro economics and monetary policy; for example, there are close collaborations with the UvA Institute of Advanced Study, Statistics Netherlands and with researchers and policy makers at DNB.

Threats: A multidisciplinary group is likely to be handicapped when evaluated in a mono-disciplinary environment; and the complexity of the tools used may turn out to be an impediment at disseminating the research approach.

7.4 RESOURCES AND FUNDING

The budget received from ASE-RI covers on average one conference per researcher per year. A budget of the Faculty covers some of the costs for the Economics Colloquia; another budget of the Tinbergen Institute covers the costs of joint research seminars Cooperative Behaviour, Strategic Interaction and Complex Systems - CSC together with the VU mathematical economics group.

The group has been very successful in obtaining additional external funding for individual PhD students (NWO Research Talent grants). In 2016, the NWO Ora project “Behavioural and Experimental Analysis in Macro-Finance, led by Jan Tuinstra, started. Moreover, CeNDEF is part of several European consortia that obtained grants and two INET projects, “Coordination of Expectations”, led by Roger Guesnerie and “Heterogeneous Expectations and Financial Crises”, led

by Cars Hommes. The EU FP7-SHS Collaborative project (with 12 European partners) "Integrated Macro-Financial Modelling for Robust Policy Design (MACFINROBODS)", 2014-2017, was coordinated by Cars Hommes for the UvA. Another EU Horizon 2020 project "Bridging the gap: from Individual Behaviour to the Socio-technical MaN (IBSEN)" has started in September 2015. For 2017-2020 funding has been obtained in a Marie Curie Innovative Training Network "Expectations and Social Influence Dynamics in Economics (ExSIDE)", allowing for 5 additional PhD positions (on mobility track basis) within the program from September 2017.

7.5 OUTPUT

Key publications

- Bao, T., Hommes, C., & Makarewicz, T. (2017). Bubble formation and (in)efficient markets in learning-to-forecast and optimise experiments. *Economic Journal*, 127(605), F581-F609.
- Battiston, S., Farmer, J.D., Flache, A., Garlaschelli, D., Haldane, A.G., Heesterbeek, H., Hommes, C., Jaeger, C., May, R. and Scheffer, M. (2016). Complex Systems: Complexity theory and financial regulation. *Science* 351, 818-819.
- Diks, C. and Wolski, M. (2016). Nonlinear Granger Causality: Guidelines for Multivariate Analysis. *Journal of Applied Econometrics* 31, 1333-1351.
- Dockner, E. and Wagener, F. (2014). Markov perfect Nash equilibria in models with a single capital stock. *Economic Theory* 56, 585-625.
- Hommes, C.H. and Zhu, M. (2014). Behavioral Learning Equilibria, *Journal of Economic Theory* 150, 778-814.
- Linde, J., Sonnemans, J. and Tuinstra, J. (2014). Strategies and evolution in the minority game: A multi-round strategy experiment. *Games and Economic Behavior* 86, 77-95.

Forthcoming

- Anufriev, M. and Kopanyi, D. (2018). Oligopoly Game: Price Makers Meet Price Takers, *Journal of Economic Dynamics and Control*,
- Bao, T., Diks, C., & Li, H. (2018). A generalized CAPM model with asymmetric power distributed errors with an application to portfolio construction. *Economic Modelling*, 68, 611-621.
- Cornea-Madeira, A., Hommes, C., & Massaro, D. (2018). Behavioral Heterogeneity in U.S. Inflation Dynamics. *Journal of Business & Economic Statistics*. Forthcoming, available on-line.
- Diks, C., Li, X. and Wu, C. (2018). Information cost, memory length and market instability, *Nonlinear Dynamics, Psychology, and Life Sciences*.
- Hommes, C., Lustenhouwer, J., & Mavromatis, K. (2018). Fiscal consolidations and heterogeneous expectations. *Journal of Economic Dynamics and Control*, 87, 173-205.
- Hommes, C.H. (2018), Carl's nonlinear cobweb, *Journal of Economic Dynamics and Control*.
- Hommes, C.H., Ochea, M. and Tuinstra, J. (2018). Evolutionary competition between adjustment processes in Cournot oligopoly: instabilities and complex dynamics, *Dynamic Games and Applications*.
- Leur, M. van de and Anufriev, M. (2018). Timing under individual evolutionary learning a continuous double auction, *Journal of Evolutionary Economics*.
- Roy, D., Lees, M. H., Pfeffer, K., & Sloot, P. M. A. Spatial segregation, inequality, and opportunity bias in the slums of Bengaluru. *Cities : The International Journal of Urban Policy and Planning*, 74, 269-276.
- Salle, I., Seppecher, P. and Lang, D. (2018). Is the market really a good teacher? Market selection, collective adaptation and financial instability, *Journal of Evolutionary Economics*.
- Salle, I., Senegas, M.-A., Yildizoglu, M. (2018). How transparent should a Central Bank be? An ABM assessment, *Journal of Evolutionary Economics*.

- Schmitt, N., Tuinstra, J., & Westerhoff (2018). Market Interactions, Endogenous Dynamics and Stabilization Policies, in: *The Economy as a Complex Spatial System: Macro, Meso and Micro Perspectives*, Eds. P. Commendatore et al., Springer Proceedings in Complexity, Springer, Berlin, NY.
- Schmitt, N., Tuinstra, J., & Westerhoff, F. (2018). Stability and welfare effects of profit taxes within an evolutionary market interaction model. *Review of International Economics*.
- Seppecher, P., Salle, I. And Lavoie, M. (2018). What drives markups? Evolutionary pricing in an agent-based stock-flow consistent macroeconomic model, *Industrial and Corporate Change*.

E-publication ahead of print

- Cornea-Madeira, A., Hommes, C., & Massaro, D. (2017). Behavioral Heterogeneity in U.S. Inflation Dynamics. *Journal of Business & Economic Statistics*.
- Schmitt, N., Tuinstra, J., & Westerhoff, F. (2017). Stability and welfare effects of profit taxes within an evolutionary market interaction model. *Review of International Economics*.

Publications in numbers

Output type	Classification	#
Articles in journals	Refereed	16
	Non-refereed	0
	Professional	0
Books or book chapters	Refereed	1
	Non-refereed	0
	Professional	0
Conference proceedings	Non-refereed	0
PhD theses		4
Total		21

Article in journal – refereed

- Assenza, T., Brock, W. A., & Hommes, C. H. (2017). Animal spirits, heterogeneous expectations and the amplification and duration of crises. *Economic Inquiry*, 55(1), 542-564.
- Bao, T., Hommes, C., & Makarewicz, T. (2017). Bubble formation and (in)efficient markets in learning-to-forecast and optimise experiments. *Economic Journal*, 127(605), F581-F609.
- Da Gama Batista, J., Massaro, D., Bouchaud, J. P., Challet, D., & Hommes, C. (2017). Do investors trade too much? A laboratory experiment. *Journal of Economic Behavior & Organization*, 140, 18-34.
- Diks, C., & Fang, H. (2017). Transfer Entropy for Nonparametric Granger Causality Detection: An Evaluation of Different Resampling Methods. *Entropy*, 19(7), [372].
- Graaf, C. S. L. de, Kandhai, D., & Sloot, P. M. A. (2017). Efficient Estimation of Sensitivities for Counterparty Credit Risk with the Finite Difference Monte Carlo Method. *Journal of Computational Finance*, 21(1), 83-113.
- Hinloopen, J., Smrkolj, G., & Wagener, F. (2017). Research and development cooperatives and market collusion: a global dynamic approach. *Journal of Optimization Theory and Applications*, 174(2), 567-612.
- Hommes, C., & in 't Veld, D. (2017). Booms, busts and behavioural heterogeneity in stock prices. *Journal of Economic Dynamics & Control*, 80, 101-124.
- Hommes, C., Makarewicz, T., Massaro, D., & Smits, T. (2017). Genetic algorithm learning in a New Keynesian macroeconomic setup. *Journal of Evolutionary Economics*, 27(5), 1133–1155.
- Kopányi-Peuker, A., Offerman, T., & Sloof, R. (2017). Fostering cooperation through the enhancement of own vulnerability. *Games and Economic Behavior*, 101, 273-290.
- Kopányi, D. (2017). The Coexistence of Stable Equilibria under Least Squares Learning. *Journal of Economic Behavior & Organization*, 141, 277-300.

- Koster, M., Kurz, S., Lindner, I., & Napel, S. (2017). The Prediction Value. *Social Choice and Welfare*, 48(2), 433-460.
- Papana, A., Kyrtsov, C., Kugiumtzis, D., & Diks, C. (2017). Financial networks based on Granger causality: A case study. *Physica A: Statistical Mechanics and its Applications*, 482, 65-73.
- Papana, A., Kyrtsov, C., Kugiumtzis, D., & Diks, C. (2017). Assessment of Resampling Methods for Causality Testing: A note on the US Inflation Behavior. *PLoS One*, 12(7), [e0180852].
- Roy, D., Lees, M. H., Pfeffer, K., & Sloot, P. M. A. (2017). Modelling the impact of household life cycle on slums in Bangalore. *Computers, Environment and Urban Systems*, 64, 275-287.
- Salle, I., Yildizoglu, M., Zumpfe, M. and Senegas, M.-A., (2017) Coordination through social learning in a general equilibrium model, *Journal of Economic Behavior and Organization*, 141, 64-82.
- Schmitt, N., Tuinstra, J., & Westerhoff, F. (2017). Side effects of nonlinear profit taxes in an evolutionary market entry model: Abrupt changes, coexisting attractors and hysteresis problems. *Journal of Economic Behavior & Organization*, 135, 15-38.

Book chapter – refereed

- Hommel, C. (2017). From self-fulfilling mistakes to behavioral learning equilibria. In K. Nishimura, A. Venditti, & N. C. Yannelis (Eds.), *Sunspots and nonlinear dynamics: Essays in honor of Jean-Michel Grandmont* (pp. 97-123). (Studies in Economic Theory; Vol. 31). Cham: Springer.

Dissertation – internally prepared

- Lustenhouwer, J. E. (2017). Monetary and fiscal policy under bounded rationality and heterogeneous expectations.
- Sniekers, F. J. T. (2017). On the functioning of markets with frictions.

Dissertation – externally prepared

- Altaghlibi, M. (2017). Carbon leakage and green growth.
- Böhl, G. A. (2017). Macrofinance dynamics, heterogeneity, and policy design.

Talk or presentation

- Altaghlibi, M. (Speaker), Dynamic Border Carbon Taxes to Enhance Green Growth, 23rd Annual Conference of the European Association of Environmental and Resource Economists (EAERE), Athens, 30 June 2017.
- Diks, C. (Speaker), Complexity in Economics and Finance, Deutsche Physicalische Gesellschaft -- Socio-economic Systems (DPG-SOE) Conference, Dresden, 20 March 2017.
- Diks, C. (Speaker), Comparing Density Forecasts in a Risk Management Context, 11th Conference on Computational and Financial Econometrics, London, UK, 16 December 2017.
- Hennequin, M. (Speaker), Coordination on bubbles in large-group asset pricing experiments, QED Jamboree 2017, 12 May 2017.
- Hennequin, M. (Speaker), Managing coordination on bubbles in experimental asset markets with monetary policy, Experimental Finance 2017, Nice, 15 June 2017.
- Hennequin, M. (Speaker), Managing coordination on bubbles in experimental asset markets with monetary policy, The 23th International Conference on Computing in Economics and Finance, New York, 28 June 2017.
- Hennequin, M. (Speaker), Coordination on bubbles in large-group asset pricing experiments, 70th European Meeting of the Econometric Society: ESEM 2017, Portugal, 23 August 2017.
- Hommel, C. (Speaker), Behavioural & Experimental Macroeconomics: a survey and some recent findings, 5th Workshop in Macro Banking and Finance, Milan, 14-15 September 2017.
- Hommel, C. (Speaker), Learning to believe in simple equilibria in a complex OLG economy. Evidence from the lab, AEA meetings, Chicago, USA, January 6-8, 2017.

- Hommel, C. (Speaker), Amsterdamlezing: Speculatieve zeepbellen en financiële crises in het laboratorium, 28 February 2017.
- Huber, S. (Speaker), Preference for Housing Services and Rational Housing Bubbles, Free University Amsterdam, 2017.
- Huber, S. (Speaker), Preference for Housing Services and Rational Housing Bubbles, University Pompeu Fabra, Barcelona, 2017.
- Huber, S. (Speaker), Preference for Housing Services and Rational Housing Bubbles, Equilibrium, Expectations & Dynamics / CeNDEF (ASE, FEB), 2017.
- Huber, S. (Speaker), Preference for Housing Services and Rational Housing Bubbles, IESEG, Lille, 2017.
- Huber, S. (Speaker), Preference for Housing Services and Rational Housing Bubbles, Ludwig-Maximilians-University (LMU), Munich, 2017.
- Huber, S. (Speaker), Preference for Housing Services and Rational Housing Bubbles, Banque de France, 2017.
- Kopányi, D. (Speaker), Prices vs. Returns in Learning-to-Forecast Experiments, The 22nd Workshop on Economic Science with Heterogeneous Interacting Agents, Milan, 13 Jun 2017.
- Kopányi, D. (Speaker), Prices vs. Returns in Learning-to-Forecast Experiments, Experimental Finance 2017, Nice, 15 June 2017.
- Kopányi-Peuker, A. (Speaker), Are sunspots effective in a big crowd? Evidence from a large-scale bank run experiment, M-BEES: Maastricht Behavioral and Experimental Economics Symposium, Maastricht, 6 June 2017.
- Kopányi-Peuker, A. (Speaker), Are sunspots effective in a big crowd? Evidence from a large-scale bank run experiment, The 22nd Workshop on Economic Science with Heterogeneous Interacting Agents, Milan, 12 June 2017.
- Kopányi-Peuker, A. (Speaker), Are sunspots effective in a big crowd? Evidence from a large-scale bank run experiment, Computation in Economics and Finance (CEF 2017): CEF 2017, New York, 29 Jun 2017.
- Kopányi-Peuker, A. (Speaker), "I" on You: Observer Identity in a Dictator Game, TIBER 2017 Symposium on Psychology and Economics, Tilburg, 25 August 2017.
- Tuinstra, J. (Speaker), Information and learning in the minority game: A strategy experiment, University of Florence, 21 March 2017.
- Tuinstra, J. (Speaker), The overcharge as a measure for antitrust damages, University of Siena, 22 March 2017.
- Tuinstra, J. (Speaker), Prices vs. returns in Learning-to-Forecast experiments, The 23th International Conference on Computing in Economics and Finance, New York, 29 June 2017.
- Tuinstra, J. (Speaker), Prices vs. returns in Learning-to-Forecast experiments, BEAM Project workshop, Kyoto, 4-5 November 2017.
- Wagener, F. (Speaker), The Dynamics, the Economics, and the Expectations, 2nd CRITICS Workshop and Winter School: Critical transitions: Bridging mathematics and practice, Soesterberg, 24 March 2017.
- Wagener, F. (Speaker), Coalition formation in the presence of tipping points, CESifo, 19 May 2017.
- Wagener, F. (Speaker), Coalition formation in the presence of tipping points, EAERE2017 - 23rd Annual Conference of the European Association of Environmental and Resource Economists, Athens, 29 June 2017.
- Wagener, F. (Speaker), Coalition formation in the presence of tipping points, 11th ISDG Workshop, Warsaw, 13 July 2017.
- Wagener, F. (Speaker), Stable Partial Cooperation in Managing Ecological Systems with Tipping Points, 19th Annual BIOECON Conference: Evidence-based environmental policies and the optimal management of natural resources, 22 September 2017.

Prize

- Huber, S. (Recipient), Barcelona GSE SEED grant (5000 Euro) for the project “Biased Expectations and Skill Mismatch”, 2017.
- Hommel, C.H. (Recipient), Wim Duisenberg Research Fellowship, 2017.

Publication peer-review and editorial work

- Amman, H. (Editor in chief), Springer, 1988 -
Amman, H. (Reviewer), Springer, 1 Jan 1989 -
Hommes, C. (Editor), Review of Behavioral Economics, 2014 -
Hommes, C. (Editor), Macroeconomic Dynamics, 1997 -
Hommes, C. (Editor), Computational Economics, 1998 -
Hommes, C. (Editor), Journal of Economic Interaction and Coordination, 2006 -
Hommes, C. (Editor), Journal of Economic Dynamics and Control, 2013 -
Huber, S. (Reviewer), Experimental Economics, 2017.
Kopányi-Peuker, A. (Reviewer), Journal of Behavioral and Experimental Economics, 2017.
Kopányi-Peuker, A. (Reviewer), Games and Economic Behavior, 2016 -
Wagener, F. (Reviewer), Dynamic Games and Applications, 2016 -
Wagener, F. (Reviewer), Economic Journal, 2016 -
Wagener, F. (Reviewer), Environmental and Resource Economics, 2016 -
Wagener, F. (Reviewer), Journal of Economic Behavior & Organization, 2016 -
Wagener, F. (Reviewer), Journal of Economic Theory, 2016 -
Wagener, F. (Reviewer), Journal of Public Economics, 2016 -
Wagener, F. (Reviewer), Nature Communications, 2016 -
Wagener, F. (Reviewer), Applied Mathematical Modelling, 2017.
Wagener, F. (Reviewer), Communications in Nonlinear Science & Numerical Simulation, 2017.
Wagener, F. (Reviewer), Dynamic Games and Applications, 2017.
Wagener, F. (Reviewer), Journal of Economic Dynamics & Control, 2017.
Wagener, F. (Reviewer), Journal of Optimization Theory and Applications, 2017.
Wagener, F. (Reviewer), Journal of the Royal Society Interface, 2017.
Wagener, F. (Reviewer), Mathematical Reviews, 2017.
Wagener, F. (Reviewer), SIAM Journal on Control and Optimization, 2017.

8. ACTUARIAL SCIENCE & MATHEMATICAL FINANCE

Programmeme director: Prof. dr. ir. M.H. Vellekoop
 Section: Quantitative Economics
 JEL-classification: C, G2
 Starting date: 1989
 Website: www.ase.uva.nl/act

8.1 MEMBERS OF THE RESEARCH GROUP AND RESEARCH IN FTES

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Antonio, K.	dr.	ud	0,10	0,10	0,10	1
Berkum, F. van	msc	phd	0,32	0,24	-	3
Berkum, F. van	msc	ud	-	-	0,11	3
Bilsen, S. van	dr.	ud	0,08	0,25	0,25	1
Bilsen, S. van	dr.	ud	0,10	0,30	0,30	3
Boonen, T.	dr.	ud	0,25	0,50	0,50	1
Boonen, T.	dr.	ud	0,25	-	-	3
Can, U.	dr.	ud	0,50	0,50	0,50	1
Doff, R.R.	dr.	guest	0,00	0,00	0,00	1
Engel, K.	msc	guest	0,00	0,00	0,00	1
Fan, Z.	msc	phd	0,80	0,80	-	3
Gastel, L. van	dr.	ud	0,11	0,11	0,08	3
Goovaerts, M.J.	prof. dr.	guest	0,00	0,00	-	1
Hooijsma, J.	msc	phd	0,40	0,40	0,27	3
Hooijsma, J.	msc	guest	-	-	0,00	1
Janssen, M.J.J.	drs.	guest	0,00	-	-	1
Kaas, R.	prof. dr.	guest	0,00	-	-	1
Kloek, T.G.	msc	guest	0,00	0,00	0,00	1
Kort, J. de	msc	phd	0,40	-	-	3
Kuné, J.B.	prof. dr.	guest	0,00	0,00	0,00	1
Laeven, R.	prof. dr.	hgl	0,70	0,70	-	3
Laeven, R.	prof. dr.	hgl	-	-	0,50	1
Lalu, A.	msc	phd	0,40	-	-	1
Li, Z.	msc	phd	0,27	0,80	0,80	1
Linders, D.	dr.	postdoc	0,12	0,23	-	3
Petrov, M.	msc	guest	0,00	0,00	-	1
Ronner, A.E.	prof. dr.	bijz. hgl	0,10	0,10	0,10	1
Schumacher, J.M.	prof. dr.	guest	-	-	0,00	1
Vellekoop, M.	prof. dr.	hgl	0,35	0,50	0,50	1
Vellekoop, M.	prof. dr.	hgl	0,30	-	-	3
Yang, L.	dr.	ud	-	-	0,17	1
Yang, X.	dr.	postdoc	0,53	-	-	3
Yue, Y.	msc	phd	0,80	0,80	0,80	3
Total 1st flow of funds			2,05	2,75	3,42	
Total 2nd flow of funds			0,00	0,00	0,00	
Total 3rd flow of funds			4,83	3,58	1,19	
Total 1st f.o.f. excl. PhD			1,38	1,95	2,62	
Total 1st-3rd flow of funds			6,88	6,33	4,61	
PhD students			3,39	3,04	1,61	

8.2 PROGRAMME DESIGN

The programme concerns both fundamental and applied research in the field of financial institutions. It is mainly directed at insurance companies (for life, non-life, pension and social insurance), but also at banks and other financial intermediaries. Research is performed on the mathematical modeling, estimation, appraisal and control of financial risks of such financial institutions under complete and incomplete information and for complete and incomplete markets. For long term insurance contracts, especially pensions, saving by insurance is significant, which leads to the study of optimal investment and consumption problems. An increasingly important aspect is the influence of the "risk of longevity" on the policies of life insurance, social insurance and care insurance. Newly reported statistics show that life expectancy continues to rise faster than predicted both in the Netherlands and abroad, and the modeling of this effect and its consequences for life insurance policies and pension contracts therefore remains an important area of investigation. Present-day challenges for non-life insurance contracts include decreasing profit margins, increasing competition and selective behaviour of the insured and of insurance companies. In social insurance, there are specific problems that emerge from the privatisation of social insurance contracts. Apart from studying problems in the separate fields of life, non-life, pension and social insurance, work is also done on the theoretical research subject which concerns the unification of several distinct actuarial theories in these fields, and their connection with stochastic financial mathematics.

Supervision and regulation of insurance companies and pension funds form an important part of the field of actuarial research. Methods for risk measurement and the determination of solvency requirements have come under intensified scrutiny in the wake of the recent financial crisis. The new European regulatory framework Solvency II for insurers and the Dutch FTK regulation for pension funds lead to many important new research questions. The Actuarial Science group therefore works on the further development of actuarial risk theory, in particular the development of new mathematical and economic models in the fields of market-consistent valuation, market-consistent pricing and market-consistent embedded value for insurance portfolios.

Other significant fields of research are the interaction between credibility theory, models for the estimation of unreported claims (IBNR) and actuarial ordering of risks, and their consequences for the determination of insurance premiums (risk classification). Credibility models can be viewed as Generalized Linear Mixed Models, having both random (subject-specific) and fixed effects in the linear predictor. Generalized Linear Models and Generalized Linear Mixed Models can be used for a variety of actuarial statistical problems like survival modelling, graduation, multiple-state models, loss distributions, risk classification, premium rating and claims reserving in non-life-insurance. Other aspects are the homogeneity and heterogeneity of insurance portfolios, the probabilistic and subsidising solidarity imposed on the insured, the voluntary or compulsory character of the insurance, and the auto-selection and anti-selection of those insured.

8.3 PROGRAMME EVALUATION

In 2017 a number of PhD projects were successfully concluded: Marko Petrov finished his research on derivatives pricing in a joint Erasmus Mundi project with Universidade Nova de Lisboa and Frank van Berkum submitted his thesis on the statistics of human mortality modelling. We are happy that Frank will remain affiliated with our group for one day a week to continue his research with Katrien Antonio and Michel Vellekoop. Ms. Lu Yang was appointed on a tenure track position after we visited the job market in Chicago at the beginning of 2017. Her research on copula models for insurance experience rating has already been published in the Journal of the American Statistical Association this year, confirming that top journals in statistics and mathematics appreciate actuarial applications when these require the derivation of new mathematical results. We continue to be highly visible in the top actuarial journals as well, with publications in ASTIN Bulletin by Antonio, van

Berkum and Vellekoop (on Bayesian estimation for survival models), and publications in Scandinavian Actuarial Journal and Insurance: Mathematics & Economics by Boonen (on the optimal use of reinsurance, on intergenerational risk sharing, on capital allocation problems and on risk sharing / redistribution with dual utilities) and by Antonio (on censored loss modelling).

Results were disseminated at numerous conferences but also during longer research stays abroad: Katrien Antonio visited the University of Lausanne, Tim Boonen the University of Waterloo, Roger Laeven the Bendheim Center for Finance in Princeton, Yue Yuan the École Polytechnique and Merrick Zhen Li the University of Cambridge. Our visibility in the international arena was further enhanced by the appointment of Roger Laeven on the editorial board of Insurance: Mathematics and Economics.

Although the focus in our research group is on theoretical results, we engage actively with both Dutch and international professionals working in the financial industry or in pension funds and insurance companies. Roger Laeven is the Selected Academic Member of the Insurance and Reinsurance Stakeholder Group (IRSG) of the European Insurance and Occupational Pensions Authority (EIOPA), and Frank van Berkum and Michel Vellekoop are members of the official body of the Dutch Actuarial Society (KAG) that is responsible for the new stochastic mortality model on which the official KAG mortality prognosis for Dutch pension funds and insurance companies is based. Servaas van Bilsen now coordinates the research seminars of Netspar, the Network for Studies on Pensions, Ageing and Retirement, in which Dutch policymakers and representatives from universities cooperate in research programmes which often lead to policy proposals for the Dutch system of retirement provisions. A research proposal about predictive analytics for non-life insurance (written in cooperation with Peter Boswijk and Noud van Giersbergen from the Econometrics Research Group) has resulted in a new PhD position in the section.

Strengths: The composition of our tenure tracks reflects the broad research profile of the group. We therefore expect to continue to play an important role in the national and international research networks which study problems in actuarial science and mathematical finance.

Weaknesses: The group has many junior researchers and only a few senior researchers.

Opportunities: Our statistical expertise makes us a natural partner for other academics and professionals in insurance companies and pension funds who are intensifying their use of data science.

Threats: The number of Bachelor and Master theses that need to be supervised will grow in the coming years, which will put extra strain on all staff members in the group.

8.4 RESOURCES AND FUNDING

- 2013-: EDEEM PhD Research Grant, jointly with Universidade Nova de Lisboa (Position of Marko Petrov).
- 2017-2021: Sponsoring of research project “Risk and Regulation” (in the chair of Risk and Insurance), Verbond van Verzekeraars.
- 2017- : VIVAT PhD Research Grant, jointly with Econometrics Group.

8.5 OUTPUT

Key publications

Aït-Sahalia, Y., J. Fan, R. J. A. Laeven, C. Dan Wang & X. Yang (2017). Estimation of the continuous and discontinuous leverage effects. Journal of the American Statistical Association 112 (520), 1744-1758.

van Berkum, F., Antonio, K., & Vellekoop, M. (2017). A Bayesian joint model for population and portfolio-specific mortality. *ASTIN Bulletin*, 47(3), 681-713.

Boonen, T. J., Tsanakas, A., & Wüthrich, M. V. (2017). Capital allocation for portfolios with non-linear risk aggregation. *Insurance: Mathematics & Economics*, 72, 95-106.

Can, S. U., Einmahl, J. H. J., Khmaladze, E. V., & Laeven, R. J. A. (2015). Asymptotically distribution-free goodness-of-fit testing for tail copulas. *The Annals of Statistics*, 43(2), 878-902.

Laeven, R. J. A. & M. A. Stajje (2014). Robust portfolio choice and indifference valuation. *Mathematics of Operations Research* 39, 1109-1141.

Forthcoming

Asimit, A. V., & Boonen, T. J. Insurance with multiple insurers: A game-theoretic approach. *European Journal of Operational Research*.

Boonen, T. J., Pantelous, A. A., & Wu, R. (2018). Non-cooperative dynamic games for general insurance markets. *Insurance: Mathematics & Economics*.

Boswijk, H. Peter, Roger J. A. Laeven & Xiye Yang. Testing for self-excitation in jumps, *Journal of Econometrics*.

Krätschmer, V., M. Ladkau, R. J. A. Laeven, J. G. M. Schoenmakers & M. Stajje. Optimal stopping under uncertainty in drift and jump intensity, *Mathematics of Operations Research*.

Shi, P., & Yang, L. (2017). Pair Copula Constructions for Insurance Experience Rating. *Journal of the American Statistical Association*.

E-publication ahead of print

Kaas, R., Laeven, R. J. A., Lin, S., Tang, Q., Willmot, G., & Yang, H. (2017). IME’s Editorial Board. *Insurance: Mathematics & Economics*.

Shi, P., & Yang, L. (2017). Pair Copula Constructions for Insurance Experience Rating. *Journal of the American Statistical Association*.

Stripling, E., Vanden broucke, S., Antonio, K., Snoeck, M., & Baesens, B. (2017). Profit maximizing logistic model for customer churn prediction using genetic algorithms. *Swarm and Evolutionary Computation*.

Publications in numbers

Output type	Classification	#
Articles in journals	Refereed	16
	Non-refereed	0
	Professional	1
	Popular	0
Books or book chapters	Refereed	0
	Non-refereed	0
	Professional	0
	Popular	0
Report	Professional	1
Conference proceedings		0
PhD theses		2
Total		20

Article in journal – refereed

- Aït-Sahalia, Y., Fan, J., Laeven, R. J. A., Wang, C. D., & Yang, X. (2017). Estimation of the Continuous and Discontinuous Leverage Effects. *Journal of the American Statistical Association*.
- Antonio, K., Devriendt, S., de Boer, W., de Vries, R., De Waegenaere, A., Kan, H. K., ... Vellekoop, M. (2017). Producing the Dutch and Belgian mortality projections: a stochastic multi-population standard. *European Actuarial Journal*, 7(2), 297-336.
- Bao, H., Ponds, E. H. M., & Schumacher, J. M. (2017). Multi-period risk sharing under financial fairness. *Insurance: Mathematics & Economics*, 72, 49-66.
- Berkum, F. van, Antonio, K., & Vellekoop, M. (2017). A Bayesian joint model for population and portfolio-specific mortality. *ASTIN Bulletin*, 47(3), 681-713.
- Boonen, T. J. (2017). Risk redistribution games with dual utilities. *ASTIN Bulletin*, 47(1), 303-329.
- Boonen, T. J., Tsanakas, A., & Wüthrich, M. V. (2017). Capital allocation for portfolios with non-linear risk aggregation. *Insurance: Mathematics & Economics*, 72, 95-106.
- Boonen, T. J., De Waegenaere, A., & Norde, H. (2017). Redistribution of longevity risk: The effect of heterogeneous mortality beliefs. *Insurance: Mathematics & Economics*, 72, 175-188.
- Boonen, T. J., & De Waegenaere, A. (2017). Intergenerational risk sharing in closing pension funds. *Insurance: Mathematics & Economics*, 74, 20-30.
- Boonen, T. J. (2017). Risk sharing with expected and dual utilities. *ASTIN Bulletin*, 47(2), 391-415.
- Boonen, T. J., & Li, H. (2017). Modeling and forecasting mortality with economic growth: a multipopulation approach. *Demography*, 54(5), 1921-1946.
- Boonen, T. J. (2017). Solvency II Solvency Capital Requirement for life insurance companies based on Expected Shortfall. *European Actuarial Journal*, 7(2), 405-434.
- Chen, A., Vellekoop, M., Optimal investment and consumption when allowing terminal debt, *European Journal of Operational Research*, 258, 1.
- Dhaene, J., Godecharle, E., Antonio, K., Denuit, M., & Hanbali, H. (2017). Lifelong health insurance covers with surrender values: updating mechanisms in the presence of medical inflation. *ASTIN Bulletin*, 47(3), 803-836.
- Kleinow, T., & Schumacher, J. M. (2017). Financial fairness and conditional indexation. *Scandinavian Actuarial Journal*, 2017(8), 651-669.
- Reynkens, T., Verbelen, R., Beirlant, J., & Antonio, K. (2017). Modelling censored losses using splicing: a global fit strategy with mixed Erlang and extreme value distributions. *Insurance: Mathematics & Economics*, 77, 65-77.
- Zhuang, S. C., Boonen, T. J., Tan, K. S., & Xu, Z. Q. (2017). Optimal insurance in the presence of reinsurance. *Scandinavian Actuarial Journal*, 2017(6), 535-554.

Article in journal – professional

- Kort, J. de, & Vellekoop, M. H. (2017). Existence of optimal consumption strategies in markets with longevity risk. *Insurance: Mathematics & Economics*, 72, 107-121.

Report - professional

- Boonen, T. (2017). *Expected Shortfall voor toezicht op verzekeraars: is het relevant?* (Netspar Design Paper; Vol. 80). Tilburg: Netspar.

Dissertation – internally prepared

- Kort, J.P. de (2017). Essays on long-term mortality and interest rate risk.
- Fan, Z. (2017). Essays on international portfolio choice and asset pricing under financial contagion.

Talk or presentation

Berkum, F. van (Speaker), Unraveling relevant risk factors explaining pension fund mortality: a case study in the Netherlands, Netspar Pension Day, 2017.

Can, U. (Speaker), Asymptotically Distribution-Free Goodness-of-Fit Testing for Copulas, 10th International Conference on Extreme Value Analysis, Delft, 30 June 2017.

9. MINT - MACRO AND INTERNATIONAL ECONOMICS

Programme director: Prof. dr. F.J.G.M. Klaassen
 Section: Macro and International Economics
 JEL-classification: E, F, H
 Starting date: 2001
 Website: www.ase.uva.nl/mint

9.1 MEMBERS OF THE RESEARCH GROUP AND RESEARCH IN FTES

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Beetsma, R.	prof. dr.	hgl	0,25	0,25	0,25	1
Beetsma, R.	prof. dr.	hgl	0,25	0,25	0,25	3
Bonthuis, B.	msc	guest	0,00	0,00	0,00	1
Chan, S.	msc	phd	0,80	0,53	-	1
Chan, S.	msc	guest	-	0,00	0,00	1
Chen, D.	msc	phd	0,80	0,53	-	3
Chen, D.	msc	guest	-	0,00	-	1
Chen, D.	dr.	postdoc	-	-	0,16	3
Ciminelli, G.	msc	guest	-	0,00	0,00	1
Ciurila, N.	msc	phd	0,80	0,80	0,60	1
Clymo, A.	dr.	postdoc	-	0,80	0,47	1
Ewijk, C. van	prof. dr.	hgl	0,08	0,08	0,08	1
Ewijk, C. van	prof. dr.	hgl	0,05	0,05	0,05	2
Ewijk, C. van	prof. dr.	hgl	0,30	0,30	0,30	3
Furtuna, O.	msc	phd	0,80	0,80	0,27	1
Furtuna, O.	msc	guest	-	-	0,00	1
Giuliodori, M.	prof. dr.	hgl	0,50	0,50	0,50	1
Gornicka, L.	msc	phd	0,53	-	-	2
Hanson, J.	msc	guest	0,00	0,00	0,00	1
Houben, A.	prof. dr.	hgl	0,00	0,00	0,00	1
Jakucyonite, E.	msc	phd	0,80	0,80	0,47	1
Jager, H.	prof. dr.	guest	0,00	0,00	0,00	1
Kastelein, P.	msc	phd	-	0,20	0,20	2
Klaassen, F.J.G.M.	prof. dr.	hgl	0,50	0,50	0,50	1
Knot, K.	prof. dr.	hgl	0,00	0,00	0,00	1
Kwaak, C. van der	msc	phd	0,80	0,40	-	2
Kwaak, C. van der	msc	guest	-	0,00	-	1
Leefmans, N.	drs.	docent	0,00	0,00	0,00	1
Lekniute, Z.	msc	guest	0,00	0,00	0,00	1
Lorié, J.A.	dr.	guest	0,00	0,00	0,00	1
Maurik, R. van	msc	phd	0,80	0,80	0,54	3
Maurik, R. van	msc	guest	-	-	0,00	1
Mavromatis, K.	dr.	ud	0,50	0,50	0,13	1
Micevska Scharf, M.	dr.	postdoc	0,80	0,03	-	2
Neamtu, I.	msc	phd	-	-	0,27	1
Parlevliet, J.	msc	guest	0,00	0,00	0,00	1
Pinter, J.	msc	guest	0,00	-	-	1
Romp, W.E.	dr.	ud	0,50	0,50	0,42	1
Singh, S.	msc	phd	0,80	0,53	-	1

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Singh, S.	msc	guest	-	0,00	0,00	1
Stoltenberg, C.A.	dr.	ud	0,50	0,50	0,50	1
Teulings, C.N.	prof dr	hgl	0,10	0,10	0,10	1
Teulings, R.	msc	phd	0,80	0,67	-	1
Teulings, R.	msc	guest	-	0,00	0,00	1
Veestraeten, D.	dr.	ud	0,25	0,00	0,00	1
Vos, S.J.	drs.	guest	0,00	0,00	0,00	1
Westerhout, E.	dr.	ud	0,25	0,17	-	1
Wijnbergen, S.J.G.	prof. dr.	hgl	0,50	0,50	0,50	1
Zhao, L.	msc.	phd	0,53	-	-	3
Zhuo, R.	msc.	phd	0,20	0,80	0,80	1
Zouain Pedroni, M.	dr.	ud	0,21	0,50	0,50	1
Total 1st flow of funds			9,14	9,83	6,36	
Total 2nd flow of funds			2,18	0,68	0,25	
Total 3rd flow of funds			2,68	1,88	1,25	
Total 1st f.o.f. excl. PhD			4,14	4,10	3,95	
Total 1st-3rd flow of funds			14,00	12,39	7,86	
PhD students			8,46	6,86	3,15	

9.2 PROGRAMME DESIGN

Objective

The programme uses empirical and theoretical methods to analyse important economic issues in the areas of macroeconomics and international economics. Special emphasis is given to the evaluation of existing fiscal and monetary policies and the question how these policies can be improved upon. Dissemination of the results takes place mainly via international, refereed scientific journals, but also via more policy-oriented outlets.

Motivation

The economic growth that a country experiences not only has direct effects on the available resources, it can also have important indirect effects through, for example, the stability of the social and political environment. Similarly, the business cycle fluctuations countries face can have far-reaching consequences to many, especially if these fluctuations mainly fall on subgroups within the population. It is therefore crucial to thoroughly understand the characteristics of economic developments, the factors behind them, and to what extent and how governments can affect these developments. The recent international sovereign debt crisis and discussions on the sustainability of pension systems exemplify this.

Themes

Major international economic developments and policy debates generate a continuous stream of research ideas for our group. The resulting projects are often intertwined, but we choose to categorize them into the following (interrelated) themes. Only a selection of all projects will be discussed.

Fiscal policy and sovereign debt

Fiscal policy is a crucial aspect of macroeconomics. Given that government expenditures are a substantial fraction of GDP, they play an important role in welfare redistribution, and financing these expenditures through debt and taxes is likely to have important effects on, for example, financial

markets, labour force participation, and investment. Roel Beetsma, Massimo Giuliodori, and Jesper Hanson analyze the effects of auctions on sovereign bond yields at secondary markets. They document that auctions result in a temporary increase in yields at markets of other euro area countries. So it may be optimal for debt management offices to coordinate debt issuance, in order to avoid concurrent auctions. Gabriele Ciminelli and Massimo Giuliodori analyze the effects of tax-based consolidations on income inequality, output and labor market conditions. They find that that such policy reduces income inequality, but at the cost of weaker economic activity.

Financial fragility and macroeconomics

This theme was also stimulated by the recent crises, showing the interaction between banking distress, fiscal policy to mitigate financial crisis, public debt, sovereign risk, international spill overs, and banking supervision. Stephanie Chan and Sweder van Wijnbergen study contingent convertible capital (CoCos), which are bonds issued by banks that can be written off or converted to equity in times of distress. CoCos have played a major role in meeting the new higher capital requirements banks are confronted with since the global financial crisis. The authors show that CoCos, while increasing loss absorption capacity in banks and so contributing to stability, also encourage risk taking and may in fact trigger bank runs. Ioana Neamtu and Sweder van Wijnbergen continue this line of research. They study the Swiss CoCo regulation for large banks and show that the current CoCo structure harms the bank in case of crisis, instead of helping it. Egle Jakucionyte and Sweder van Wijnbergen study how depreciations of currencies in Eastern Europe in October 2008, where the private sector had borrowed heavily in foreign currency, has created debt overhang, and they find this a potential reason for the prolonged recession. Aerd Houben aims to establish the effectiveness of macro-prudential policies across advanced and emerging economies. Effectiveness is assessed on the basis of the impact on broad credit aggregates as well as on substitution effects from bank to non-bank credit.

Monetary economics and policy

Monetary policy is used throughout the world to accomplish important macroeconomic objectives such as price stability, exchange rate stability, and/or full employment. In response to the Great Financial Crisis, central banks around the world have adopted a series of non-standard policy measures. One is forward guidance, where the central bank informs the public about its intended future monetary policies. In one project Gabriele Ciminelli empirically investigates whether forward guidance helps to explain government bond yields, inflation expectations and exchange rates. Kostas Mavromatis studies the macroeconomic effects of forward guidance when agents are boundedly rational and form heterogeneous expectations about the future stance of monetary policy. He finds that such heterogeneity may either delay the recovery of the economy, or make it even faster depending on the degree of heterogeneity and the speed of learning of agents.

Foreign exchange market

The foreign exchange market is the largest financial market in the world. Many countries have managed or fixed exchange rates. Speculative attacks on them can have serious economic and societal consequences. Franc Klaassen, Kostas Mavromatis, and Rui Zhuo study exchange market pressure, that is, the pressure on a currency to depreciate, and the consequences for monetary policy. Dirk Veestraeten examines exchange rate dynamics under the prospect of (potential) future shifts in the regime, such as the move towards a fixed exchange rate. He studies the transition of the pound back to the gold standard in the 1920s and the claim by Keynes that the prospect of such a return at the first instance of hitting the pre-war parity actually fuelled the appreciation back to gold in April 1925 at an overvalued value. Extending the tools of stochastic process switching he can generate precisely the type of overvaluation that Keynes saw.

Pensions

Research projects of Roel Beetsma, Damiaan Chen, Nicoleta Ciurila, Casper van Ewijk, Pim Kastelein, Ron van Maurik, Ward Romp, Siert Vos, Sweder van Wijnbergen focus on the optimal design of pensions systems, which is heavily debated at present, and their sustainability and the consequences of changing them. For example, Roel Beetsma and Damiaan Chen model the decision

of individuals to participate in a collective pension scheme as an (American) option with approximately infinite exercise dates, and they investigate whether the Dutch pension scheme would be stable in the absence of mandatory participation. Roel Beetsma, Ron van Maurik, and Ward Romp have constructed a unique comprehensive dataset of pension reforms for a broad sample of OECD countries since 1970. They find that many pension reforms are triggered by problems in the government's budget, despite the fact that pension reforms are primarily aimed at the longer run. Casper van Ewijk investigates the relation between pension wealth and GDP and concludes that funded pensions contribute to economic growth. In particular, funded pensions create deeper capital markets and make it easier for firms to finance their investment.

Inequality

Several measures of inequality have increased over the past decades, something that has also been communicated by Piketty in his recent book. This, and the fact that the economics profession with the help of computers has been able to tackle ever more complex models with heterogeneous agents makes inequality an increasingly important research theme. Marcelo Pedroni studies how governments should tax capital and labour income. Such taxation reduces inequality, but at the expense of distorting individuals decisions. Ultimately, the optimal taxes must weigh these cost and benefits and he provides a quantitative answer to this question. Christian Stoltenberg and Swapnil Singh study the relationship between income and consumption inequality. They explain why the present workhorse heterogeneous agent models are not able to capture some salient features of the data, and they show how incorporating the extra information individuals have about their future income improves the fit with the data.

9.3 PROGRAMME EVALUATION

In 2017 MInt published 11 articles in international refereed journals, and there are 6 of such publications forthcoming. Roel Beetsma and the other members of the European Fiscal Board finished their first Annual Report, which was presented to the College of EU Commissioners and the Ecofin, and they presented another report to the Eurogroup. The Risk and Macro Finance research, one of the key Economics and Business research themes and with Sweder van Wijnbergen as one of the co-managers, was externally evaluated as very successful. Klaas Knot, president of the Dutch Central Bank and member of MInt, gave his guest lecture for our students. The paper by Roel Beetsma, Ron van Maurik, and Ward Romp on the explanation of pension reforms was discussed at VoxEU, and in the Eurointelligence daily briefing. John Lorié was interviewed twice by Bloomberg on US growth and oil prices. Dirk Veestraeten won the third prize of the Van der Schroeff Award for best UvA Economics and Business lecturer. MInt was also successful at the international job market, where we recruited Elisabeth Pröhl for a tenure track position starting next year.

The students of the group have also done well. Christiaan van der Kwaak and Stephanie Chan obtained their PhDs, supervised by Sweder van Wijnbergen. Also Swapnil Singh, supervised by Roel Beetsma and Christian Stoltenberg, and Ron van Maurik, by Roel Beetsma and Ward Romp, graduated. Pim Kastelein continued his PhD project financed by an NWO Research Talent grant. Ioana Neamtu won the Teaching Assistant of the Year Award 2017 at the Tinbergen Institute.

The year 2017 experienced some changes in the composition of the group. Coen Teulings decided to leave at the end of the year. Kostas Mavromatis accepted a job at the Dutch Central Bank (DNB), but he remains affiliated with MInt for teaching. Alex Clymo moved to the University of Essex. Several PhD students obtained a job via the international job market. Stephanie Chan started at a tenure track position at Xiamen University. Swapnil Singh and Egle Jakucionyte started at the Bank of Lithuania, Oana Furtuna at the European Central Bank, and Rutger Teulings at the CPB (Netherlands Bureau for Economic Policy Analysis). Ioana Neamtu joined from the Tinbergen Institute MPhil program. More new PhD students will start next year. MInt members are currently trying to attract internationally renowned researchers to further strengthen the group. We continue to stimulate the coherence of the group by seminars, joint lunches, drinks, and other activities.

The visibility of the group and the interaction with the academic community have been further enhanced through joint papers, numerous external presentations, conference participations, contacts with renowned universities (including the University of Chicago, London School of Economics, New York University, University College London, University of Oxford, and Yale University), and participation in networks such as Netspar, where Casper van Ewijk is the director. We have a seminar series with well-known speakers, which is organised jointly with the VU University Amsterdam and funded by the Tinbergen Institute. The programme is being noticed by the outside world, for instance reflected by invitations for presentations, contributions to research volumes, referee activities, and the aforementioned non-academic exposure.

There are intensive contacts with policy institutions via visitorships and joint research papers (Bank of Canada, Bank of England, Deutsche Bundesbank, ECB, European Commission, Federal Reserve Bank of Minneapolis, German Ministry of Finance, ILO, IMF, OECD, World Bank, WTO, among others), via Preadviezen for the Koninklijke Vereniging voor de Staathuishoudkunde, via joint positions (Maja Micevska Scharf is also affiliated to the CPB), consultancy work (ECB) advisory positions (DNB), seminars, teaching (by employees of DNB), and memberships of several advisory committees for the EU, ECB, World Economic Forum, BIS, IMF, and the Dutch government, such as the Social and Economic Council of the Netherlands (SER). There are also direct contacts with several Dutch ministers and members of parliament, also in parliamentary hearings, on topics such as pension reform, financial sector reform, and general macroeconomic policy.

MInt has collaborations with the business sector, such as APG, Atradius, a.s.r. Vermogensbeheer, Bedrijfstakpensioenfond Detailhandel, BNG Vermogensbeheer, MN, Nuon, and SEO Economisch Onderzoek. And MInt takes part in public debates on issues such as health care, pension reform and reform of the banking sector. Particularly Roel Beetsma, Casper van Ewijk, and Sweder van Wijnbergen are frequently asked by radio and television channels to comment on such topics, and they regularly write for opinion pages of quality newspapers. Another sign of the societal relevance is that many BSc and MSc students take our courses and write their theses at MInt. Those students also offer ways to disseminate insights from research on key (inter)national events and debates to society.

Strengths: Good and relevant productivity and good (inter)national reputation. High societal relevance: numerous contacts with policy makers, businesses, media, and so on. Strong PhD program. Solid funding base, not only because we serve many BSc and MSc students, but also because of our connections to the non-academic world. Coherent group. Good seminar series, joint with the VU.

Weaknesses: We experience severe competition in the job market, especially from financial and policy institutions. Because of good outside options, it is easy to lose good researchers and not always easy to convince excellent undergraduate students to pursue a PhD.

Opportunities: We are trying to increase external funding so as to enlarge the group. Our expanding contacts with the financial industry generate opportunities in this regard. We have contacts with many BSc and MSc students and alumni, which creates opportunities for the research group, for example through their contacts at policy institutions and businesses. We wish to further exploit our international contacts.

Threats: It is hard to attract top tenure trackers. The increase in the number of students, which by itself is good, makes it difficult for the existing staff to have enough time for research. Another threat comes from the decreasing funding for research, partly because of the UvA allocation model.

9.4 RESOURCES AND FUNDING

To finance our conferences, traveling, seminars, visitors, and so on, we use first-stream resources from the government, funds from the ASE Research Institute, the Tinbergen Institute, and the

following other resources. The successful cooperation between Roel Beetsma and MN, one of the largest pension administrators and pension wealth managers in the Netherlands, has continued. The company sponsors the MN Chair in Pension Economics and two PhD students. Moreover, Casper van Ewijk uses a European (NWO-ORA) subsidy on social security contributions and wages (postdoc). His own research time is also to a large extent sponsored by Netspar. Henk Jager has obtained an NWO doctoral grant for teachers. Risk and Macro Finance finances the postdoc position of Alex Clymo. Pim Kastelein's research, supervised by Roel Beetsma and Ward Romp, is financed by a four-year NWO Research Talent grant. Damiaan Chen's postdoc position is partly financed by a Netspar grant, obtained by Roel Beetsma and Sweder van Wijnbergen, and Casper van Ewijk uses another Netspar grant.

9.5 OUTPUT

Key publications

- Beetsma, R.M.W.J., Cimadomo, J., Furtuna, O. & Giuliadori, M. (2015). The confidence effects of fiscal consolidations. *Economic Policy*, 30 (83), 439-489.
- Beetsma, R. M. W. J., Cukierman, A., & Giuliadori, M. (2016). The Political Economy of Redistribution in the U.S. in the Aftermath of World War II - Evidence and Theory. *American Economic Journal. Economic Policy*, 8(4), 1-40.
- Buhai, S.I., Portela, M.A. Teulings, C.N. & Van Vuuren, A. (2014). Returns to tenure or seniority? *Econometrica*, 82, 705-730.
- Kirchner, M., & van Wijnbergen, S. (2016). Fiscal deficits, financial fragility, and the effectiveness of government policies. *Journal of Monetary Economics*, 80, 51-68.
- Kriwoluzky, A. & Stoltenberg, C.A. (2015). Monetary Policy and the Transaction Role of Money in the United States. *Economic Journal*, 125, 1452-1473.
- Schabert, A. & Van Wijnbergen, S.J.G. (2014). Sovereign default and the stability of inflation targeting regimes. *IMF Economic Review*, 62, 261-287.
- Van Wijnbergen, S. J. G., & Homar, T. (2016). Bank recovery and economic recovery after Financial Crises. *Journal of Financial Intermediation*.

Forthcoming

- Beetsma, R.M.W.J., Giuliadori, M., Hanson, J. & Jong, F.J.C.M. de (2018). Cross-Border Auction Cycle Effects of Sovereign Bond Issuance in the Euro Area. *Journal of Money, Credit and Banking*.
- Heijden, M. van der, Beetsma, R.M.W.J. & Romp, W.E. (2018). "Whatever it takes" and the role of Eurozone news, *Applied Economics Letters*.
- Beetsma, R.M.W.J., Giuliadori, M., Hanson, J. & Jong, F.J.C.M. de (2018). Bid-to-cover and yield changes around public debt auctions in the euro area. *Journal of Banking & Finance* 87, 118-134.
- Homes, C., Lustenhouwer, J. & Mavromatis, K. (2018). Fiscal consolidations and heterogeneous expectations. *Journal of Economic Dynamics and Control*, 87, 173-205.
- Mavromatis, K. (2018). US Monetary Regimes and Optimal Monetary Policy in the Euro Area. *Journal of Money, Credit and Banking*.
- Teulings, C.N., Ossokina, I.V, & de Groot, H.L.F. (2018). Land use, worker heterogeneity and welfare benefits of public goods. *Journal of Urban Economics*, 103, 67-82.

Publications in numbers

Output type	Classification	#
Articles in journals	Refereed	14
	Non-refereed	0
	Professional	4
	Popular	11
Books or book chapters	Refereed	0
	Non-refereed	0
	Professional	0
	Popular	0
Reports	Professional	8
Conference proceedings		0
PhD theses		5
Total		42

Article in journal – refereed

- Beetsma, R., Giuliadori, M., & Sakalauskaite, I. (2017). Long-Term Interest Rates and Public Debt Maturity. *Economica*, 84(335), 541-558.
- Beetsma, R. M. W. J., Giuliadori, M., de Jong, F. C. J. M., & Widijanto, D. (2017). The Impact of News and the SMP on Realized (Co)variances in the Eurozone Sovereign Debt Market. *Journal of international Money and Finance*, 75, 14-31.
- Chen, D. H. J., Beetsma, R. M. W. J., Broeders, D. W. G. A., & Pelsser, A. A. J. (2017). Sustainability of participation in collective pension schemes: An option pricing approach. *Insurance: Mathematics & Economics*, 74, 182-196.
- Draper, N., Westerhout, E., & Nibbelink, A. (2017). Defined benefit pension schemes: a welfare analysis of risk sharing and labour market distortions. *Journal of Pension Economics and Finance*, 16(4), 467-484.
- Ewijk, C. van (2017). Duidelijkheid over Pensioenen. *TPEdigitaal*, 11(3), 16-20.
- Kwaak, C. van der, & van Wijnbergen, S. (2017). Sovereign debt and bank fragility in Spain. *Review of World Economics*, 153(3), 511–543.
- Leeuwen, B. van, van Leeuwen-Li, J., & Foldvari, P. (2017). Human Capital in Republican and New China: Regional and Long-Term Trends. *Economic History of Developing Regions*, 32(1), 1-36.
- Parlevliet, J. (2017). What drives public acceptance of reforms? Longitudinal evidence from a Dutch pension reform. *Public Choice*, 173(1-2), 1–23 .
- Rooduijn, M., van der Brug, W., de Lange, S. L., & Parlevliet, J. (2017). Persuasive Populism? Estimating the Effect of Populist Messages on Political Cynicism. *Politics and Governance*, 5(4), 136-145.
- Teulings, C. N., Ossokina, I. V., & de Groot, H. L. F. (2017). Land use, worker heterogeneity and welfare benefits of public goods. *Journal of Urban Economics*, 103, 67-82.
- Veestraeten, D. J. M. (2017). An integral representation for the product of parabolic cylinder functions. *Integral Transforms and Special Functions*, 28(1), 15-21.
- Veestraeten, D. (2017). On the multiplicity of option prices under CEV with positive elasticity of variance. *Review of Derivatives Research*, 20(1), 1-13.
- Veestraeten, D. (2017). An alternative integral representation for the product of two parabolic cylinder functions. *Integral Transforms and Special Functions*, 28(12), 915-922.
- Zhao, L., & van Wijnbergen, S. (2017). Decision Making in Incomplete Markets with Ambiguity: a case study of a gas field acquisition. *Quantitative Finance*, 17(11), 1759-1782.

Article in journal – professional

- Dröes, M., Houben, A., & van Lamoen, R. (2017). De Prijsstijgingen op de Amsterdamse huizenmarkt onder de loep. *Economisch-Statistische Berichten*, 102(4755), 540-543.
- Lorié, J. (2017). Licht aan de horizon: Kentering wereldeconomie in zicht. *Globe Magazine*, 419, 22-23.
- van Ewijk, C. (2017). Pensioenstelsel niet meer houdbaar. *Zeggenschap/Tijdschrift over Arbeidsverhoudingen*, 28(4), 4.
- Vos, S. J., Joseph, A. S., Arts, J., & Blom, L. (2017). Persoonlijk Pensioen met collectieve elementen. *PensioenMagazine*, (98).

Article in journal – popular

- Beetsma, R. M. W. J., & van Wijnbergen, S. J. G. (2017). Oplossing van pensioenvraagstuk is niet mogelijk zonder duidelijke keuzes. *Financieel dagblad*.
- Beetsma, R. M. W. J., & Gradus, R. H. J. M. (2017). Geen verwarring scheppen over het houdbaarheidssaldo van de overheid. *Financieel dagblad*.
- Beetsma, R. M. W. J. (2017). Weerstand tegen het onconventionele beleid van Europese Centrale Bank steeds groter. *De Volkskrant*.
- Beetsma, R. M. W. J., & Gradus, R. H. J. M. (2017). Belang van houdbaarheidssaldo voor beleid is eerder onder- dan overschat. *Financieel dagblad*.
- Beetsma, R. M. W. J., & Gradus, R. H. J. M. (2017). Sociale vlaktaks heeft voordelen voor alle partijen in de kabinetsformatie. *Financieel dagblad*.
- Beetsma, R. M. W. J., & van de Kieft, R. (2017). Pensioengeld kan niet als bescherming dienen tegen buitenlandse kopers. *Financieel dagblad*.
- Beetsma, R. M. W. J., & Koudjeti, F. (2017). Waar blijft de islamvriendelijke hypotheek? *NRC Handelsblad, Opinie*.
- Beetsma, R. M. W. J., & van Wijnbergen, S. J. G. (2017). Globalisering vereist meer vormen voor arbeidscontract. *Financieel dagblad*.
- Beetsma, R. M. W. J., & van Veen, A. (2017). Waarom Nederland moet inzetten op een zachte brexit. *Financieel dagblad*.
- Beetsma, R. M. W. J., & Gradus, R. H. J. M. (2017). Hoger tarief voor belastingen van winst multinationals werkt contraproductief. *Financieel dagblad*.
- Tselms, R., Parlevliet, J., & Rooduijn, M. (2017). Winnaars en verliezers van vrij verkeer van werknemers. *Economisch-Statistische Berichten*, 102(4754S), 68-70.

Report - Professional

- Frehen, L., van Wel, W., van Ewijk, C., Bonekamp, J., van Valkengoed, J., & Boeijen, D. (2017). *Heterogeniteit in doorsneeproblematiek: Hoe pakt de transitie naar degressieve opbouw uit voor verschillende pensioenfondsen?* (Netspar Design Paper ; No. 67). Tilburg: Netspar.
- Mehlkopf, R., van Ewijk, C., van den Bleeken, S., & Hoet, C. (2017). *De waarde van maatwerk in pensioenen*. (Netspar Brief; Vol. 8). Tilburg: Netspar.
- Thygesen, N., Beetsma, R., Bordignon, M., Duchene, S., & Szczurek, M. (2017). *Assessment of the prospective fiscal stance appropriate for the euro area*. Brussels: European Fiscal Board.
- Thygesen, N., Beetsma, R., Bordignon, M., Duchene, S., & Szczurek, M. (2017). *Annual Report 2017 European Fiscal Board*. Brussels: European Commission.
- Ewijk, C. van, Bos, F., & Romijn, G. (2017). *Kosten van belastingheffing, baten van inkomensherverdeling en MKBA's*. Ministerie van Financiën.
- Ewijk, C. van, Mehlkopf, R., van den Bleeken, S., & Hoet, C. (2017). *Welke keuzemogelijkheden zijn wenselijk vanuit het perspectief van de deelnemer?* (Netspar design paper; No. 71). Tilburg: Netspar Design Paper.
- Ewijk, C. van, Werker, B. J. M., & Lever, M. (2017). *Overgangseffecten bij afschaffing doorsneesystematiek: een gezamenlijk rapport van CPB en Netspar*. (Netspar occasional paper; No. 03). Netspar.

Ewijk, C. van (2017). *Doorsneeprobleem en heterogene fondsen: een analytische benadering*. (Netspar Occasional Paper; No. 2017-04). Tilburg: Netspar.

Dissertation – internally prepared

Chan, S. (2017). Wake Me Up Before You CoCo: Implications of contingent convertible capital for financial regulation.

Hart, F.M.A. 't (2017). Zorgplicht bij financiële dienstverlening.

Kwaak, C.G.F. van der (2017). The macroeconomics of banking.

Maurik, R.E.F. van (2017). The economics of pension reforms.

Singh, S. (2017). Three essays on the insurance of income risk and monetary policy.

Talk or presentation

Houben, A. (Speaker), Bail-in Policies for European Banks, Center for Monetary and Banking Studies, January 2017.

Houben, A. (Speaker), Brexit and European financial markets, College of Europe, April 2017.

Houben, A. (Speaker), Is EMU sustainable?, Europa Instituut Leiden, April 2017.

Houben, A. (Speaker), Het onconventionele monetaire beleid van de ECB, Vereniging Rente Gilde, October 2017.

Lorié, J. (Speaker), Global economic game changers for the future, Nyenrode University, 17 March 2017.

Lorié, J. (Speaker), Steering into calmer waters, Swiss Credit Managers Meeting, Brunnen, 12 September 2017.

Teulings, R. (Speaker), Brexit and The Impact of Gradual Economic Integration on Export, ETSG 2017 Florence: 19th Annual Conference, Florence, 15 September 2017.

Zouain Pedroni, M. (Speaker), Discussant of a paper in the Tax Issues Session, ASSA-AEA Meetings, 6-8 January, Chicago, 6 January 2017.

Zouain Pedroni, M. (Speaker), Presentation of "Optimal Fiscal Policy in a Model with Uninsurable Idiosyncratic Shocks", European University Institute, March 2017.

Publication peer-review and editorial work

Ewijk, C. van (member of editorial board), *De Economist*, 2016 -.

Prize

Houben, A., Second runner-up Van der Schroeff Award 2016 for Best Lecturer, 2017.

Media appearances

Ewijk, C. van, Expert Comment, Een goed pensioen is genoeg geld op het juiste moment in je leven', *Het Financieele Dagblad*, 20/10/17.

Houben, A. Onder de toga's van professoren is het een vrolijke boel, *Trouw*, 2/09/17.

Klaassen, F. Research, More or Less: Behind the Statistics, *BBC*, 13/07/17.

Klaassen, F. Research, Met het oog op morgen: Trump's trade restrictions, 20/12/17.

Lorié, J., Expert Comment, Meer schade claims door lagere olieprijs, *RTLZ*, 7/02/17.

Lorié, J., Expert Comment, Atradius 'Lorié is Optimistic on US Growth, *Bloomberg Markets Middle East*, 26/04/17.

Lorié, J., Expert Comment, Oil Resumes Slide on US Stockpiles, *Bloomberg Middle East*, 26/04/17.

Lorié, J., Expert Comment, Trade Winds Shifting, *Global Finance Magazine*, 1/08/17.

Lorié, J., Expert Comment, Afschaffing Nederlandse Dividendbelasting, *BNR Nieuwsradio*, 8/11/17.

Lorié, J., Expert Comment, Ze zijn er wel degelijk: economen die afschaffing van de dividendbelasting een goed idee vinden, *Het Financieele Dagblad*, 9/11/17.

Lorié, J., Expert Comment, Nederlandse faillissementen ver beneden niveau van voor crisis, RTLZ, 23/11/17.

10. HUMAN CAPITAL

Subprogrammes:	TIER, AIID, ACAM
Programme director:	Prof. dr. E. Plug
Section:	Microeconomics
JEL-classification:	I, J, L
Starting date:	2001
Website:	www.ase.uva.nl/hum

10.1 MEMBERS OF THE RESEARCH GROUP AND RESEARCH IN FTES

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Albrecht, S.	msc	phd	0,80	0,80	0,63	1
Booij, A.S.	dr	ud	0,03	0,18	0,43	1
Geijtenbeek, L.	msc	phd	0,53	0,40	0,04	1
Hartog, J.	prof. dr.	guest	0,00	0,00	0,00	1
Ketel, N.	msc	guest	0,00	-	-	1
Meulen, S. ter	msc	phd	-	-	0,27	1
Oosterbeek, H.	prof. dr.	hgl	0,50	0,50	0,50	1
Peter, N.	msc	guest	0,00	0,00	-	1
Plug, E.J.S.	dr.	hgl	0,50	0,50	0,50	1
Praag, B.M.S. van	prof. dr.	guest	0,00	0,00	0,00	1
Rossi, P.	dr.	ud	-	0,17	0,50	1
Ziegler, L.	msc	phd	0,40	0,27	-	1
Ziegler, L.	msc	guest	-	0,00	0,00	1
<u>Subprogramme TIER</u>						-
Booij, A.S.	dr	ud	0,53	-	-	2
Groot, W.	prof. dr.	hgl	-	0,20	0,20	2
Hogendoorn, B.	dr.	oz	-	0,33	0,67	2
Maassen van den Brink, H.	prof. dr.	hgl	0,53	0,53	0,69	2
Nessler, C.	dr.	oz	-	0,25	1,00	2
Tomini, F.	dr.	oz	-	1,00	0,50	2
Vooren, M. van	dr.	oz	-	0,17	0,80	2
<u>Subprogramme AIID</u>						-
Pradhan, M.P.	prof. dr.	hgl	0,15	0,15	0,15	1
Pradhan, M.P.	prof. dr.	hgl	0,20	0,20	0,20	3
Total 1st flow of funds			2,91	2,97	3,02	
Total 2nd flow of funds			1,06	2,48	3,86	
Total 3rd flow of funds			0,20	0,20	0,20	
Total 1st f.o.f. excl. PhD's			1,18	1,50	2,08	
Total all flows of funds			4,17	5,65	7,08	
PhD students			1,73	1,47	0,94	

10.2 PROGRAMME DESIGN

Objective

The program is an empirically driven research program which relies on micro-econometric techniques to study important microeconomic issues in the areas of labour economics, economics of education, family economics, and development economics. Particular emphasis is paid to the identification of causal mechanisms, the analysis of existing policies and policy changes on a variety of microeconomic outcomes, and the design and implementation of experiments to carefully test predictions of microeconomic/behavioural theories and regularities evaluate policy interventions and their microeconomic consequences.

Motivation

Microeconomic models play an important role in understanding individual behavior in many economic areas; that is, predictions taken from microeconomic theories are often used to explain and understand individual economic circumstances, how differences between individuals can possibly account for differences in economic outcomes, and to what extent policies can influence individual economic circumstances. But predictions are not easily verified and possibly false, with huge consequences for (the development of) microeconomic theory, policy and policy design. It is therefore crucial to test predictions of individual economic behaviour with careful empirical work, using the most rigorous methods in applied micro-econometrics.

Themes

The human capital group is originally a labour orientated economics program which investigates various aspects of labour economics. Over the years, however, the human capital group has extended its range of topics in applied microeconomics, covering the fields of labour economics, economics of education, family economics, and development economics.

Organization

The human capital group is part of the larger microeconomics section. Its members are further affiliated with three research groups: ACAM, TIER, and AIID.

ACAM (Amsterdam Center of Applied Microeconometrics) is a joint venture of the University of Amsterdam and the VU University Amsterdam. ACAM is founded in 2015 and hosts researchers who are specialized in empirical research in labor economics, health economics, family economics, the economics of education and development economics. These researchers all combine academic rigor with policy relevance. Publications of ACAM researchers find their way into the top economics journals (AER, JPE, QJE, REStud). The strong collaboration between UvA and VU members shows through a joint seminar series, joint PhD supervision, and work-in-progress meetings. ACAM researchers include Erik Plug, Hessel Oosterbeek, Adam Booij, Pauline Rossi, and Thomas Buser, Elisabeth Artmann, and Simon ter Meulen.

TIER (Top Institute for Evidence Based Education Research) is founded in 2008. It aims to contribute to the improvement of the quality of education in the Netherlands by promoting the evidence-based approach as a guiding principle in education policy and practice. TIER is funded externally. Henriette Maassen van den Brink is the director of TIER Amsterdam and largely responsible for attracting large external grants. Other TIER staff members include Wim Groot, Melvin van Vooren, Florian Tomini, Christian Nessler, and Bram Hogendoorn.

AIID (Amsterdam Institute for International Development) is also a joint initiative of the University of Amsterdam and the VU University Amsterdam. AIID is a multidisciplinary research network with

a strong focus on generating evidence to improve the design of policies to reduce poverty. AIID members are Menno Pradhan and Emily Berkhout.

10.3 PROGRAMME EVALUATION

The human capital group is a small-scale research programme. In 2017, the human capital group changed in composition. On the one hand, we say goodbye to several human capital members. Lennart Ziegler is currently working at University of Vienna as assistant professor (tenure track). Sabine Albrecht has accepted an offer from Queensland University of Technology, Brisbane Australia (post doc). TIER members Florian Tomini, Christian Nessler, and Bram Hogendoorn left. On the other hand, we welcome two new human capital members. Emily Berhout joined us as a first year PhD student (supervisors Hessel Oosterbeek and Menno Pradhan). Also Simon ter Meulen joined us as a first year PhD student (supervisors Hessel Oosterbeek and Bas van der Klaauw).

The year 2017 has been an excellent year in terms of scientific output. Highlights include the multiple top 5 publications: Adam Booij and Hessel Oosterbeek in the *Review of Economic Studies*, Erik Plug in the *American Economic Review*, and Menno Pradhan with an article accepted in the *Quarterly Journal of Economics*. We further congratulate Pauline Rossi for being awarded a VENI grant from NWO, which is a 3-year personal grant. Despite its size, the scientific output of the human capital group is outstanding.

The human capital group provides a stimulating research environment. This environment is partially shaped through national and international connections, external seminar series, internal work-in-progress meetings, and international visitors. Human capital members have close research contacts with researchers at ASE, Free University Amsterdam and Tinbergen Institute, work together with researchers from Europe and US, and are regularly invited to give seminars and (keynote) speeches throughout the world. Members of the human capital group organize a successful weekly seminar series at Tinbergen Institute. The seminar series is internationally renowned. Members of the human capital group (including senior researchers, PhD students and visitors) also come together weekly to discuss their work in various stages.

The work of human capital members also addresses practical policy issues with societal relevance. In addition, most research is empirically orientated and can be formulated such that it is relatively easy to comprehend for policy makers. Members of the human capital group are in close contact with the Ministry of Education, Culture and Science and regularly come together to communicate their scientific work with insights and recommendations. Members are also frequently invited to consult on a variety of governmental policy issues. Henriette Maasen van den Brink is member of the Amsterdam Economic Board which strives to stimulate and support sustainable collaboration, innovation and growth in the Amsterdam region, and strengthen international competitiveness. Henriette Maassen van den Brink has also been appointed chair of the Education Council (Onderwijsraad) which is an independent governmental advisory board that advises the ministers, parliament and local authorities. Hessel Oosterbeek is advising the municipalities of Amsterdam and Utrecht on how to re-organize school assignment procedures. Erik Plug is the president of the European Association of Labour Economists, which is an association of about 800 scientists working in field of labour economics (or related to labour economics).

The human capital group attracts and delivers many good PhD students. This year, the human capital group placed two of their PhD students well (University of Vienna and Queensland University of Technology, Brisbane).

In sum, the human capital group experienced an outstanding year in terms of academic output. While small, the group's interests and scientific methods are internally coherent and clear; that is, the human capital research programme covers mainstream topics in applied microeconomics (including the

economics of education, family and demographic economics, health economics, labor economics and development economics) with a strong focus on microeconometrics.

This evaluation can be summarized in the following SWOT analysis:

Strengths: high quality research addressing issues of societal relevance; stimulating research environment; good reputation; good placement record of former PhD students; internal coherent and visible research theme; successful history in attracting external funds (TIER).

Weaknesses: too small (see also threats).

Opportunities: we have successfully sought closer collaboration with labour economics group at Free University Amsterdam (ACAM); with Pauline Rossi and Menno Pradhan we may further seriously develop the track Development Economics.

Threats: economics as a science has evolved in a more empirically orientated field of science; this is why most (serious) economic departments offer a more empirically orientated curriculum to economics students and have sizable groups of empirically orientated microeconomists. In our department, the increasing empirical importance is not reflected in our curriculum, where we as a small-scale research programme are practically invisible.

10.4 RESOURCES AND FUNDING

TIER-research is currently funded by the local municipality of Amsterdam. Over a period of 5 years (2015-2020) TIER will receive €5.3 million. Two PhD students (Elisabeth Artmann and Simon ter Meulen) are co-financed with Free University Amsterdam (VU). Pauline Rossi has received a NWO VENI grant. Several visiting researchers participate in the program, without financial compensation. Menno Pradhan is a principal investigator funded by AIGHD.

10.5 OUTPUT

Key publications

- Booij, A., Leuven, E. & Oosterbeek, H. (2017). Ability peer effects in university: Evidence from a randomized experiment. *Review of Economic Studies*, 84, 547-587.
- Buser, T., Niederle, M. & Oosterbeek, H. (2014). Gender, competitiveness and career choices. *Quarterly Journal of Economics*, 129, 1409-1447.
- Brinkman, S., Hasan, A., Jung, H., Kinnell, A. & Pradhan, M. (2017). The impact of expanding access to early childhood education services in rural Indonesia. *Journal of Labor Economics*, 35 S305-S335.
- Fredriksson, P., Ockert, B. & Oosterbeek, H. (2013). Long-term effects of class size. *Quarterly Journal of Economics* 128. 249-285
- Ketel, N., Leuven, E., Oosterbeek, H. & Van der Klaauw, B. (2016). The returns to medical school: Evidence from admission lotteries. *American Economic Journal: Applied Economics*, 8, 225-254.
- Ketel, N., Linde, J., Oosterbeek, H. & Van der Klaauw, B. (2016). Tuition fees and sunk-cost effects. *Economic Journal*, 126, 2342-62.
- Lundborg, P., Plug, E. & Wurz Rasmussen, A. (2017). Can women have children and a career: IV evidence from IVF treatments. *American Economic Review*, 107, 1611-1637.
- Plug, E., Webbink, D. & Martin, N. (2014). Sexual Orientation, prejudice and segregation. *Journal of Labor Economics*, 32, 123-159.

Pradhan, M., Suryadarma, D., Beatty, A., Wong, M., Alisjahbana, A., Gaduh, A. & Prama Artha, R. (2014). Improving educational quality through enhancing community participation: Results from a randomized field experiment in Indonesia. *American Economic Journal: Applied Economics*, 6, 105-126.

Forthcoming

- Berry, J., Karlan, D. & Pradhan, M. The Impact of Financial Education for Youth in Ghana. *World Development*, 102, 71-89.
- Buser, B., Geijtenbeek, L. & Plug, E. Sexual orientation, competitiveness, and income. *Journal of Economic Behavior & Organization*.
- Geijtenbeek, L., & Plug, E. Is there a penalty for registered women? Is there a premium for registered men? Evidence from a sample of transsexual workers. *European Economic Review*.
- Oosterbeek, H. & Ruijs, N. School choice in Amsterdam: Which schools are chosen when school choice is free? *Education Finance and Policy*.
- Oosterbeek, H., Sonnemans, J. & Veldhuizen, R. van. Peers at work: Evidence from the lab. *PLOS ONE* 13 (2), 2018.
- Ree, J. de, Muralidharan, K., Pradhan, M. & Rogers, H. Double for nothing? Experimental evidence on an unconditional teacher salary increase in Indonesia. *Quarterly Journal of Economics*.

Publications in numbers

Output type	Classification	#
Articles in journals	Refereed	7
	Non-refereed	1
	Professional	0
	Popular	0
Books or book chapters	Refereed	0
	Non-refereed	0
	Professional	0
	Popular	0
Conference proceedings		0
PhD theses		1
Total		9

Article in journal – refereed

- Booij, A. S., Leuven, E., & Oosterbeek, H. (2017). Ability Peer Effects in University: Evidence from a Randomized Experiment. *The Review of Economic Studies*, 84(2), 547-578.
- Brinkman, S. A., Hasan, A., Jung, H., Kinnell, A., & Pradhan, M. (2017). The Impact of Expanding Access to Early Childhood Education Services in Rural Indonesia. *Journal of labor economics*, 35(S1), S305-S335.
- Brinkman, S., Hasan, A., Jung, H., Kinnell, A., Nakajima, N., Pradhan, M. (2017). The role of preschool quality in promoting child development: evidence from rural Indonesia. *European Early Childhood Education Research Journal*, 25(4), 483-505.
- Buser, T., Oosterbeek, H., Plug, E., Ponce, J., & Rosero, J. (2017). The impact of positive and negative income changes on the height and weight of young children. *The World Bank Economic Review*, 31(3), 786-808.

- Hartog, J., & Raposo, P. (2017). Are starting wages reduced by an insurance premium for preventing wage decline? Testing the prediction of Harris and Holmstrom (1982). *Labour Economics*, 48, 105-119.
- Schweri, J., & Hartog, J. (2017). Do wage expectations predict college enrollment? Evidence from healthcare. *Journal of Economic Behavior & Organization*, 141, 135.
- Lundborg, P., Plug, E., & Rasmussen, A. W. (2017). Can women have children and a career? IV evidence from IVF treatments. *American Economic Review*, 107(6), 1611-1637.

Article in journal – non-refereed

- Hartog, J. (2017). Verkiezingsprogramma's over immigratie: bijstellen of de beuk er in? *Demos*, 33(2), 1.

Dissertation - internally prepared

- Hidalgo Saá, D. (2017). Essays in economics of education and training.

Talk or presentation

- Rossi, P. (Speaker), CSAE conference, 2017.
- Rossi, P. (Speaker), Economics and Sociology Workshop, 2017.
- Rossi, P. (Speaker), EEA conference and WinE workshop, 2017.
- Rossi, P. (Speaker), LEM Seminar, 2017.
- Rossi, P. (Speaker), TCD-LSE-CEPR workshop, 2017.
- Rossi, P. (Speaker), UNU-WIDER seminar, 2017.

11. EXPERIMENTAL & POLITICAL ECONOMICS (CREED)

Programme Director Prof. dr. J.H. Sonnemans
 Section: Microeconomics
 JEL-classification: D7, D8
 Starting date: 1991
 Websites: www.ase.uva.nl/epe
www.creedexperiment.nl/creed

11.1 MEMBERS OF THE RESEARCH GROUP AND RESEARCH IN FTES

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Akdeniz, A.	msc	phd	-	-	0,27	1
Bault, N.G.J.	dr.	guest	0,00	-	-	1
Dogan, G.	dr.	ud	0,13	-	-	1
Dreu, C. de	prof. dr.	hgl	-	0,20	0,20	1
Engelmann, J.	dr.	uhd	-	0,80	0,80	1
Gneezy, U.	prof. dr.	hgl	0,20	0,20	0,19	1
Gomez Martinez, F.	msc	phd	0,80	0,53	-	1
He, S.	msc	phd	0,80	0,53	-	1
Hoyer, M.	msc	phd	0,53	-	-	1
Hu, A.	dr.	oz	0,80	0,56	0,19	2
Ioannidis, K	msc	phd	-	-	0,13	1
Jagau, S.	msc	phd	0,27	0,80	0,80	1
Kamm, A.	msc	phd	0,53	-	-	1
Kobis, N.	dr.	postdoc	-	0,27	0,80	2
Kopányi-Peuker, A.	msc	phd	0,45	-	-	2
Lebreton, M.	dr.	oz	-	1,00	1,00	2
Leib, M.	msc	phd	-	0,80	0,80	2
Loerakker, B.	msc	phd	0,60	-	-	1
Offerman, T.J.S.	prof. dr.	hgl	0,50	0,50	0,50	1
Onderstal, A.M.	dr.	ud	0,20	0,20	0,20	1
Nelidov, V.	msc	phd	-	0,27	0,80	1
Rilovic, A.	msc	phd	0,80	0,80	0,53	1
Romagnoli, G.	dr.	ud	-	0,17	0,50	1
Schram, A.J.H.C.	prof. dr.	hgl	0,40	0,20	0,20	1
Shalvi, S.	dr.	uhd	-	0,80	0,80	2
Smerdon, D.	msc	phd	0,80	0,80	-	1
Sonnemans, J.	prof. dr.	hgl	0,50	0,50	0,50	1
Sorraperra, I.	dr.	postdoc	-	0,27	0,80	2
Ting, C.	msc	phd	-	0,27	0,80	1
Ule, A.	dr.	ud	0,13	0,00	0,03	1
Veelen, C.M. van	prof. dr.	hgl	0,50	0,50	0,50	1
Weber, M.	msc	phd	0,40	-	-	2
Weele, J. van der	dr.	postdoc	0,53	-	-	1
Weele, J. van der	dr.	ud	0,17	0,50	0,50	1
Winden, F.A.A.M. van	prof. dr.	hgl	0,07	0,03	-	1

Winden, F.A.A.M. van	prof. dr.	guest	-	0,00	0,00	1
Woerner, A.	msc	phd	0,27	0,80	0,80	1
			Total	Total	Total	
Name	Title	Function	2015	2016	2017	Funding
Zheng, J.	msc	phd	0,80	0,53	-	1
Total 1st flow of funds			9,53	9,93	8,25	
Total 2nd flow of funds			1,65	2,90	4,39	
Total 3rd flow of funds			0,00	0,00	0,00	
Total 1st f.o.f. excl. PhD			3,33	4,60	4,12	
Total 1st-3rd flow of funds			11,18	12,83	12,64	
PhD students			7,05	6,13	4,93	

11.2 PROGRAMME DESIGN

Objective

Improving the understanding of the behavioural determinants and consequences of economic decision making by (a) focusing on political economic issues, (b) allowing for bounded rationality, and (c) using laboratory experimentation as research method.

Motivation

Political decision making plays an important role in economies. Governments, for example, are essential for the functioning of markets, may be called upon to correct for market failures, but also have their own dynamics. Positive welfare effects of policies cannot be taken for granted. It is, therefore, important to study political decision making and the way in which policies can be applied beneficially. These observations provide the motivation for the first project: “Economics of political decision making”, a long standing project at the FEB dating back to 1983. It is related to public choice and the more recent upsurge in political economics.

Economic models, also when concerned with political decision making, typically make strong assumptions about the rationality, sophistication, and selfishness of individual behaviour. Experimental and other empirical evidence suggests, however, that the predictive power of the standard ‘homo economicus’ model is often disappointing and depends on the institutional character of the decision making environment. There is a need for greater knowledge and a more satisfactory treatment of the bounds on rationality generated by the nature of cognition and emotion, and the influence of institutions. This motivates the second project: “Bounded rationality and institutions”, which fits into the emerging field of behavioural economics.

For the advancement of theory, empirical feedback is crucial. This may hold in particular for new research areas, when sorting out the most promising ways to go. Empirical analysis is seen as an important ingredient of this programme. For many of the issues studied in the aforementioned two projects, however, adequate field data are hard to come by or even nonexistent. Laboratory experimentation is a helpful complementary research method, especially in these cases, for exploration or the testing of models focusing on fundamental behavioural aspects or mechanisms. This motivates the third project: “Experimental economics”, which is stimulated by, and provides feedback for, the other two projects.

Institutional embedding

The research of this programme is carried out within the Center for Research in Experimental Economics and political Decision-making (CREED), a research institute of the FEB. CREED was

established in 1991 by a PIONIER-grant from the Netherlands Organisation for the Advancement of Scientific Research (NWO) for the development of experimental economics in the Netherlands. An important facility is the CREED-laboratory for experimental economics, one of the few dedicated computer laboratories in Europe. Its focus on political decision making and experimental economics distinguishes CREED internationally.

Projects

I Economics of political decision making

This project is concerned with the demand for and the endogenous supply of government policies, the ways in which coordination takes place through the political decision-making process, and the effects thereof on the economy. Major research topics are:

- Political participation and influence (voting, activity and influence of interest groups);
- Interaction between the public sector and the private sector (e.g. the development of social capital and its importance for the provision of public goods);
- Political economy of public and private institutions (e.g. issues of fiscal federalism).

II Bounded rationality and institutions

In this project fundamental aspects of individual decision making, with economic relevance, are investigated. More particularly, attention is focused on the impact of cognitive limitations and emotions. In addition, responses to the complexity and institutional characteristics of the decision environment are studied. Among the topics investigated are:

- Group formation in complex environments (e.g. development of political preferences through social interaction, development of interest groups);
- Economic significance and modelling of emotions (e.g. anger, anxiety, happiness);
- Performance of various auction formats;
- Irrationalities in risk attitudes, and efficiency gains by avoiding or reckoning with these.

III Experimental economics

The main purpose of laboratory experiments in economic research is to create a (political) economic process in a laboratory environment which allows for sufficient control and accurate measurement. Experiments are used for three purposes: (a) the testing of behavioural assumptions and predictions of existing (competing) theories; (b) the searching for facts that are instrumental in the construction of descriptive and explanatory theories; and (c) the evaluation of (new) institutions to assist policy makers. Research in this project is particularly stimulated by, and provides feedback for, the aforementioned two projects. Major lines of research are:

- Voting and electoral competition (behaviour of voters and political candidates/parties);
- Lobbying and political pressure (ways and means, and determinants of effectiveness);
- Emotions and economic behaviour (impact, and modelling);
- Markets and institutions (functioning of markets and, the design of, institutions);
- Evolution of cooperation (development of cooperative behaviour over time);
- Biases in risk attitudes.

11.3 PROGRAMME EVALUATION

In 2017 we welcomed 3 new PhD students. Konstantinos (Kostas) Ioannides will be supervised by Theo Offerman and Randolph Sloof. Asli Akdeniz will be supervised by Matthijs van Veelen and Li-Ang Chang will be supervised by Jan Engelmann.

Two PhD students defended their PhD theses in 2017: Simin He in January and David Smerdon in May 2017. Simin is now assistant professor at the School of Economics, Shanghai University of Finance and Economics and David is now Lecturer (equivalent to Assistant Professor) at the University of Queensland's School of Economics in Australia.

Audrey Hu left CREED in March 2017; she accepted a position as associate professor at the City University of Hong Kong. Jin Di Zheng (PhD defense in February 2018) has accepted a position as assistant professor at the Nanjing Audit University in China.

External recognition of the research undertaken at CREED was received in the form of some important grants:

- Joël van der Weele was awarded a VIDI grant of 800.000 euros for his project "Selective Attention and Economic Decisions".
- Jan Engelmann, Maël Lebreton and some others received an ABC project-grant for their proposal "Correcting over- and under-confidence: can calibration be trained?".
- Maël Lebreton was rewarded a 2017 SNSF Ambizione, good for him but sad for us, because it means that he will leave CREED for Geneva in September 2018.
- Sander Onderstal participates in an European project about sustainable food (SUSFOOD2) and is awarded 250.000 euro for a two year postdoc position who will do lab and field experiments.
- Margarita Leibson received a travel grant from the European Association for Social Psychology for her visit to the University of Pennsylvania (Wharton Business School) and the SJDM meeting during the fall (Sep. to Dec. 2017).
- Carsten de Dreu won the Carole and Ed Diener Award for Social Psychology from the Society for Personality and Social Psychology.

In the summer of 2017 the new communication was built on the 7th floor of the E2-building. It consists of 16 soundproof cubicles, each with a computer, camera, microphone, and a box with a button to ask attendance of the experimenter.

A series of top-level publications (14 published plus 13 accepted for publication) include articles in Management Science, Journal of Finance, Economic Journal, Nature Human Behaviour, Journal of Economic Theory, and Journal of the European Economic Association.

External recognition of the research undertaken at CREED was received in various other ways as well. These include numerous invitations to present seminars or keynote lectures and various associate editorships.

Research contacts were continued, i.a., by a successful Tinbergen seminar series that included presentations by renowned scholars such as Ed Hopkins (University of Edinburgh), Sandro Ambuehl (University of Toronto), Jean-Robert Tyran (University of Vienna), Heather Royer (UC Santa Barbara), Sanjeev Goyal (University of Cambridge), Alan Sanfey (Radboud Universiteit Nijmegen), Martijn van den Assem (Vrije Universiteit Amsterdam), Luis Santos-Pinto (University of Lausanne), Severine Tousseart (London School of Economics), Heikki Rantakari (University of Rochester), Gary Charness (UCSB), Dana Sisak (Erasmus University Rotterdam), Marie Claire Villeval (University of Lyon), Jason Dana (Yale University), Michaela Pagel (Columbia Business School), Alex Possajennikov (University of Nottingham), and Wieland Mueller (University of Vienna).

In October 2017 a workshop on "Moral Behavior and Calculated Ambiguity", was organized by Shaul Shalvi and Joël van der Weele. The line-up of speakers included Kiryl Khalmetski (University of Cologne), Florian Engl (University of Cologne), Eleonora Freddi (Tilburg University), Björn Bartling (University of Zürich), Christine Exley (Harvard University) and Jason Dana (Yale University).

CREED's participation in the Cognitive Science Center Amsterdam (CSCA) continued, as did our yearly PhD exchanges with the Universities of Nottingham and East Anglia. These exchanges provide excellent opportunities for CREED PhD students to present their work (at all stages of the project) to an audience consisting of PhD students and world-renowned professors of the participating institutes. Finally, Jeroen van de Ven and Arthur Schram organized a summer school on Experimental Economics.

11.4 RESOURCES AND FUNDING

The program again received modest funding from the research institute ASE-RI, which was largely spent to cover (part of the) traveling costs to attend conferences. Additional means were obtained from external funding and the Tinbergen Institute (for PhD-students). Substantial additional means came from the UvA-Research Priority Area Behavioral Economics. This provides a solid foundation for paying participants in experiments at the CREED laboratory.

11.5 OUTPUT

Key publications

- De Dreu, Carsten K.W. , H. Steven Scholte, Frans A.A.M. van Winden, and K. Richard Ridderinkhof (2015). Oxytocin Tempers Calculated Greed but not Impulsive Defense in Predator-Prey Contests *Social Cognitive and Affective Neuroscience* 10, 721-728.
- Gneezy, U., Imas, A., & Madarász, K. (2014). Conscience accounting: Emotion dynamics and social behavior. *Management Science*, 60(11), 2645-2658.
- Grossman, Zachary and Joël J. van der Weele (2017). Self-image and willful ignorance in social decisions *Journal of the European Economic Association* 15,173-217.
- He, Simin, Theo Offerman and Jeroen van de Ven (2017) The Sources of the Communication Gap *Management Science* 63, 2833-2846.
- Jagau, Stephan and Matthijs van Veelen (2017). A general evolutionary framework for the role of intuition and deliberation in cooperation *Nature Human Behaviour* 1, 0152 (2017).
- Weber, Matthias and Arthur Schram (2017). The Non-Equivalence of Labor Market Taxes: A Real-Effort Experiment *The Economic Journal* 127, 2187-2215.

Forthcoming

- Buser, T., Gerhards, L., & van der Weele, J. Responsiveness to feedback as a personal trait. *Journal of Risk and Uncertainty*.
- Abbink, K, Bosman, R., Heijmans, R. Winden, F. van. Disruptions in large value payment systems: An experimental approach *International Journal of Central Banking*.
- Brebner, S. and Sonnemans, J.. Does the elicitation method impact the WTA/WTP disparity? *Journal of Behavioral and Experimental Economics*.
- Hu, A., Offerman, T. and Zou, L.. How Risk Sharing May Enhance Efficiency in English Auctions *Economic Journal*.
- Jagau, S. and Offerman, T. Defaults, normative anchors and the occurrence of risky and cautious shifts *Journal of Risk and Uncertainty*.
- Lacomba, J.A., Lagos, F., Reuben, E. and Winden, F. van. Decisiveness, Peace, and Inequality in Games of Conflict *Journal of Economic Psychology*.
- Leeuwen, B. van, Noussair, C., Offerman, T., Suetens, S., Veelen, M. van and Ven, J. van de. Predictably Angry: Facial cues provide a credible signal of destructive behavior *Management Science*.

- Loerakker, B., and Winden, F. van. Emotional Leadership in an Intergroup Conflict Game Experiment *Journal of Economic Psychology*.
- Schram, A., Brandts, J. and Gerxhani, K. Social-Status Ranking: A Hidden Channel to Gender Inequality under Competition *Experimental Economics*.
- Veldhuizen, R. van and Sonnemans, J. Nonrenewable Resources, Strategic Behavior and the Hotelling Rule: An Experiment *Journal of Industrial Economics*.
- Weber, M., Duffy, J., and Schram, A. An Experimental Study of Bond Market Pricing. *Journal of Finance*.

E-pub ahead of print

- Hu, A., Offerman, T., & Zou, L. (2017). How risk sharing may enhance efficiency of English auctions. *Economic Journal*.
- Köbis, N. C., Laakasuo, M., Palomäki, J., & Jokela, M. (2017). Money for microbes—Pathogen avoidance and out-group helping behaviour. *International Journal of Psychology*.

Publications in numbers

Output type	Classification	#
Articles in journals	Refereed	32
	Non-refereed	0
	Professional	0
	Popular	0
Books or book chapters	Refereed	1
	Non-refereed	0
	Professional	1
	Popular	0
Conference proceedings		1
PhD theses		2
Total		37

Article in journal – refereed

- Bardsley, N., & Ule, A. (2017). Focal Points Revisited: Team Reasoning, the Principle of Insufficient Reason and Cognitive Hierarchy Theory. *Journal of Economic Behavior & Organization*, 133, 74-86.
- Bassarak, C., Leib, M., Mischkowski, D., Strang, S., Glöckner, A., & Shalvi, S. (2017). What Provides Justification for Cheating: Producing or Observing Counterfactuals? *Journal of Behavioral Decision Making*, 30(4), 964-975.
- Bault, N., Fahrenfort, J.J., Pelloux, B., Ridderinkhof, K.R., & van Winden, F. (2017). An affective social tie mechanism: Theory, evidence, and implications. *Journal of Economic Psychology*, 61, 152-175.
- Boot, N., Baas, M., van Gaal, S., Cools, R., De Dreu, C. (2017). Creative cognition and dopaminergic modulation of fronto-striatal networks: Integrative review and research agenda, *Neuroscience and Biobehavioral Reviews*, 78.
- Boot, N., Baas, M., Mühlfeld, E., de Dreu, C., van Gaal, S. (2017). Fronto-parietal neural oscillations in the delta band dissociate convergent from divergent thinking modes during creative idea generation, *Neuropsychologia*, 104.
- Casal, S., DellaValle, N., Mittone, L., & Soraperra, I. (2017). Feedback and efficient behavior. *PLoS ONE*, 12(4).
- Daughters, K. et al. "Oxytocin modulates third-party sanctioning of selfish and generous behavior within and between groups". *Psychoneuroendocrinology*, 77, 18-24.

- Drouvelis, M., & Sonnemans, J.H. (2017). The Endowment Effect in Games. *European Economic Review*, 94, 240-262.
- Engelmann, J.B., Berns, G.S., & Dunlop, B.W. (2017). Hyper-responsivity to losses in the anterior insula during economic choice scales with depression severity. *Psychological Medicine*, 47(16), 2879-2891.
- Gocłowska, M.A. et al. "Why schema-violations are sometimes preferable to schema-consistencies: The role of interest and openness to experience.". *Journal of Research in Personality*, 66, 54-69.
- Gordon-Hecker, T., Rosensaft-Eshel, D., Pittarello, A., Shalvi, S., & Bereby-Meyer, Y. (2017). Not taking responsibility: Equity trumps efficiency in allocation decisions. *Journal of Experimental Psychology. General*, 146(6), 771-775.
- Gross, J. and De Dreu, C.K.W. (2017) Oxytocin modulates trait-based rule following. *Social Cognitive and Affective Neuroscience*, 12(3), 427-435.
- Grossman, Z., & van der Weele, J.J. (2017). Self-image and willful ignorance in social decisions. *Journal of the European Economic Association*, 15(1), 173-217.
- Grossman, Z., & van der Weele, J.J. (2017). Dual-Process Reasoning in Charitable Giving: Learning from Non-results. *Games*, 8(3), [36].
- Gündemir, S., Dovidio, J. F., Homan, A. C., & De Dreu, C.K.W. (2017). The Impact of Organizational Diversity Policies on Minority Employees' Leadership Self-Perceptions and Goals. *Journal of Leadership and Organizational Studies*, 24(2), 172-188.
- He, S., Offerman, T., van de Ven, J., (2017). The Sources of the Communication Gap, *Management Science*, 63, 9.
- Haan, T. de, Offerman, T., & Sloof, R. (2017). Discrimination in the labour market: the curse of competition between workers. *Economic Journal*, 127(603), 1433–1466.
- Jagau, S., & van Veelen, M. (2017). A general evolutionary framework for the role of intuition and deliberation in cooperation. *Nature Human Behaviour*, 1(8), [0152].
- Köbis, N. C., van Prooijen, J.W., Righetti, F., & Van Lange, P.A.M. (2017). The Road to Bribery and Corruption: Slippery Slope or Steep Cliff? *Psychological Science*, 28(3), 297-306.
- Kopányi-Peuker, A., Offerman, T., & Sloof, R. (2017). Fostering cooperation through the enhancement of own vulnerability. *Games and Economic Behavior*, 101, 273-290.
- Kret, M.E. and C.K.W. de Dreu. (2017). Pupil-mimicry conditions trust in partners: Moderation by oxytocin and group membership. *Proceedings of the Royal Society B-Biological Sciences*, 284(1850).
- Lefebvre, G., Lebreton, M.P., Meyniel, F., Bourgeois-Gironde, S., & Palminteri, S. (2017). Behavioural and neural characterization of optimistic reinforcement learning. *Nature Human Behaviour*, 1, [67].
- Levati, M. V., Napel, S., & Soraperra, I. (2017). Collective Choices Under Ambiguity. *Group Decision and Negotiation*, 26(1), 133-149.
- Mulckhuyse, M., Engelmann, J.B., Schutter, D. J. L. G., & Roelofs, K. (2017). Right Posterior Parietal Cortex is involved in disengaging from threat: a 1-Hz rTMS study. *Social Cognitive and Affective Neuroscience*, 12(11), 1814-1822.
- Oostrom, J.K., Köbis, N. C., Ronay, R., & Cremers, M. (2017). False consensus in situational judgment tests: What would others do? *Journal of Research in Personality*, 71, 33-45.
- Robalo, R., Schram, A.J.H.C., & Sonnemans, J.H. (2017). Other-regarding Preferences, In-Group Bias and Political Participation: an experiment. *Journal of Economic Psychology*, 62, 130-154.
- Soraperra, I., Weisel, O., Zultan, R., Kochavi, S., Leib, M., Shalev, H., & Shalvi, S. (2017). The bad consequences of teamwork. *Economics Letters*, 160, 12-15.
- Szycer, D., Lopez Seal, M. F., Sell, A., Lim, J., Porat, R., Shalvi, S., ... Tooby, J. (2017). Support for redistribution is shaped by compassion, envy, and self-interest, but not a taste for fairness. *Proceedings of the National Academy of Sciences of the United States of America*, 114(31), 8420-8425.
- Veelen, M. van, Allen, B., Hoffman, M., Simon, B., Veller, C. (2017). Hamilton's rule, *Journal of Theoretical Biology*, 414.

- Velden, F.S. ten, K. Daughters and De Dreu, C.K.W. (2017). Oxytocin promotes intuitive rather than deliberated cooperation with the in-group". *Hormones and Behavior*, 92, 164-171.
- Weber, M., & Schram, A. (2017). The Non-Equivalence of Labour Market Taxes: A Real-Effort Experiment. *Economic Journal*, 127(604), 2187-2215.
- Wilde, T.R.W. de, Ten Velden, F.S., & De Dreu, C.K.W. (2017). The Neuropeptide Oxytocin Enhances Information Sharing and Group Decision Making Quality. *Scientific Reports*, 7, [40622].

Book chapter - refereed

- Van der Weele, J.J., Flynn, M.P., & van der Wolk, R.J. (2017). Broken Window Effect. In A. Marciano, & G. B. Ramello (Eds.), *Encyclopedia of Law and Economics* New York: Springer.

Book chapter – professional

- Haan, M., Hinloopen, J., & Onderstal, A.M. (2017). Markten: consumenten gedragen zich net als mensen. In *Gedragseconomie en Economisch Beleid: Preadviezen van de Koninklijke Vereniging voor de Staathuishoudkunde* (pp. 60). Amsterdam: Koninklijke Vereniging voor de Staathuishoudkunde.

Conference proceedings – non-refereed

- Köbis, N., & Starke, C. (2017). Why did the Panama Papers (not) shatter the world? The relationship between Journalism and Corruption. In A. K. Schwickerath, A. Varraich, & L-L. Smith (Eds.), *How to research corruption?: Conference Proceedings: Interdisciplinary Corruption Research Forum, June 2016, Amsterdam* (pp. 69-78). Interdisciplinary Corruption Research Network.

Dissertation – internally prepared

- He, S. (2017). *Cooperation, coordination and competition: Theory and experiments*
- Smerdon, D. C. (2017). *‘Everybody’s Doing It’: Essays on trust, social norms and integration*

Talk or presentation

- Onderstal, S. (Speaker), Nobel prize in Economics 2016, University College Utrecht, 1 March 2017.
- Onderstal, S. (Speaker), Een Nobelprijs waar inkoop wat aan heeft! Lessen voor de aanbestedingspraktijk, PIANOo-congres, 19 May 2017.
- Onderstal, S. (Speaker), Can Collusion Promote Corporate Social Responsibility? Evidence from the Lab, Tinbergen Institute, 16 Jun 2017.
- Onderstal, S. (Speaker), Can Collusion Promote Corporate Social Responsibility? Evidence from the Lab, Berlin Behavioral Economics Colloquium and Seminar, 12 July 2017.
- Onderstal, S. (Speaker), Can Collusion Promote Corporate Social Responsibility? Evidence from the Lab, ESA Vienna, 6-9- September 2017.
- Nelidov, V. (Speaker), paper presentation "Hidden Cost of Opportunities", CBESS-CeDEx-CREED Meeting 2017, Nottingham, 16 Jun 2017.
- Shalvi, S. (Speaker), At the root of corruption: A behavioral ethics approach, Interdisciplinary Center Herzliya, 15 Jan 2017.
- Shalvi, S. (Speaker), At the root of corruption: A behavioral ethics approach, Hebrew University of Jerusalem, 16 Jan 2017.
- Shalvi, S. (Speaker), At the root of corruption: A behavioral ethics approach, Bar-Ilan University, 24 October 2017.
- Schram, A. (Speaker), Voter Turnout and Party Choice, University of Milan-Bicocca, Milan, 8 Feb 2017.

- Schram, A. (Speaker), Media Bias and Voting, New York University Abu Dhabi, 8 Mar 2017.
- Schram, A. (Speaker), Media Bias and Voting, European Workshop on Experimental and Behavioral Economics, Betinoro, 26 May 2017.
- Schram, A. (Speaker), Social Status makes women underperform, Concerns for status and social image: Theory, evidence and implications for welfare and policy, Berlin, 8 Jun 2017.
- Schram, A. (Speaker), Media Bias and Voter Behavior, HKUST Hong Kong, 4 Aug 2017.
- Schram, A. (Speaker), Media Bias and Voter Behavior, Workshop on Experimental Social Sciences, Florence, 15 Sep 2017.
- Schram, A. (Speaker), Using Experiments to Understand Voter Behavior, Italian Society for Public Economics, Catania, 21 Sep 2017.
- Schram, A. (Speaker), Voter Turnout and Party Choice, Political Economy of Mixed-member Systems, Bremen, 5 Oct 2017.
- Soraperra, I. (Speaker), The bad consequences of teamwork: does joint effort corrupt more than exposure to corrupt behavior? Fourth International Meeting on Experimental and Behavioral Social Sciences (IMEBESS), Barcelona, 27-29 April 2017.
- Soraperra, I. (Speaker), The bad consequences of teamwork: does joint effort corrupt more than exposure to corrupt behavior? EASP Conference, Grenada, 5-8 July 2017.
- Soraperra, I. (Speaker), Too Lucky to be True. Fairness views under the shadow of cheating, ESA European Meeting, Vienna, 9 September 2017.
- Soraperra, I. (Speaker), Shooting the messenger. A market for willful ignorance, Moral behavior and calculated ambiguity Workshop, 18 October 2017.
- Soraperra, I. (Speaker), Shooting the messenger. A market for willful ignorance, 2nd FELIS-CORTEX workshop on Social Norms and Moral Norms, Lyon, 24 October 2017.
- Ting, C. (Speaker), Incidental anxiety enhances reinforcement learning for gains but not for losses, Donders Discussion 2017, Nijmegen, 27 October 2017.

Publication peer-review and editorial work

- Shalvi, S. (Reviewer), Comprehensive Results in Social Psychology, 2014 – 2017.
- Shalvi, S. (Reviewer), Organizational Behavior and Human Decision Processes, 2015 -.
- Shalvi, S. (Reviewer), Journal of Experimental Social Psychology, 2016 -.
- Shalvi, S. (Reviewer), Personality and Social Psychology Bulletin, 2016 -.
- Schram, A. (Reviewer), International Journal of Public Opinion Research, 2017.
- Schram, A. (Reviewer), European Economic Review, 2017.
- Schram, A. (Reviewer), Nature Human Behaviour, 2017.
- Schram, A. (Reviewer), Social Choice and Welfare, 2017.
- Schram, A. (Reviewer), Econometrica, 2017.

Prize

- Shalvi, S. (Recipient), Best student paper award, 6 September 2017.
- Weele, J. van der (Recipient), VIDI grant, 2017.

12. MARKETS & ORGANIZATIONS

Programme director: Prof. dr. R. Sloof
 Section: Microeconomics
 JEL-classification: L
 Starting date: 2005
 Website: www.ase.uva.nl/mo

12.1 MEMBERS OF THE RESEARCH GROUP AND RESEARCH IN FTES

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Buser, T.	dr.	ud	0,80	0,80	0,53	2
Buser, T.	dr.	uhd	-	-	0,17	1
Czibor, E.	msc	phd	0,53	-	-	1
Dominguez Martinez, S.	dr.	ud	0,25	0,17	0,00	1
Guerriero, C.	dr.	ud	0,38	-	-	1
Hinloopen, J.	prof. dr.	hgl	0,33	-	0,00	1
Hinloopen, J.	prof. dr.	guest	-	0,00	-	1
Kiss, A.	dr.	ud	0,17	0,50	0,50	1
Klein, T.	msc	phd	-	0,27	0,80	1
Koudstaal, M.	msc	phd	0,80	0,27	-	1
Onderstal, S.	dr.	ud	0,30	0,30	0,30	1
Praag, C.M. van	prof. dr.	hgl	0,00	0,00	0,00	1
Rosendahl Huber, L.	msc	phd	0,18	-	-	3
Schinkel, M.P.	prof. dr.	hgl	0,25	0,25	0,25	1
Seldeslachts, J.	dr.	ud	0,02	0,00	0,00	1
Sloof, R.	prof. dr.	hgl	0,50	0,50	0,50	1
Sun, J.	msc	phd	0,27	0,80	0,80	1
Toth, L.	msc	phd	0,60	-	-	1
Treuren, L.	msc	phd	-	-	0,27	1
Ven, J. van de	dr.	uhd	0,50	0,50	0,50	1
Total 1st flow of funds			4,73	3,56	4,09	
Total 2nd flow of funds			0,80	0,80	0,53	
Total 3rd flow of funds			0,18	0,00	0,00	
Total 1st f.o.f. excl. PhD			2,53	2,22	2,22	
Total all flows of funds			5,71	4,36	4,62	
PhD students			2,38	1,34	1,87	

12.2 PROGRAMME DESIGN

Objectives

Broadly defined, the research program on Markets & Organizations aims to improve our understanding of the working of markets and organizations in capturing the economic benefits from collective action and to identify as well as evaluate (policy) interventions that may improve market or organizational performance.

Motivation

The field of Markets and Organizations is broad. Research within the programme is centered around both Industrial Organization, Competition Policy & Regulation (i.e. “markets”), and Organizational Economics. Moreover, given the historical origin of the organizational economics group, there is a close and well-established link with research on the Economics of Entrepreneurship. Three different, but closely interrelated lines of research can thus be delineated.

The first line of research studies the working of imperfectly competitive markets, in particular how firms compete with each other on these markets and what the effects are of policy interventions aimed at affecting market performance. The natural focus is on oligopolies where firms have some market power. Topics of interest include (but are not restricted to) pricing strategies, (tacit) collusion, locational choice, research and development, inter-firm relationships, competition policy, market design, auctions, two-sided markets, network industries, regulatory design and enforcement tools (including detection, fines, leniency programs and settlement).

Within economics organizations can be viewed as a means of achieving the benefits of collective action in situations where the price system fails. The second strand of research within M&O on Organizational Economics is concerned with studying the effective internal functioning of organizations in capturing these benefits. The key focus is on problems that may arise from coordinating and motivating the members of an organization to create economic value through superior organizational performance and to study potential remedies for these problems.

The third line of research on the Economics of Entrepreneurship focuses on studying (the determinants of) the choices, behavior and performance of entrepreneurs and on whether and how government policy may be effective in fostering entrepreneurship.

Methods

Within the M&O program there is an emphasis on both sound empirical work and on applied theory. Empirical analyses primarily focus on the detection and measurement of unbiased effects, either through the use of naturally occurring field data (by means of ‘quasi experiments’ and instrumental variables techniques), field experiments or laboratory experiments. Applied theory typically concerns using the tools from microeconomics and applied game theory to evaluate the impact of either government policy or organizational interventions intended to improve efficiency. Often these models are enriched by incorporating insights from behavioural economics, as empirical evidence has mounted that people do not always satisfy the rationality assumptions made in traditional economic models. Research within the M&O group is always done with a keen eye towards societal relevance, ranging from competition policy, practical auction design in procurement, to the effectiveness of entrepreneurship education in stimulating entrepreneurial intentions.

Projects

A wide variety of topics and questions are studied within the M&O research programme, which by and large can be divided along the three different lines of research outlined above. Each of these can be further subdivided into a number of different research projects.

1. Industrial Organization, Competition Policy & Regulation

1.1 Competition policy & Regulation

Current empirical projects on competition policy deal with potential deterrence effects of merger policy tools, based on data from the U.S. Department of Justice and the U.S. Federal Trade

Commission. Furthermore, group members have investigated whether firms that collaborate in research joint ventures, use these collaborations to collude in product markets. In another project, a series of experiments is set up to study the relationship between competition, the nature of competition, the size of a loss and firm profits in insurance markets. Also the impact of antitrust policy at large is investigated. This is done by further refining the methodologies to estimate price cost margins and by applying the methodology to data from e.g. the Indonesian economy. In addition to the nation-wide impact of the introduction of antitrust policy, also the change in the behaviour of targeted firms was investigated by a difference in difference method. Another strand of research focuses on the Dutch mortgage market. An explanation it puts forward for high mortgage rates is state aided price coordination in Dutch mortgage banking; at some point in time three out of the four main competitors received state aid, prohibiting them to undercut rates of firms that do not get state aid. This allowed the single remaining big player to effectively act as a price leader and implicit coordinator of collusive pricing. Finally, a recent line of research focuses on detecting (coordinated) manipulation of benchmark interest rates like Libor and Euribor.

1.2 Research and development

Research cooperation is key for businesses to successfully innovate and prosper, and firms increasingly rely on extensive networks to achieve their goals. It is, however, still poorly understood how these R&D cooperatives are formed, how they evolve, what their impact is on R&D activities, and what should constitute an optimal R&D policy. These questions drive several research lines. For instance, group members are developing a theoretical framework of research network formation. This framework is tested against a database that includes all large research collaborations in the U.S. Other group members assess the welfare implications of sustaining R&D cooperatives. Again, the fundamental trade-off between static and dynamic efficiency is addressed, giving additional insights as to what should constitute an optimal R&D-stimulating policy.

1.3 Auctions

In the past few decades, the study of auctions has become one of the most active research areas in economic sciences. We aim at answering questions such as: How to prevent cartel formation in auctions? What is the effect of limited liability on bidding behaviour? How to design auctions of multiple objects? What are optimal mechanisms in quasi-markets such as welfare-to-work markets and health care markets? What is the effect of license auctions on the performance of markets? For example, groups members have studied experimentally the impact leniency programmes on the collusive properties of different auction types. Others have studied fundraising mechanisms on charitable giving in a door-to-door fundraising field experiment. The starting point here is that people are not purely selfish because if they were they would donate nothing to charity. Finally, recent research attention has been devoted to crowdfunding, where the focus is how to best structure it as to maximize funding. Here a theory driven (mechanism design) approach is combined with experimental testing in the lab.

1.4 Economic analysis in competition cases

Increasingly does economic analysis play a decisive role in competition law enforcement. In competition cases, economic arguments in market definition, for example in two-sided markets, the theory of harm, or an efficiency defense can be decisive in the finding of an infringement and the design of remedies. Since business strategies constantly evolve, the thinking about possible anticompetitive aspects of them is under constant development as well. Topics studies in this research focus range from quantifying the efficiency defense in merger control and the identification of abuse of dominance strategies, to analyzing the effects of State aid remedies and the calculation of cartel damages.

2. Organizational Economics

2.1 Decision rights and internal organization

A key feature of organizational architecture is the division of tasks and responsibilities within organizations: who does and decides on what? Employees lower in the organizational chart typically have better knowledge to take operational decisions, but at the same time have objectives that (may) differ from the interests of the firm. Within this project the tradeoffs that arise in delegating decision authority –like a loss of control versus a loss of initiative– are studied. The focus is in particular on behavioural biases that may affect these tradeoffs; especially when it comes to authority and monitoring non-monetary motives have been found to play a prominent role. Another topic concerns whether (procedural) preferences regarding the way in which decisions are taken affects how efficiently these taken decisions are subsequently implemented.

2.2 Performance measurement and reward systems

A second set of projects within the domain of Organizational Economics is concerned with the design of good performance measures and of appropriate reward systems. Performance measures are for instance evaluated empirically in terms of their noise and their distortions. The research on reward systems focuses predominantly on (among other things) pay-for-performance contracts, career opportunities and promotions, returns to investments in skills acquisition and the interaction between explicit and implicit incentives. Also here a behavioural approach is typically taken, as for instance people often care about how well they fare relative to others.

3. Economics of Entrepreneurship

3.1 Evaluation of entrepreneurship programs

Public policy has increasingly proposed and implemented programmes to encourage entrepreneurship. Most of these programmes are designed to decrease human and financial capital constraints. We aim at measuring the causal effect of these programmes, with a focus on entrepreneurship education, on the intended outcomes by using field experiments.

3.2 The behavioural traits of entrepreneurs

This research aims to identify the defining behavioural traits of entrepreneurs and to establish to what extent these differ from managers. The relevant traits studied include, among other things, attitudes towards risk and losses, overconfidence, intuitive and rational thinking, optimism, willingness to compete and willingness to cooperate in a team. Established entrepreneurs and managers participate in online incentivized tasks designed to measure the relevant traits. In a recent study also future entrepreneurs and future managers are compared in terms of (among others) their temporal preferences.

12.3 PROGRAMME EVALUATION

Turnover

In January 2017 former PhD student Flora Felso defended her thesis on Empirical Studies of Consumer and Government Purchase Decisions. Lukas Tóth and Liting Zhou are expected to defend their theses in 2018. In September 2017 Leonard Treuren joined the research programme as a PhD student under the supervision of Sander Onderstal and Maarten Pieter Schinkel.

Strengths: The group has a very broad orientation, both in terms of the choice of research topics as in terms of methodologies used (theoretical/[lab/field]experimental/empirical). The group is well-

embedded in ASE and in the Tinbergen Institute; group members thus have co-authored papers with many members from other ASE research groups. The research performed by the group is not only of high quality (with key publications appearing in very good journals), but also very visible and of great practical importance (e.g. the work of Schinkel on the Dutch mortgage market and the manipulation of labor). Some of the group members have close links with governmental bodies such as ministries and antitrust agencies.

Weaknesses: There is too little coherence in the broad research program. The group is not very prominent in the arena of theoretical industrial organization and contract theory, except for the field of auction theory. The group has not been very successful in attracting external research grants. Compared to the other two research programs within the microeconomics section, the program has a less well defined and characteristic overarching profile (perhaps partly due to the Organizations branch formerly being part of the Human Capital program as well as the close connections with CREED).

Opportunities: The master tracks most closely connected to the group's research program are stable to growing in size and a new track on Competition Policy has been added. The research program thus has a logical counterpart in teaching and thereby also a sound basis to grow.

Threats: The group has a small-scale, with quite some turnover in the last years. With the planned transfer of Sander Onderstal to the Amsterdam Business School the program becomes even smaller and the link between the constituting Markets and Organizations parts becomes weaker.

Societal relevance

Research by the group on the deterrence effects of merger policy tools and the effectiveness of leniency programs is directly relevant to competition agencies and governmental bodies such as the ACM. Besides, the group's empirical projects target specific markets the functioning of which is of major importance to social welfare, such as the banking sector, insurance markets, retail gasoline pricing and public procurement. For this reason, research by the group regularly features in national newspapers and international magazines. Group members also appear on television to contribute to the debate by commenting on the developments in specific markets and the effects of these on competition. Maarten Pieter Schinkel, for instance, is frequently asked for media appearances commenting on the (non)competitiveness of the Dutch mortgage market. Group members also participate in governmental expert committees and provide targeted advice for particular policy issues. For instance, Sander Onderstal advised the Ministry of Economic Affairs on the design of the auction for mobile telecommunications, and Jo Seldeslachts was a member of the expert committee "Toekomst van toezicht" of the Dutch Wetenschappelijke Raad voor het Regeringsbeleid (WRR). Jeroen Hinloopen has recently become Deputy Director at the CPB.

12.4 RESOURCES AND FUNDING

- Standard funding from TI and ASE-RI
- Some group members (Schinkel) were up till recently partly financed by ACLE
- Funding from research priority area 'Behavioural Economics' for data gathering
- VENI-grant Buser
- Use of and access to CREED lab

12.5 OUTPUT

Key publications

- Bremzen, A., Khokhlova, E., Suvorov, A. and J. van de Ven. (2015). Bad News: An Experimental Study on the Informational Effects of Rewards, *Review of Economics and Statistics* 97, 55-70.
- Buser, T., (2015). The effect of income on religiousness, *American Economic Journal: Applied Economics* 7, 178-195.
- Buser T., Niederle, M. & Oosterbeek, H. (2014). Gender, Competitiveness and Career Choices. *Quarterly Journal of Economics* 129(3), 1409-1447.
- Duso T., Röller L., Seldeslachts J. (2014). Collusion through joint R&D: An empirical assessment. *Review of Economics and Statistics* 96 (2), 349-370.
- Haan, de T., Offerman, T. and R. Sloof, (2017), Discrimination in the labor market: The curse of competition between workers, *Economic Journal* 127, 1433-1466.
- Onderstal, S., Schram, A. J. H. C., & Soetevent, A. R. (2013). Bidding to give in the field. *Journal of Public Economics*, 105, 72-85.

Forthcoming

- Buser, T., Gerhards, L., & van der Weele, J. Responsiveness to feedback as a personal trait. *Journal of Risk and Uncertainty*.
- Hoogendoorn, S., Parker, S.C. and M. van Praag. Smart or diverse start-up teams? Evidence from a field experiment, *Organization Science*.
- Kopányi-Peuker, A., Offerman, T., and R. Sloof. Team production benefits from a permanent fear of exclusion. *European Economic Review*.
- Noussair, C., T. Offerman, S. Suetens, B. van Leeuwen, M. van Veelen, and J. van de Ven. Predictably Angry, *Management Science*.
- Schinkel, M. P., & E., H. Umbrella Effects: Correction and Extension. *Journal of Competition Law and Economics*, 13(1), 185-189.

Publications in numbers

Output type	Classification	#
Articles in journals	Refereed	13
	Non-refereed	0
	Professional	0
	Popular	0
Books or book chapters	Refereed	0
	Non-refereed	0
	Professional	1
	Popular	0
Conference proceedings		0
PhD theses		2
Total		16

Article in journal – refereed

- Belot, M., & van de Ven, J. (2017). How private is private information? The ability to spot deception in an economic game. *Experimental Economics*, 20(1), 19-43.

- Block, J. O., Fisch, C. O., & van Praag, M. (2017). The Schumpeterian entrepreneur: a review of the empirical evidence on the antecedents, behavior and consequences of innovative entrepreneurship. *Industry and Innovation*, 24(1), 61-95.
- Buser, T., Oosterbeek, H., Plug, E., Ponce, J., & Rosero, J. (2017). The impact of positive and negative income changes on the height and weight of young children. *The World Bank Economic Review*, 31(3), 786-808.
- Buser, T., N. Peter and S.C. Wolter. (2017). Gender, competitiveness, and study choices in high school: Evidence from Switzerland". *American Economic Review*, 107(5), 125-130.
- Buser, T., A. Dreber and J. Mollerstrom. (2017). The impact of stress on tournament entry. *Experimental Economics*, 20(2), 506-530.
- de Haan, T., Offerman, T., & Sloof, R. (2017). Discrimination in the labour market: the curse of competition between workers. *Economic Journal*, 127(603), 1433–1466.
- He, S., Offerman, T., van de Ven, J., (2017). The Sources of the Communication Gap, *Management Science*, 63, 9.
- Hinloopen, J., Smrkolj, G., & Wagener, F. (2017). Research and development cooperatives and market collusion: a global dynamic approach. *Journal of Optimization Theory and Applications*, 174(2), 567-612.
- Hinloopen, J. and S. Martin. (2017). Costly location in Hotelling duopoly. *Research in Economics*, 71(1), 118-128.
- Hoogendoorn, S., Parker, S. C., & van Praag, M. (2017). Smart or diverse start-up teams? Evidence from a field experiment. *Organization Science*, 28(6), 1010 - 1028.
- Kopányi-Peuker, A., Offerman, T., & Sloof, R. (2017). Fostering cooperation through the enhancement of own vulnerability. *Games and Economic Behavior*, 101, 273-290.
- Rosendahl Huber, L., Sloof, R., & Van Praag, M. (2017). The effect of incentives on sustainable behavior: evidence from a field experiment. *Labour Economics*, 45, 92-106.
- Schinkel, M. P., & Spiegel, Y. (2017). Can Collusion Promote Sustainable Consumption and Production? *International Journal of Industrial Organization*, 53, 371-398.

Book chapter – professional

- Haan, M., Hinloopen, J., & Onderstal, A. M. (2017). Markten: consumenten gedragen zich net als mensen. In *Gedragseconomie en Economisch Beleid: Preadviezen van de Koninklijke Vereniging voor de Staathuishoudkunde* (pp. 60). Amsterdam: Koninklijke Vereniging voor de Staathuishoudkunde.

Dissertation – internally prepared

- Felső, F. A. (2017). Empirical studies of consumer and government purchase decisions.
- He, S. (2017). Cooperation, coordination and competition: Theory and experiments.

Talk or presentation

- Onderstal, S. (Speaker), Nobel prize in Economics 2016, University College Utrecht, 1 March 2017.
- Onderstal, S. (Speaker), Een Nobelprijs waar inkoop wat aan heeft! Lessen voor de aanbestedingspraktijk, PIANOo-congres, 19 May 2017.
- Onderstal, S. (Speaker), Can Collusion Promote Corporate Social Responsibility? Evidence from the Lab, Tinbergen Institute, 16 Jun 2017.
- Onderstal, S. (Speaker), Can Collusion Promote Corporate Social Responsibility? Evidence from the Lab, Berlin Behavioral Economics Colloquium and Seminar, 12 July 2017.
- Onderstal, S. (Speaker), Can Collusion Promote Corporate Social Responsibility? Evidence from the Lab, ESA Vienna, 6-9- September 2017.
- Schinkel, M. P. (Speaker), Cartel Dating, International Industrial Organization Conference, Boston, 7 April 2017.
- Schinkel, M. P. (Speaker), Sustainability and Collusion, Bergen Center for Competition Law and Economics (BECCL), 25 April 2017.

- Schinkel, M. P. (Speaker), Public Interest Cartels, University of Oxford, 24 June 2017.
- Schinkel, M. P. (Speaker), Platform Monopolization by Narrow-PPC-BPG Combination: Booking et al, International Conference on Competition and Regulation, Crete, 1 July 2017.
- Schinkel, M. P. (Speaker), Collusive Benchmark Rates Fixing, Federal University of Rio de Janeiro, Brazil, 6 November 2017.
- Schinkel, M. P. (Speaker), Cartel Screening Filters, Administrative Council for Economic Defense (CADE), Brazil, 8 November 2017.
- Schinkel, M. P. (Speaker), Collusive Benchmark Rates Fixing, The Centre for Competition Policy at the University of East Anglia, 8 December 2017.

13. SEO ECONOMIC RESEARCH

Subprogrammes:	Labour & Education Financial Markets and Finance Health Care & Social Security Regulatory Economics & Sustainability SEO Aviation Economics Competition, Market & State Global Economics Big Data Science
Programme director:	Prof. dr. B. ter Weel
JEL-classification:	I, J, L, Q, R
Website:	www.seo.nl

13.1 MEMBERS OF THE RESEARCH GROUP AND RESEARCH IN FTES

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Scientific Staff SEO						
Baarsma, B.E.	dr.	oz	1,00	0,08	-	3
Koopmans, C.C.	prof. dr.	hgl	0,80	0,80	0,53	3
Weel, B. ter	prof. dr.	hgl	-	0,33	1,00	3
Global Economics						
Appelman, R.	msc	oz	-	0,33	0,56	3
Oomes, N.A.	dr.	oz	0,70	0,78	1,00	3
Big Data Science						
Brouwer, E.	prof. dr.	hgl	-	-	0,33	3
Labour & Education						
Berg, E. van den	drs.	oz	1,00	1,00	1,00	3
Berkhout, E.E.	drs.	oz	0,75	-	-	3
Bisschop, P.	msc	oz	1,00	1,00	1,00	3
Heyma, A.O.J.	dr.	oz	1,00	1,00	1,00	3
Imandt, G.C.M.	msc	oz	1,00	0,67	-	3
Megens, L.A.		oz	-	0,88	0,67	3
Volkerink, M.D.	msc	oz	0,85	-	-	3
Vriend, S.	msc	oz	0,25	1,00	-	3
Werff, S.G. van der	msc	oz	1,00	1,00	1,00	3
Zwetsloot, I.	msc	oz	-	0,33	1,00	3
Financial markets and Finance						
Biesenbeek, C.	msc	oz	0,25	1,00	1,00	3
Hers, J.F.P.	drs.	oz	-	-	0,58	3
Kerste, M.W.M.	drs.	oz	1	1,00	0,33	3
Weda, J.W.T.	drs.	oz	1	0,79	-	3
Rougoor, W.	msc	oz	1	1,00	1,00	3
Witteman, J.P.	msc	oz	-	0,33	1,00	3
Health Care & Social Security						
Berden, C.B.	dr.	oz	0,63	-	-	3

<i>Name</i>	<i>Title</i>	<i>Function</i>	<i>Total 2015</i>	<i>Total 2016</i>	<i>Total 2017</i>	<i>Funding</i>
Kok, L.M.	drs.	oz	0,84	0,84	0,84	3
Lammers, M.	msc	oz	1,00	1,00	1,00	3
Scholte, R.S.	drs.	oz	1,00	1,00	1,00	3
Tempelman, D.C.G.	drs.	oz	1,00	1,00	0,95	3
Regulatory Economics & Sustainability						
Benthem, M. van	dr.	oz	-	0,50	1,00	3
Buunk, E.	msc	oz	-	1,00	0,58	3
Hof, B.J.F.	drs.	oz	0,95	0,95	0,95	3
Kocsis, V.	dr.	oz	0,74	0,49	-	3
Noll, R. van der	dr.	oz	0,95	-	-	3
Rosenboom, N.	msc	oz	1,00	1,00	-	3
Tieben, L.A.W.	drs.	oz	1,00	1,00	1,00	3
Veld, D.L. in 't	dr.	oz	-	-	1,00	3
SEO Aviation Economics						
Boonekamp, T.	msc	oz	1,00	1,00	1,00	3
Burghouwt, G.	dr.	oz	1,00	1,00	0,75	3
Kempen, T.	drs.	oz	0,39	0,34	0,15	3
Lieshout, R.B.T.	drs.	oz	1,00	1,00	1,00	3
Spijker, V. van	msc	oz	0,17	1,00	1,00	3
Ubbels, B.J.	dr.	oz	0,79	-	-	3
Veldhuis, J.G.	drs.	oz	0,02	0,06	-	3
Zuidberg, J.	msc	oz	1,00	1,00	1,00	3
Competition, Market & State						
Behrens, C.	msc	oz	-	-	0,92	3
Buiren, K.B. van	drs.	oz	1,00	1,00	1,00	3
Fijnje, J.C.	msc	oz	-	0,81	1,00	3
Gerritsen, M.	drs.	oz	0,17	-	-	3
Leussink, L.	msc	oz	-	-	-	3
Rosenboom, N.	msc	oz	-	-	1,00	3
Smits, T.C.	msc	oz	1,00	1,00	1,00	3
Veld, D.L. in 't	dr.	oz	0,83	1,00	-	3
Voort, J. van der	msc	oz	1,00	0,50	-	3
Total 1st flow of funds			0,00	0,00	0,00	
Total 2nd flow of funds			0,00	0,00	0,00	
Total 3rd flow of funds			31,41	32,81	32,14	
Total 1st f.o.f. excl. PhD's			0,00	0,00	0,00	
Total all flows of funds			31,41	32,81	32,14	
PhD students			0,00	0,00	0,00	

13.2 PROGRAMME DESIGN

SEO Amsterdam Economics was established in 1949, by the Economic Faculty of the University of Amsterdam, to encourage applied research. SEO is one of the Netherlands' oldest economic research agencies. SEO Amsterdam Economics was transformed into a foundation independent from the University in the 1980s, although it preserves close links with the academic community and the University.

Our clients are many and varied: we work for ministries, private companies and institutions in the non-profit sector, both nationally and internationally. SEO Amsterdam Economics is independent. We are not linked to specific interests and operate in a non-partisan way. In general, SEO reports are made public to guarantee our independence and scientific quality.

SEO Amsterdam Economics is a medium-sized organisation. We have a scientific staff of about 40, the majority of whom are economists and econometricians.

Structure

SEO Amsterdam Economics consists of eight research units. A first unit is **Labour & Education** which specialises in in-depth labour market analysis, research into education and the evaluation of policy. Research topics include employability, the transition from school to work, temporary work, re-integration and exit from unemployment, wage differentials, employment benefits, migration, schooling and work and the evaluation of educational policies.

The unit **Financial Markets and Finance** helps clients with targeted financial-economic research and advice. Finance is a field that has traditionally been used mainly in the corporate sector, but nowadays is being used increasingly in the public sector as well. The unit's research and advice focuses on three areas: (1) financial regulation (2) financing of public activities, and (3) the interaction between the public and private sector.

The unit **Health Care & Social Security** analyses developments in healthcare and social security, with research often shaped by the highly regulated nature of these two sectors. This unit specialises among others in market analyses, assessments of the effectiveness of policy, cost-benefit studies and the development of budgeting and costing systems.

Research in the unit **Regulatory Economics & Sustainability** concentrates on the design, analysis and evaluation of competition and government intervention aimed at sustainability. The research deals with issues related to the structure, conduct and performance of markets and sectors, regulation and deregulation, economic aspects of cartels, mergers, market dominance and other topics in the field of sustainable development.

SEO Aviation Economics advises governments, airlines, airports, financial institutions and other interested parties on economic issues related to aviation. The unit's activities include operations research, econometric analyses and forecasting, feasibility studies and research into competition and market issues, as well as work in transport and regional economics.

The **Competition Economics** unit specialises in the economic analysis of state aid and public tenders. Economic organization and the boundaries between public and private economic activity are other issues that are dealt with in this section.

In 2017 two new units have been established. The unit of **Global Economics** performs research on macro-economic issues related to international trade and development and advises international institutions on their programmes. The unit of **Big Data Science** develops and applies new tools to help companies streamline their processes and solve problems by making use of advanced computer techniques.

Organisation

SEO Amsterdam Economics is governed by a six-member Supervisory Board. Day-to-day policy is carried out by the managing director and the deputy director. Moreover, SEO has a management team, which consists of the directors and the unit heads. SEO Amsterdam Economics also has an Advisory Board which meets yearly to review its research programme.

13.3 PROGRAMME EVALUATION

Academic publications by researchers are often a spin-off of research for clients. This year 15 articles have been published in refereed journals or books. The number of non-refereed academic publications was substantial.

In 2017 SEO researchers published 56 commissioned reports and 19 papers have been published in more popular outlets and newspapers.

13.4 RESOURCES AND FUNDING

SEO Amsterdam Economics does not receive any funding from the University or any other institution. All funds are raised by performing research for clients. SEO stimulates researchers to engage in science. Researchers at SEO Amsterdam Economics publish regularly in national and international professional journals.

SEO holds an NEN-EN ISO 9001:2008 quality certificate for Applied Economic Research and Consulting.

13.5 OUTPUT

Key publications

Bisschop, P., Kastoryano, S., & Klaauw, B. van der (2017). Street prostitution zones and crime. *American Economic Journal: Economic Policy*, 9(4), pp. 28-63.

Akcomak, I.S., Webbink, D. & Weel, B. ter (2016). “Why did the Netherlands develop so early? The legacy of the Brethren of the Common Life,” *Economic Journal*, vol. 126, no. 593, pp. 821-860.

Scholte, R., Van den Berg, G.J., Lindeboom, M. (2015). Long-run effects of gestation during the Dutch Hunger Winter famine on labor market and hospitalization outcomes. *Journal of Health Economics* 39, pp. 17–30.

Lammers, M. (2014). The effects of savings on reservation wages and search effort. *Labour Economics*, 27(2014), 83-98.

Aalbers, R., Shestalova, V. & Kocsis, V. (2013). Innovation policy for directing technical change in the power sector. *Energy Policy*, 63, 1240–1250.

Forthcoming

Noll, R. van der, & Baarsma, B. (forthcoming). Compliance with cartel laws and the determinants of deterrence – an empirical investigation. *European Competition Journal*.

Boonekamp, T., Zuidberg, J., Burghouwt, G. (2017). Exploring the determinants for airport profitability: Determinants of air travel demand: the role of low-cost carriers, ethnic links and aviation-dependent employment. *Transportation Research Part A: Policy and Practice*.

Rosenboom, N. S., Kocsis, V., & Mulder, J. D. (2017). Consumer damages for breach of antitrust rules: how to reach full compensation for consumers?, *Journal of Competition Law & Economics*.

Publications in numbers

Output type	Classification	#
Articles in journals	Refereed	14
	Non-refereed	1
	Professional	24
	Popular	10
Books or book chapters	Refereed	1
	Non-refereed	0
	Professional	0
	Popular	0
Reports	Professional	56
Conference proceedings		0
PhD theses		0
Total		106

Article in journal – refereed

- Annema, J.A., Frenken, K., Koopmans, C., & Kroesen, M. (2017). Relating cost-benefit analysis results with transport project decisions in the Netherlands. *Letters in Spatial and Resource Sciences*, 10(1), 109-127.
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- Gerritsen, S., Webbink, D. & ter Weel, B. (2017). “Sorting around the discontinuity threshold: The case of neighbourhood investment programme”, *De Economist*, vol. 165, no. 1, March 2017.
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- Hommes, C. & Veld, D. in ‘t (2017). Booms, busts and behavioural heterogeneity in stock prices. *Journal of Economic Dynamics and Control*, Volume 8, pp. 101-124
- Kok, L., Tempelman, C., Koning, P., Kroon, L. & Berden, C. (2017). “Do Incentives for Municipalities Reduce the Welfare Caseload? Evaluation of a Welfare Reform in the Netherlands”, *De Economist*, vol. 165, no. 1, March 2017
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- Zuidberg, J. (2017). Exploring the determinants for airport profitability: Traffic characteristics, low-cost carriers, seasonality and cost efficiency. *Transportation Research Part A*, 101, pp. 61-72.

Book / book chapter – refereed

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Article in journal - non-refereed

Polder, J.J., Gils, P.F. van, Kok, L., Talhout, R. & Feenstra, T. L. (2017). De rekening van roken, 161(D833), Nederlands Tijdschrift voor Geneeskunde.

Report – professional

Behrens, C., Buiren, K.H.S. van, Fijnje, J. & Smits, T. (2017). Marktwerking leermiddelen VO. SEO-rapport 2017-32. Amsterdam: SEO.

Bentham, M. van & Tieben, B. (2017) Zeewind versus kolenstroom. SEO-rapport 2017-42. Amsterdam: SEO.

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Article in journal – professional

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- Buiren, K.H.S. van & Behrens, C. (2017, 1 December). Een openbaredienstverplichting voor Caribisch luchttransport, in: Economische Statistische Berichten, online gepubliceerd.
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Talk or presentation

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- Appelman, R. & Oomes, N. (2017, 16 February). Rol van de tussenhandel in waardeketen cacao, Wageningen Universiteit.
- Behrens, C. (2017, 7 July). From Silver to Platinum: The Impact of Frequent-Flier Tier Levels on Demand, ARTS-congres, Antwerpen.
- Boonekamp, T. (2017 7 July). Market stimulation of new airline routes, ATRS-congres, Antwerpen.
- Boonekamp, T. & Zuidberg, J. (2017, 22 June). Current and future trends in the aviation sector, delegatie uit Dongseo (Zuid-Korea), SEO, Amsterdam.
- Boonekamp, T. (2017, 8 May). The Impact of Airport Capacity Constraints on Air Fares, ACI Economics Committee Meeting.
- Buiren, K.H.S. (2017, 24 October). Transnational Education in Curacao, Ministry of Economic Development Curacao.

- Buiren, K.H.S. (2017, 9 October). Cartel damage assessments, AKD Advocaten Brussel.
- Buiren, K.H.S. (2017, 19 July). Economics of Public Procurement, Guest Lecture Honours Program University of Amsterdam.
- Buiren, K.H.S. (2017, 30 May). Aanbesteden en de kwaliteit van het OV, Provincie Zuid-Holland.
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- Lieshout, R. (2017, September). Impact of Brexit on the aviation industry, NBCC Brexit Forum.
- Lieshout, R. (2017, 16 May). Market stimulation and catchment area data, AT3 Annual Meeting, Zurich.
- Lieshout, R. & Boonekamp, T. (2017, 9 March). The impact of airport capacity constraints on air fares, Europese Commissie DG Move, Brussels.
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