

New Entrants to the Polish Academe: Empirical Findings in the Light of Major Theories of Research Productivity

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Society: the Project Conceptual and Methodological Definition, a
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Introduction

- **The academic profession** = the core of national HE systems. Not buildings or infrastructure – but highly motivated professionals; non-replacable; non-outsourcable abroad; with (still) high social prestige.
- How **theories** of research productivity **fit** Polish academy – an academic profession in transition, with **pre-1989** and post-1989 academics working alongside
- Research design: to confront (young = under 40) **Polish** academics with **Western European** (young) academics:
 - in a **large-scale context of empirical data**: over 17,000 returned surveys, over 500 semi-structured interviews, 11 European countries (Poland: 3,704 **surveys** in 2010 and 60 in-depth semi-structured **interviews** in 2011, respectively. Interviews: Dr. Dominik Antonowicz, University of Torun).
 - No other postcommunist country to compare to until 2014 (Slovenia, Russia).

Introduction – Poland, the Country Context

- the gross enrollment rate: „**elite**” HE, 10% (1989), “**mass**” (15.5% in 1992), and in 2007 “**universal**” HE (51.1%) (Trow 2010: 86-142). 51-53% in recent years, slightly declining.
- 2014: 1.49 million students, 124 public and about 300 private HEIs.
- student numbers - **declining** consistently, from 1.94 million in 2006.
- academic profession – about 100,000; 90% full-time; 7 major academic cities; only Warsaw and Cracow in ARWU ranking; 20th in global research production (SCImago Country Rank 2015)
- two major **drivers of change** in 2015:
 - heavy pressures of declining demographics and
 - the recent structural reforms (2009-2011) which introduced new funding and governance mechanisms.
 - academics heavily affected by the introduction of new quasi-market, highly competitive research funding (at the expense of traditional, less competitive research subsidies);
 - new academic career requirements, focused on the internationalization in research and peer-reviewed international publications
 - revised national-level research assessment exercises, closely linked to public funding (termed: parameterization and categorization of about 1,000 research units)
 - power to new national peer-run bodies, between the government and HEIs, leading to the increased complexity in governance and funding (PKA, KEJN, NCN and NCBR).

Theoretical Context – A Cohort Approach

- **Academic cohorts or generations:** Paula Stephan and Sharon Levin (*Striking the Mother Lode in Science. The Importance of Age, Place, and Time*, 1992).
- Many conditions in science are
 - “**not specific to the individual but, rather, specific to a generation.** This means that success in science depends, in part, on things outside the control of the individual scientist” (1992: 4).
- In a Polish context,
 - “the 60-years-old is not only 25 years older than the 35-years-old but was also **born in a different era** when values and opportunities may have been significantly different” (Stephan and Levin 1992: 58).
- Poland under communism **until 1989 - and today!** Worlds apart.
- Polish academics under 40 - a textbook example of academics born to academic life in a different **era** and working according to different **values** and, especially, **opportunities** (interviews). From closed to global science.
- Our research followed a more general observation that
 - “members of **different cohorts** may exhibit differences in **behavior, values, and intellectual abilities**” (Stephan and Levin 1992: 115) (interviews and a survey)

Theoretical Context – Research Productivity (1)

- Theories of research productivity
 - Scholarly topic for a long time (Crane 1963; de Solla Price 1963; Merton 1968; and Cole and Cole 1973).
 - The literature: **individual** and **institutional factors** that influence research productivity. E.g.:
 - the size of the department; disciplinary norms; reward and prestige systems, individual-level psychological constructs: a desire for the intrinsic rewards of puzzle solving (see Leisyte and Dee 2012; Stephan and Levine 1992; Ramsden 1994; and Teodorescu 2000),
 - faculty orientation towards research; the time spent on research; being a male academic; faculty collaboration; faculty academic training; years passed since PhD.
 - Institutional cooperative climate and support at the institutional level (Porter and Umbach 2001; Katz and Martin 1997; Smeby and Try 2005; and Lee and Bozeman 2005). And many more!

The extreme differences in individual research productivity can be explained by a number of **theories**: three briefly:

- the “**sacred spark**” theory,
- the “**cumulative advantage**” theory (combined with the “**reinforcement** theory”)
- the „**utility maximizing theory**”.

Theoretical Context – Research Productivity (2)

(1) The “**sacred spark**” theory:

- “there are **substantial, predetermined differences** among scientists in their ability and motivation to do creative scientific research” (Allison and Stewart 1974: 596).
- Highly productive scholars are “motivated by an **inner drive** to do science and by a sheer **love of the work**” (Cole and Cole 1973: 62).
- Productive scientists are a strongly motivated group of researchers and they have the **stamina, “or the capacity to work hard** and persists in the pursuit of long-range goals” (Fox 1983: 287).
- Paula Stephan and Sharon Levine (1992: 13), “there is a general consensus that certain people are **particularly good at doing science** and that some are not just good but **superb**”.

(2) The “**accumulative advantage**” theory:

- **productive scientists are likely to be even more productive** in the future, while the productivity of those with low performance will be even lower (Robert K. Merton, 1968).
- The accumulative advantage theory is related to the **reinforcement theory** formulated by the Coles (1973: 114) which in its simplest formulation: “scientists who are **rewarded are productive**, and scientists who are **not rewarded become less productive**”.
- Jerry Gaston (1978: 144): reinforcement deals with **why** scientists continue in research activities; and accumulative advantage deals with **how** some scientists are able to obtain resources for research that in turn leads to successful research and publication.
- Several studies (Allison and Stewart 1974; Allison, Long and Krauze 1982) support the cumulative advantage hypothesis, without discrediting the sacred spark hypothesis.

Theoretical Context – Research Productivity (3)

(3) The “utility maximizing theory”:

- all researchers choose to **reduce their research efforts over time** because they think other tasks may be more advantageous. As Svein Kyvik (1990: 40) comments, “eminent researchers may have few incentives to write a new article or book, as that **will not really improve the high professional reputation that they already have**”.
- Stephan and Levine (1992: 35) in discussing age and productivity: “later in their careers, scientists are less financially motivated to do research. ... with **each additional year the rewards for doing research decline**”.

These three major theories of research productivity are **complementary** rather than **competing**: to varying degrees, they are **all applicable** to the academic profession.

Research productivity, definition, Daniel Teodorescu (2000: 206): the “**self-reported** number of journal articles and chapters in academic books that the respondent had published in the **three years** prior to the survey” (=CAP/EUROAC design).

How do they **apply to Poland**, from the cohorts’ perspective?

Intergenerational Patterns

- European academic cohorts: **young** academics in their „formative years” (mostly < 10 years with a PhD., Teichler 2008) and **older** academic cohorts.
- **Three** dimensions studied:
 - Weekly research **time allocation**,
 - Research/teaching **role orientation** (preference),
 - Research **productivity**.

Research questions:

Are young academic cohorts in Poland (post-1989) different from older generations?

How do they fare **compared** with their **Western** European colleagues?

What inhibits their productivity?

Data used: only full-time academics, employed in universities (not: other HEIs), involved in research.

No need – in this place today – to discuss the samples, their characteristics, survey design, audit reports, and limitations!

Research Findings (1)

- The **difference** in the time allocation between teaching and research **across different age groups** of academics: Poland vs. major European systems is **striking**.
 - Western European systems (Austria, Finland, Switzerland, Norway, Germany, and Italy): “young academics” 20-25 hours per week on research, Poland: only 14 hours.
 - Young academics in the Western European systems teach 6-9 hours per week, their Polish colleagues: up to three times more (19.5 hours).
 - Western Europe: research time sharply decreasing for older age groups (down to about 10 hours), teaching time is sharply increasing with age (up to about 16-18 hours).
 - In the German (Teichler 2014), Korean (Shin 2014) and American (Finkelstein et al. 1998) patterns, **young academics until a certain “critical point”** (tenure, Habilitation) **focus on research**.
 - In Poland: **virtually no differences** between the teaching and research time allocation (between young, mid-career and older academics).
 - In teaching periods, **research time is low and teaching time is high across all generations**. See Poland vs. Finland below (an example)

Research Findings (2)

Fig. 1: How long do faculty spend on various academic activities (when classes are in session) by **age group** (hours per week): **Poland** (left) vs. Finland (right). Full-time academics, universities, research-involved only

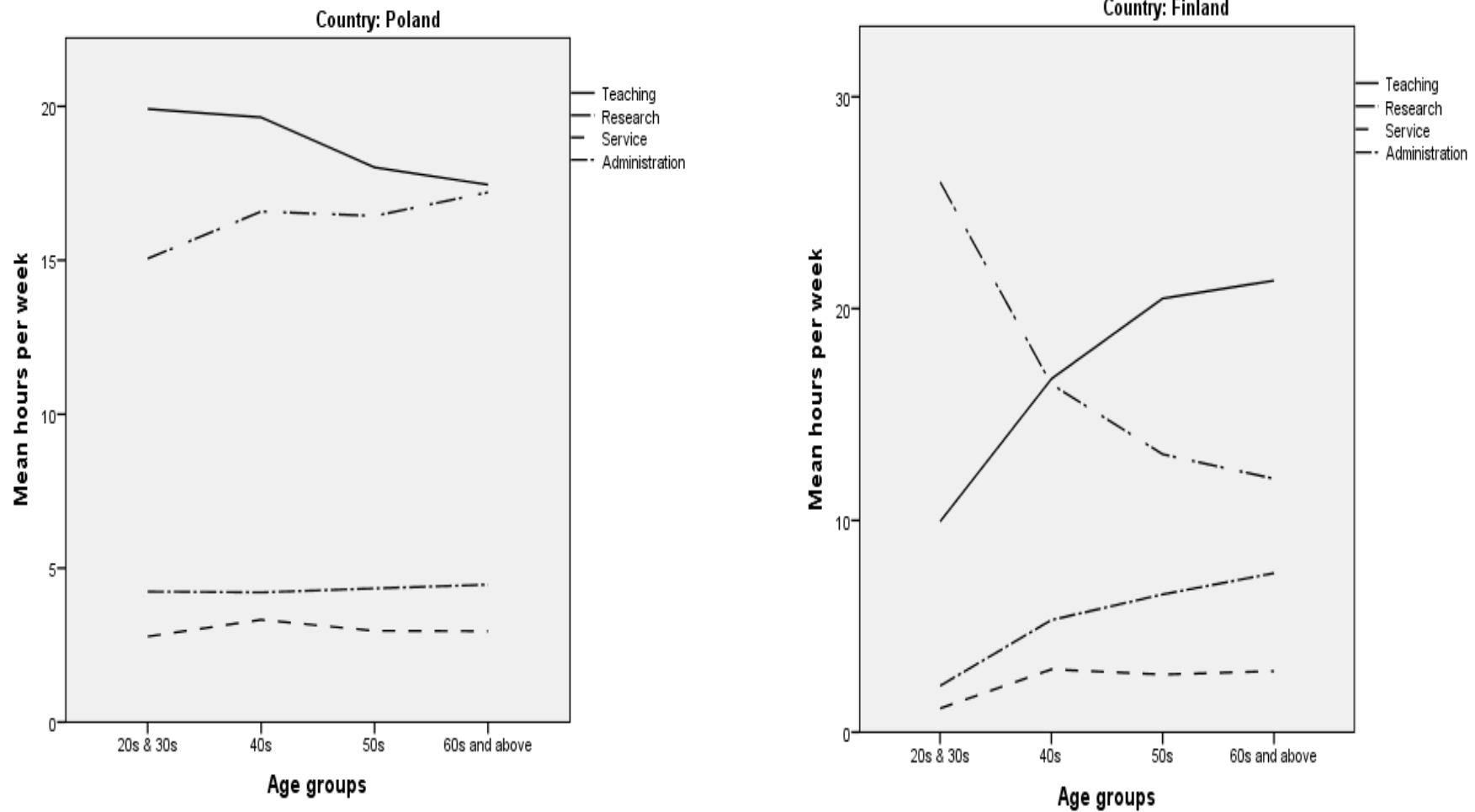


Table 1: Research-oriented faculty, by age group (Question: “Regarding your own preferences, do your interests lie primarily in teaching or in research?”, **answer 4 only**; “**Primarily in research**”) [percent]. Full-time academics, universities only, those involved in research only. Standard errors (SE) and coefficients of variance (CV) (percent).

Country	20s & 30s			40s			50s			60s and above		
	%	SE	CV	%	SE	CV	%	SE	CV	%	SE	CV
Austria	36.7	2.2	5.9	20.4	2.7	13.0	26.2	3.4	12.9	15.6	4.5	28.9
Finland	46.2	2.6	5.6	31.5	3.3	10.5	16.8	2.9	17.5	14.4	3.5	24.4
Germany	41.7	2.8	6.7	22.7	3.2	13.9	17.9	3.7	20.6	6.5	2.9	44.4
Ireland	11.6	1.9	16.4	10.4	2.2	20.7	7.1	2.3	32.1	8.1	4.5	55.4
Italy	19.7	2.8	14.4	14.4	1.5	10.7	10.4	1.5	14.3	6.2	1.1	17.4
Netherlands	36.2	4.3	12.0	27.9	6.1	21.9	19.1	5.3	27.5	13.9	5.9	42.7
Norway	45.1	2.9	6.4	36.8	3.8	10.5	19.3	3.0	15.5	16.7	2.9	17.7
Poland	18.1	1.6	8.8	12.9	1.6	12.7	6.3	1.3	20.2	6.5	1.5	23.2
Portugal	7.3	2.3	31.4	5.6	2.6	46.5	11.3	4.5	39.6	1.4	2.7	192.5
Switzerland	33.8	3.2	9.4	25.9	5.0	19.4	16.8	5.1	30.6	-	-	-
United Kingdom	52.7	4.1	7.7	40.5	5.7	14.1	23.5	6.3	26.9	3.3	3.3	100.5

Research Findings (3)

- Historically, the average research orientation of the Polish academic profession in the university sector in 2010 (12.2 percent)
 - **returned to the low levels of the 1980s** (12.9 percent in 1984), after a peak of 16.7 percent in 1993 (Wnuk-Lipińska 1996: 99).
- And in a wider approach (answers 3 and 4, “both, but leaning towards research” combined with “primarily in research”), the average research orientation
 - has **actually gone down in the last three decades** by more than 10 percentage points (from 73.6 percent in 1984 to 71.5 percent in 1993 to 62.5 percent in 2010).
- One of the most **distressing** results of our research:
 - the Polish university sector is **much less research-oriented** and changing in a **opposite direction** to the major Western European systems (Teichler et al. 2013; Shin et al. 2014).
 - While the young generation in Poland is indeed more research-oriented than older generations, this is not reflected in higher research engagement (because teaching expectations are rigid and juniors are teaching overtime more often than seniors).

Table 2: Average academic productivity, all items, all European countries (Q D4: “How many of the following scholarly contributions have you completed in the past **three** years?”). Academics **under 40 only**, involved in research, employed full-time in the university sector.

(Arimoto 2011: 10 p. book, 5 p. edited book, 1 p. paper or book chapter, 0.5 conference)

Countries/Items	Scholarly books you authored or co-authored	Scholarly books you edited or co-edited	Articles published in an academic book or journal	Research report monograph written for a funded project	Paper presented at a scholarly conference	A composite country index of research productivity
Austria	0.5	0.4	2.5	1.9	7.8	18.8
Finland	0.3	0.2	3.2	1.1	4.0	12.6
Germany	0.2	0.1	4.0	1.3	4.7	12.7
Ireland	0.3	0.2	5.9	1.6	8.1	18.6
Italy	0.7	0.3	8.2	1.3	8.3	25.2
Netherlands	0.4	0.2	7.6	1.7	5.9	20.1
Norway	0.2	0.1	3.1	0.4	3.3	8.3
Poland	0.1	0.1	3.7	0.2	3.2	7.6
Portugal	0.4	0.3	4.4	1.2	8.3	17.7
Switzerland	0.3	0.2	4.3	1.0	4.4	13.9
United Kingdom	0.1	0.1	4.7	1.1	5.4	12.1
Item mean	0.3	0.2	4.2	1.1	5.4	

Figure 2. A composite research productivity index (Q D4: “How many of the following scholarly contributions have you completed in the past **three** years?”). Academics **under 40 only**, involved in research, employed full-time in the university sector.

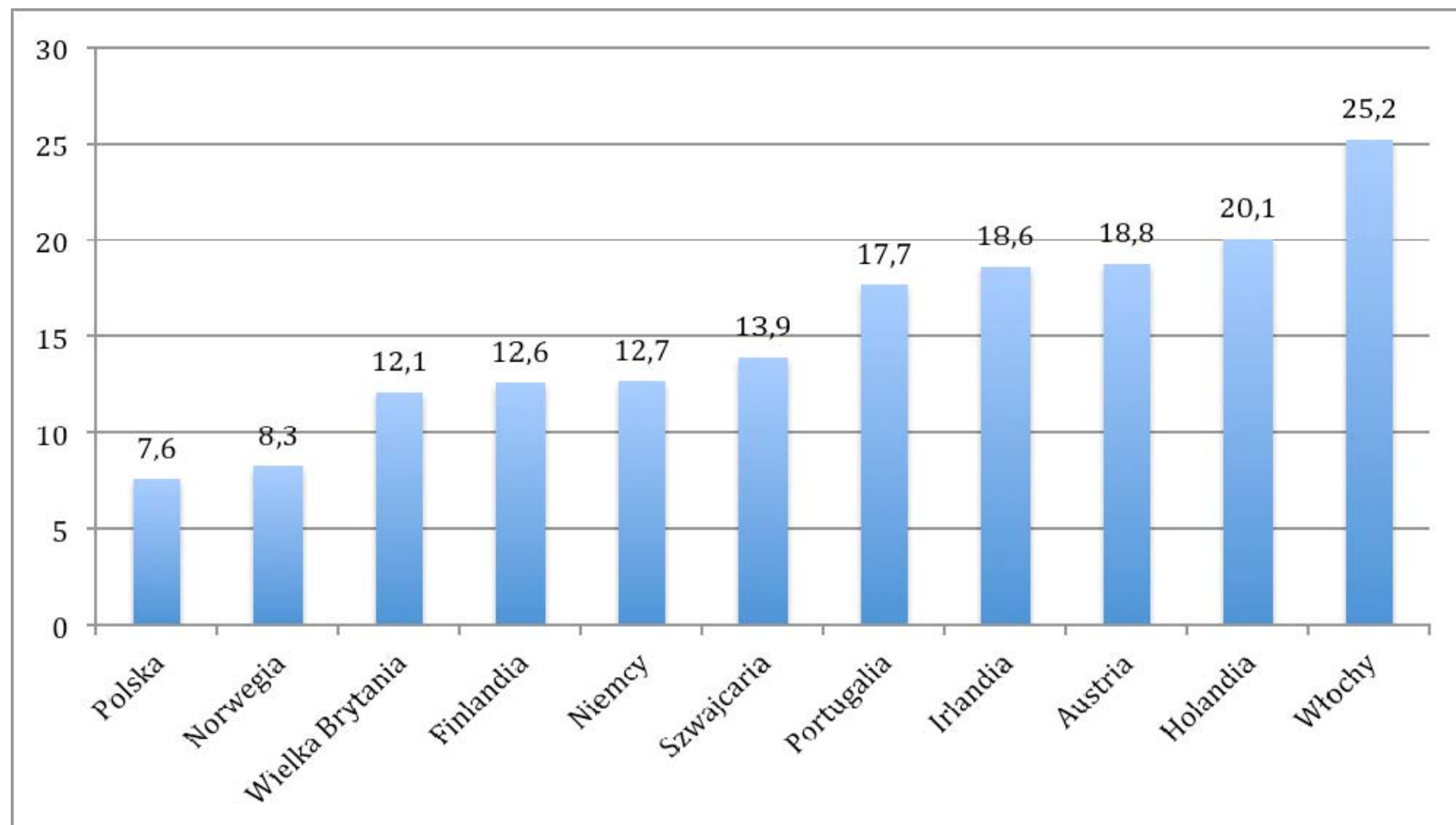


Table 3: The index of average research productivity, by age group: academics under 40, in their 40s, 50s, and 60s. Academics involved in research only, employed full-time in the university sector.

	Academics under 40	Academics in their 40s	Academics in their 50s	Academics in their 60s and older
Austria	18.8	34.1	29.3	31.3
Finland	12.6	19.7	21.7	26.8
Germany	12.7	28.2	31.0	38.3
Ireland	18.6	22.7	24.3	24.2
Italy	25.2	29.4	33.4	30.0
Netherlands	20.1	32.3	32.5	32.6
Norway	8.3	12.1	19.8	25.5
Poland	7.6	9.1	10.1	9.4
Portugal	17.7	23.5	39.0	34.7
Switzerland	13.9	36.0	42.1	37.6
United Kingdom	12.1	18.0	20.1	21.4

Research Findings (4)

- What makes the publishing patterns of young Polish academics different (and similar to their older Polish colleagues)?
 - early in their careers, they publish only slightly less than the average for 11 countries (3.7 vs. 4.2 papers).
 - But young Polish academics are far behind those countries in which young academics are the most productive and attend many more conferences.
- During their “formative years” (Teichler 2006), Polish academics do not have either the **willingness** or **opportunities** to participate in knowledge production and distribution through the various, at this stage mostly national, channels.
- The contrast with Western European academics: **starker** in the case of **older** academic generations.
 - Against clear European patterns in which research productivity grows with age, older Polish academics (and especially those in their 50s) **do not publish substantially more or attend substantially more scholarly conferences.**
 - Older Polish academics **lag behind in all items more and more in older age groups.**
 - In contrast, the average for almost all countries **rises** with every age group increase.
 - While older generations across Europe publish more and more (and the oldest generation is the most productive one in all countries except for three), older generations in Poland remain **very low research producers.** See a composite index below:

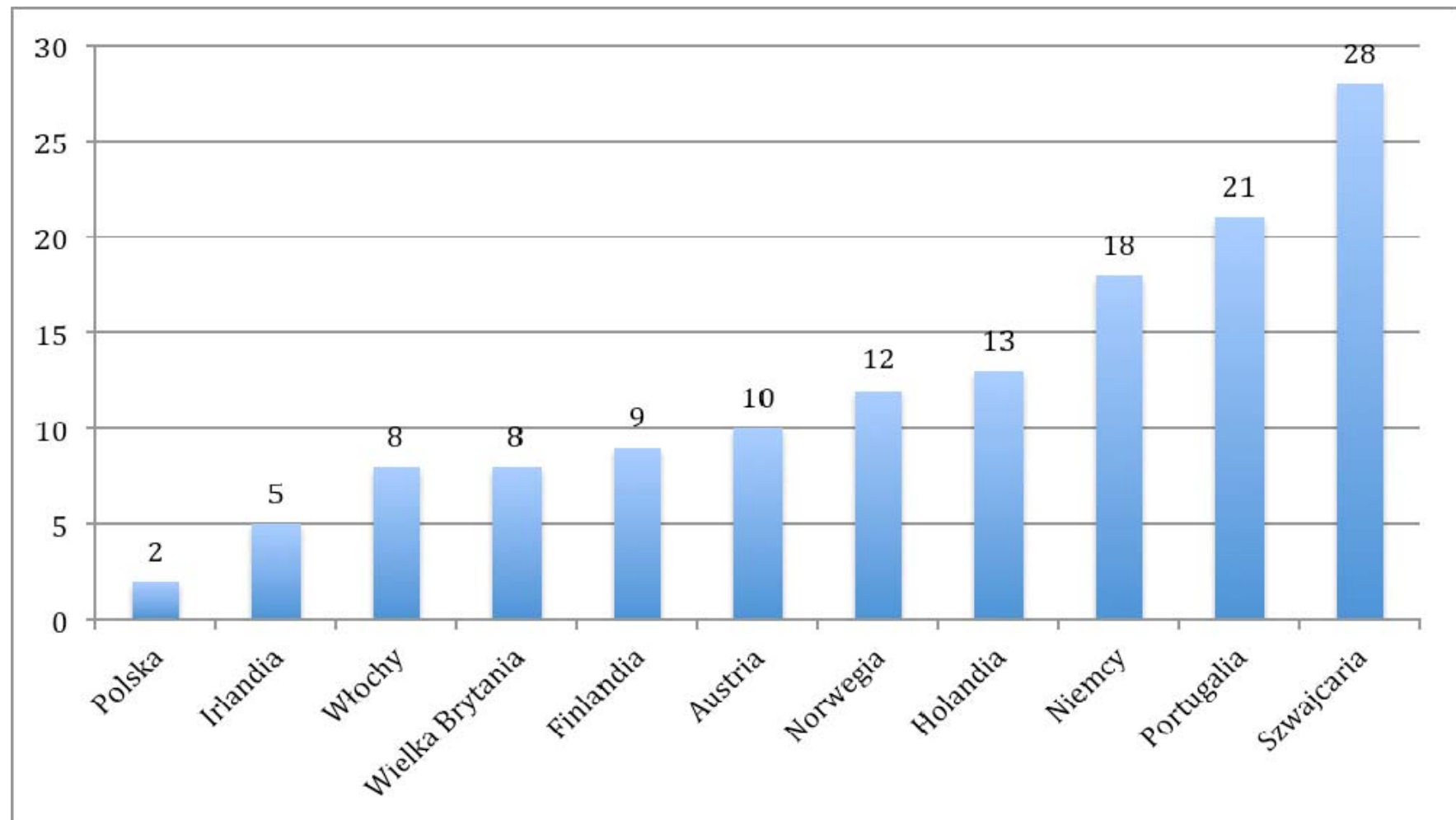
Table 4: The index of average research productivity, by age group: academics under 40, in their 40s, 50s, and 60s. Academics involved in research only, employed full-time in the university sector.

	Academics under 40	Academics in their 40s	Academics in their 50s	Academics in their 60s and older
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Ireland	18.6	22.7	24.3	24.2
Italy	25.2	29.4	33.4	30.0
Netherlands	20.1	32.3	32.5	32.6
Norway	8.3	12.1	19.8	25.5
Poland	7.6	9.1	10.1	9.4
Portugal	17.7	23.5	39.0	34.7
Switzerland	13.9	36.0	42.1	37.6
United Kingdom	12.1	18.0	20.1	21.4

Research Findings (5)

- The most interesting **productivity differential** is between academics **under 40** (those socialized to academia after the collapse of communism) and those **in their 50s** – who entered academia under communism (there were very few late comers).
- The average jump in productivity for these two generations is radical:
 - Poland fundamentally differs from Western European countries.
 - The **jump in the index is by 2 points**, while in other countries it could be as high as 20 points or more (as in Germany, Switzerland, and Portugal), and in most countries - in the range of 5-10.
 - Polish academics indeed can – following the “utility maximizing theory” – be increasingly interested in duties other than research (such as teaching or leadership).
 - But the **cross-generational productivity patterns** in Poland are **worlds apart** from Western European patterns shown above.

Figure 3: Change in the index of average research productivity, by age group: Under 40 and in their 50s, numerical difference. Academics involved in research only, employed full-time in the university sector.



Conclusions (1)

- Polish academics under 40 exhibit **different academic behaviors** and **academic attitudes** than their older colleagues:
 - they **work differently and they think differently** about the nature of their work.
 - much less research-oriented and spend fewer hours on research than in Western Europe.
 - Such a **sharp Western European intergenerational divide** in academic time investments and research orientation is **not observable** in Poland.
- While in Western Europe, research productivity **increases hugely with age**, in Poland there is **only very limited increase** of productivity between younger and older generations.
 - **All** Polish academics spend **much more time on teaching and much less time on research**.
 - Their **average productivity is low** from a European comparative perspective (even though Polish research top performers are not different).
 - High teaching hours for young academics in Poland **may effectively cut them off from research achievements** comparable to those of young academics in major Western European systems.
 - Their high teaching involvement **effectively reduces the number of hours left** for research.

Conclusions (2)

- Although there seem to be no intergenerational conflicts regarding the role orientation
 - this comes at the cost of a relatively low research performance by young academics and a low national research performance.
 - The qualitative material from the interviews suggests a sea change in academic attitudes which could not be gained through the survey instrument used:
 - an increasing interest in the **internationalization** of research,
 - the mounting **competition** for research funds, global (rather than national) science as a reference point in research,
 - the widely shared **belief in objective criteria; meritocracy** ousting the reality of subjective judgments; partner-like relationships based on scientific authority – not feudal-like relationships between the two academic castes.

Conclusions (3)

- In the Polish case, of the three theories of research productivity,
 - the „**sacred spark**” theory – **works** (research top performers – 50% of all knowledge production)
 - the „**accumulative advantage theory**” – **does not work**, a transition system, no significant increase in productivity with age, past achievements – not relevant (resources, prestige, knowledge distribution channels) today
 - „**the utility maximizing theory**” – **works** (older generations’ productivity almost the same as the youngest’s).
 - **Some hypotheses work in some systems at some periods of time;** others – in different times.
 - The „accumulative advantage theory” is operating only for academics under 40 – in their competitive race for resources and prestige, with new „quasi-market” realities in Europe and Poland (a new research council).
 - *Thank you very much! Comments to: kwiekm@amu.edu.pl*

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