Quantitative research assessment and its unintended consequences

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October 2025

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Leiden
The Netherlands

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Cover image generated by Google Gemini.

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Proefschrift

ter verkrijging van

de graad van doctor aan de Universiteit Leiden,

op gezag van rector magnificus prof.dr.ir. H. Bijl,

volgens besluit van het college voor promoties

te verdedigen op donderdag 30 oktober 2025

klokke 16:00 uur

door

Eleonora Dagienė

geboren te Kaunas, Litouwen

in 1963

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“Be not righteous over much; neither make thyself over wise:
why shouldest thou destroy thyself?”

Ecclesiastes 7:16

Acknowledgements

The completion of this dissertation marks the culmination of a challenging yet rewarding academic journey, one that would not have been possible without the unwavering support, expert guidance, and generous contributions of those I encountered along the way. My deepest gratitude goes out to each person who has played a role, large or small, in bringing this work to fruition.

First and foremost, I wish to thank my primary supervisor, Professor Ludo Waltman. I value the academic freedom he encouraged in allowing me to choose and pursue research topics that resonated most deeply with me. His patience in editing my writings, unwavering attention to detail, and open-minded willingness to discuss ideas were instrumental in shaping me into the confident researcher I am today. I am equally thankful to my second supervisor, Professor Vincent Lariviere, for agreeing to supervise me from the outset, and for his gracious support amid new developments in my research agenda. When I decided to add a qualitative component to my research, Ludo introduced me to Guus Dix, who became my third supervisor. Thus, I extend my sincere thanks to Guus, with whom I spent months meticulously analysing interviews conducted with Lithuanian academics. This significant part of my research simply would not be possible without his involvement and expertise.

I am also deeply appreciative of the stimulating and welcoming atmosphere at the Centre for Science and Technology Studies (CWTS) at Leiden University, where I conducted my research. Firstly, thank you to my fellow PhD candidates – Wout, Zhichao, Juan, Soohong, Qianqian, Philip, Dmitrii, Andrea, Renate, and Ana – sharing this journey and your camaraderie meant a great deal. My sincere thanks also go to all the CWTS researchers. You welcomed me so warmly, especially during the challenging times of the pandemic. Your support, both for my research and in keeping spirits high (even through the online CWTS bar during lockdown!), was invaluable and genuinely brightened a difficult period.

Furthermore, I want to extend my gratitude to the Lithuanian academics who gave freely of their time in face-to-face interviews. Their participation provided crucial insights, and I greatly appreciate their openness and thoughtful reflections. In addition to these participants, I thank fellow academics who showed curiosity about my research and kept in touch. Thank you to Saulius Maskeliūnas for your generous assistance in finding policies and documents missing from the official portals; to Rita Vaičekauskaitė for faithful support in navigating the often-troubled waters of academic research; and to Karolina Bagdonė for your encouragement to write pieces for a lay audience and your help in communicating my research more broadly. Thank you to Artiom Magomedov for consistently asking how my research was progressing, a small check-in that always

meant a lot; to Jelena Stankevičienė for our long-distance walks and the meaningful conversations we shared, providing much-needed perspective; and, finally, to Irma Čižauskaitė, for the joy she brought to sharing every research milestone, for her patient listening, and for the treasured gift of her enduring faith in me.

A crucial part of my academic journey was the welcoming and supportive community at Mykolas Romeris University that I joined in the middle of my PhD studies. My thanks go first to the Rector, Professor Inga Žalėnienė, who opened the university door to me, and to the Dean, Professor Odeta Merfeldaitė, who warmly welcomed me to the faculty. From the moment I arrived, I have felt an immediate sense of belonging, as if I had been here for years. I am truly grateful for being provided with a safe and nurturing environment for my research and teaching work.

On a profoundly personal note, this journey would not have been possible without the wholehearted support of my family, who encouraged my unconventional idea to pursue a PhD later in life at 55. My deepest gratitude goes to my parents and parents-in-law for their unconditional love and support. Thank you to my elder son Jevgenij and his wife Kristina, and to my elder daughter Olga and her husband Karolis, for supporting my PhD endeavour and showing genuine interest in my research. A heartfelt thank you to my dear younger kids, Joris and Adelė, for helping themselves and allowing Mum the uninterrupted time needed for research. My deepest gratitude is reserved for my beloved and loving husband, friend, and strongest supporter, Algirdas. Without his unwavering belief and constant encouragement, my dream of becoming a researcher simply would not have come true.

My PhD journey was not without its challenges, but the generous help I received along the way made all the difference. My sincere thanks also extend to many others whose support, encouragement, or brief interactions were invaluable along the way. Thank you all from the bottom of my heart.

Eleonora Dagienė, 2025

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Chapter 1.
General introduction

The experience of Lithuania, a small nation which regained its independence and has since begun navigating its integration into the global research landscape, resonates with countless other countries, large and small, that face similar challenges. This dissertation delves into the multi-faceted dynamics of quantitative research assessment, examining its historical evolution, policy implications, and impact on behaviour of individual researchers, institutions, and patterns of national outputs. By focusing on Lithuania, this thesis offers in-depth insights into the challenges and opportunities that national research systems face in a globalised world, shedding light on ongoing debates on responsible research assessment practices.

To provide the necessary background for this PhD research, this chapter is structured as follows. Section 1.1 begins by tracing the rise of quantitative research assessment practices, drawing on relevant literature. Section 1.2 reviews external evaluations of the Lithuanian science system and the narrative of "lagging behind." Section 1.3 then presents an overview of the quantitative research assessment system in Lithuania, focusing on its structure as developed over the past quarter-century. Finally, Section 1.4 explains the scope of this thesis and the research questions it aims to address.

1.1. The rise of quantitative research assessment

The introduction of the Frascati-based indicators (OECD 1963) marked a turning point in how research and development (R&D) was perceived in the early 1960s. This shift underscored the growing recognition of the role of R&D in driving economic growth and the need for standardisation, sparking interest in the economics of research, development, and innovation. Since the early 1970s, OECD countries have begun to adopt national science policies and funding systems (Lepori et al. 2007). The OECD, acting as a catalyst, developed a standard model for science policymaking and actively encouraged its adoption among member countries through various channels like transnational arenas, committees of national practitioners, and country reviews (Henriques and Larédo 2013). Somewhat later, the European Union embarked on the creation of the collaborative European Research Area, which similarly fostered the spread and uptake of research policies among member states (European Commission 2000).

The imperative for research internationalisation gained momentum after international organisations began to integrate national research communities into the global landscape (Wagner et al. 2001; Wagner and Leydesdorff 2005). The OECD issued methodological manuals for the measurement of scientific and technological activities, facilitating comparisons against a common international standard (OECD 1994). This drive was bolstered by bibliometric research, which highlighted the growing importance of international collaboration, particularly with the EU emerging as a key scientific partner for both advanced and developing countries (Glänzel, Schubert, and Czerwon 1999). Since then, more international collaboration has tended to mean higher publishing rates and better performance in terms of bibliometric indicators. Countries not collaborating internationally may be losing more than ever before in terms of resources and prestige (Kwiek 2015). With many countries

reporting their science and technology indicators, bibliometrics became the norm in science policymaking (Leydesdorff 2005; Okubo 1997).

The late 1990s marked a pivotal moment in research assessment, as countries such as the UK and Australia pioneered performance-based funding (PBF) systems (Anderson, Johnson, and Milligan 1996; Butler 2003b; Donovan and Butler 2007; Elton 1988; Franceschet and Costantini 2011; Jiménez-Contreras, De Moya Anegón, and López-Cózar 2003; OECD 2010). These systems, designed to tie research funding to performance outcomes, have evolved over time with varying objectives and implementation methods (Jongbloed et al. 2023). Some PBF systems operate *ex-ante* (before research), others *ex-post* (after), and evaluation methods range from *metrics-based* to *peer review* (Geuna and Martin 2003; Zacharewicz et al. 2019). While debate persists over the optimal approach (De Rijcke et al. 2016; Sivertsen 2017; Traag and Waltman 2019), many countries combine both, reflecting the complexity of research assessment (De Boer et al. 2015; Kulczycki, Korzeń, and Korytkowski 2017; Nelhans 2022). These PBF systems were designed to boost research productivity, enhance accountability and introduce market-driven approaches into academia (Hicks 2012b; Jonkers and Zacharewicz 2016). They rapidly spread globally and ushered in an era of quantitative research assessment.

At the turn of the millennium, the Web of Science (WoS) dominated as the principal source of the bibliometric data used to benchmark national research performance, track international collaboration, and evaluate institutions (Bozeman and Corley 2004; European Commission 2001; Glänzel 2001; Pohl 2021; Wagner et al. 2001). The launch of Scopus by Elsevier in 2004 introduced competition into the bibliometric landscape. As these citation indices gained prominence, the global science system transformed into a "citation economy," where academic success became increasingly tied to publication in indexed journals (Mills 2024). Alongside these citation indices, various journal ranking lists have also become deeply embedded in the academic environment, influencing decision-making at both institutional and individual levels (Allen and Heath 2013; Frey and Rost 2010; Rafols et al. 2012). However, the effectiveness of these ranking lists in truly advancing scientific progress remains a point of contention (Serenko and Bontis 2024).

The increased pressure to publish in peer-reviewed journals led to a transformation of the academic publishing landscape. The surging demand for papers prompted established publishers to launch new peer-reviewed journals and adapt their commercial strategies. This resulted in consolidation within the academic publishing industry, leading to an oligopoly of major publishers (Larivière et al. 2015). As the demand for publishing peer-reviewed outputs outstripped the available supply of reputable journals, publishers, institutions, and even researchers launched new journals. However, this rapid expansion fuelled concerns about the quality of newly launched journals and the papers they published, giving rise to the concept of "predatory publishing" (Beall 2017; Grudniewicz et al. 2019; Kendall 2021). Dissatisfaction with the publishing industry extended beyond newcomers to established players, leading to boycotts, such as the "Cost of Knowledge" campaign targeting Elsevier (Heyman, Moors, and Storms 2016).

While the broader policy context and nuanced interpretation of bibliometric data often remained under-discussed (Gläser 2024; Kehm and Teichler 2007; Robinson-Garcia and Ràfols 2020), researchers worldwide faced mounting pressure to publish in international, high-impact, English-language journals (Van Dalen and Henkens 2012). Though research internationalisation offered potential benefits such as increased collaboration and knowledge exchange, it also led to challenges for researchers and universities. The emphasis on Western-centric publication practices marginalised local perspectives and languages, incentivising researchers to conform to dominant academic paradigms (Hicks 1999, 2012a; Stöckelová 2012). Caught between these competing pressures, universities and researchers struggled to adapt their publication strategies (Hamann 2019; Hansen et al. 2019; Stoker 2006). Similarly, policymakers' ambitions to drive research internationalisation by incentivising publication in high-tier journals often clashed with the realities of local research environments, leading to significant obstacles and sometimes outright failure of such policies.

The widespread adoption of PBF has led to extensive research on its profound and often unintended consequences (Dahler-Larsen 2014; Franco-Santos and Otley 2018; de Zwart 2015). Studies have shown that PBF has impacted research systems at both national (Butler 2003b, 2003a; Elton 2000; Gläser et al. 2002; Taylor 2001) and institutional levels (Aagaard 2015; Dix et al. 2020; Hughes and Bennett 2013; Leišytė, Enders, and De Boer 2008; Mouritzen and Opstrup 2020). These systems have significantly affected individual researchers, often fostering a "publish or perish" culture (Miller, Taylor, and Bedeian 2011; Rowlands and Wright 2021) or a "publication game" (Butler and Spoelstra 2020).

Due to the proliferation of quantitative metrics and the unintended consequences they have posed, we are witnessing growing calls for responsible research assessment from academia and international organisations. First came academic calls such as the San Francisco Declaration on Research Assessment (DORA 2012), the Leiden Manifesto for research metrics (Hicks et al. 2015), the Vienna Principles on the Future of Scholarly Communication (Kraker et al. 2016), the Helsinki Initiative on Multilingualism in Scholarly Communication (Federation of Finnish Learned Societies et al. 2019), and the Hong Kong Principles for Assessing Researchers (Moher et al. 2020). In addition to these academic community initiatives, UNESCO adopted recommendations for open science (UNESCO 2021) and the European Commission launched and supported the Coalition for Advancing Research Assessment (CoARA) (CoARA 2022). The latter is particularly noteworthy as a policy-driven call for more inclusive and more qualitative approaches to research assessment, moving beyond now-traditional metrics such as journal impact factors.

Overall, research assessment reform has been in the air for years. Yet to effectively reform entrenched quantitative research assessment practices, it is crucial to understand how they were developed. The analysis of this development might contain lessons about the opportunities and difficulties in undoing or reforming quantitative assessment today. This requires an in-depth examination of the factors that influenced policy decisions, the key actors involved in policymaking processes, and their influence in policy implementation. Given the complex landscape of research assessment, country-level case studies can offer valuable

insights for current debates on research assessment reform, emphasising the importance of considering diverse interests, power dynamics, and potential unintended consequences in policymaking.

As internationalisation and PBF become increasingly prevalent, it is crucial to examine their impact on research systems across diverse contexts. Lithuania, with its ambitious pursuit of scientific internationalisation and its reliance on quantitative assessment, serves as a valuable case study for understanding the complex interplay between these trends. By analysing the Lithuanian experience, this thesis aims to contribute to broader debates on research assessment reform and the pursuit of responsible and effective research evaluation practices. This is particularly valuable for Lithuania and almost thirty other "low research and innovation (R&I) performing" countries striving to enhance their research performance within the European Research Area (Hardeman, Van Roy, and Vertesy 2013). Many of these countries remain relatively under-investigated in the global research literature on policymaking in the public science system and bibliometric analysis, whereas countries such as Poland and the Czech Republic have received significantly more attention (Good et al. 2015; Kulczycki 2018; Kulczycki et al. 2017; Stöckelová 2012). Ultimately, understanding the dynamics of quantitative research assessment in such contexts can offer valuable insights for policymakers and stakeholders seeking to develop effective and sustainable research policies amidst calls for reform.

The following sections critically review the existing literature on the Lithuanian science system to provide context for this PhD research and identify main areas for further investigation.

1.2. External evaluations and the narrative of "lagging behind"

This subsection provides an overview of international advisory reports commissioned by Lithuania, examining how external perspectives have shaped the development of its research and innovation landscape. These reports, prepared by organisations such as the EU, OECD, and World Bank, were developed in close collaboration between foreign experts and Lithuanian authorities. The recommendations provided in these reports proved instrumental for Lithuanian policymakers in transforming the science system and joining these prestigious international organisations. Spanning several decades, these assessments offer valuable insights into the perceived strengths and weaknesses of Lithuanian research and innovation, often highlighting a recurring theme: the narrative of "lagging behind."

1.2.1 Early assessments and the emergence of a narrative (1996–2006)

In the years after Lithuanian independence was restored, a series of international assessments played a crucial role in shaping the country's research and innovation landscape. In 1996, the Norwegian Research Council was invited to conduct the first assessment of the Lithuanian research system, particularly in international cooperation, doctoral training, and research collaboration (Research Council of Norway 1996). This expert evaluation aimed to provide

recommendations supporting the future development of Lithuanian research. As Lithuania sought to join international organisations, further assessments were conducted by the EU Commission (1999), OECD (2002), and The World Bank (2003). The experts consistently found that funding for research activities in higher education institutions was inadequate, resulting in unsatisfactory research and development outputs. The experts also noted a scarcity of Lithuanian publications in international databases such as the Web of Science, which were used to benchmark national research performance at that time. These early assessments were crucial. They highlighted key challenges, prompting further investigation into the state of Lithuanian research and laying the groundwork for the narrative of Lithuania needing to catch up. However, this was only the beginning of a longer process of evaluation and reform.

Building on these initial assessments, the European Commission launched a new initiative in 2007. This was the CREST Open Method of Coordination (OMC) Policy Mix exercise, designed to help EU member states improve their national innovation systems. It involved mutual learning and sharing of best practices, culminating in a comprehensive analysis of the Lithuanian innovation system (Edler et al. 2007). The resulting report was clear: Lithuania urgently needed reform. It called for swift action to address several challenges, including limitations in administrative capacity, policy intelligence, and coordination. Greater stakeholder engagement was also deemed crucial. The report offered a range of recommendations to overcome these obstacles. These included strengthening the "innovation model," linking incentives to research performance, and investing in capacity building and specialised funding agencies. It also stressed the importance of fostering dialogue with industry, consolidating institutional roles, and modernising governance within the public science system. Echoing earlier assessments, the report highlighted how Lithuania was falling short in its gross expenditure on research and development (R&D) compared to the EU average.

Despite efforts to improve, concerns about Lithuania's research and innovation performance persisted. International assessments continued to highlight underperformance. These evaluations consistently pointed to low research productivity and limited international collaboration as key areas requiring attention. For example, the EU Key Figures 2007 report (European Commission 2007) showed that Lithuanian researchers were less productive than the EU average. This was measured by considering scientific publications in Web of Science journals relative to public R&D expenditure. Furthermore, data indicated that Lithuania contributed only 0.09% to the world's share of scientific publications in 2004. This ranked it seventh from the bottom among EU member states.

The World Bank responded to these concerns with a 2009 review of Lithuania's science and technology (STI) policies (Thorn and Mogensen 2009). This was built upon the national and international assessments mentioned above and specifically the Norwegian Research Council (1996), the EU Commission (1999), the OECD (2002), and the World Bank (2003). It also referenced Lithuanian indicators presented in the EU Key Figures 2007 report. This review offered updated guidance for developing STI policies in Lithuania. It focused on four key areas: oversight and governance, the science base, R&D linkages, and industry innovative

capacity. Notably, the report emphasised the need for increased competition for research funding, reflecting a growing trend in Lithuania to measure research performance based on publications in international journals, particularly those indexed in Web of Science databases.

Building on these early assessments, the European Commission and other bodies continued to monitor Lithuania's progress. A key period of intensified scrutiny emerged with the introduction of two new mechanisms: the ERAWATCH Country Reports (2008–2013) and the later Research and Innovation Observatory (RIO) Country Reports (2014–2017). These reports, which involved collaboration with local experts, offered a more detailed and nuanced picture of the Lithuanian research and innovation system.

1.2.2. Intensified scrutiny: ERAWATCH reports (2007–2013)

The European Commission launched a series of in-depth evaluations known as ERAWATCH Country Reports produced for EU Member States and Countries Associated to the Seventh Framework Programme for Research of the European Union (FP7). The ERAWATCH Annual Country Reports aimed to characterise and assess the performance of national research systems and related policies in a structured manner that was comparable across countries. This section focuses specifically on the Lithuanian ERAWATCH reports and their relevance to this PhD research.

The 2008 report (Kriaucioniene 2009) stressed the need for structural reforms in higher education and research to boost R&D capacity and align with European standards. Despite acknowledging progress in increasing scientific publications, it stated that Lithuania "still remains among the EU outsiders." This theme of needing to "catch up" to EU counterparts echoed throughout subsequent ERAWATCH reports.

The 2011 report (Paliokaitė and Caturianas 2013) highlighted weaknesses in knowledge production and international collaboration. It noted that the low number of foreign PhD researchers in Lithuania indicated limited international competitiveness. Furthermore, it pointed to the absence of Lithuanian universities in the top 500 of the World University Rankings as evidence of this limited competitiveness.

The 2012 report (Paliokaitė 2014a) reiterated Lithuania's "lagging behind" in knowledge production, citing quantitative indicators. It revealed that while the number of publications had increased slightly, the proportion of highly cited publications remained less than half the EU average. Moreover, it highlighted the low rate of international co-publications, indicating a relatively isolated science base.

The 2013 report (Paliokaitė 2014b) further emphasised this lag. It presented a table of Main Innovation Union indicators whereby Lithuania scored low in most R&D performance categories, except for human resources, finance and support, and firm investment. Alarmingly, it concluded that based on innovation output indicators, "it is unlikely that Lithuania will bridge the innovation gap in the short or medium term."

Overall, the ERAWATCH reports painted a concerning picture: they showed Lithuania trailing its EU counterparts in key areas of research and innovation. This recurring narrative

underscored the need for continued and targeted efforts to strengthen Lithuanian position within the European Research Area. While the ERAWATCH reports highlighted broad performance issues, the subsequent RIO reports delved deeper into the challenges of implementing reforms.

1.2.3. Policy implementation and the RIO reports (2014–2017)

In addition to the ERAWATCH reports, the European Commission's Joint Research Centre (JRC) produced a series of Research and Innovation Observatory (RIO) Country Reports for the same EU member states. The RIO Country Reports were published annually and offered an analysis of the R&I system of the respective country, including relevant policies and funding, with a particular focus on topics critical for EU policies. The RIO reports also identified the main challenges of the respective national research and innovation system and assessed the national policy responses.

Building on the ERAWATCH reports, the RIO 2014 report for Lithuania (Paliokaitė 2015) highlighted the fragmented nature of the Lithuanian research and innovation system, calling for better policy coordination, increased private sector involvement, and greater commercialisation of public R&D. This report also noted that the establishment of the Research and Higher Education Monitoring and Analysis Centre (MOSTA) in 2007 was a direct response to earlier recommendations from international experts.

Subsequent RIO reports continued to emphasise the need for reforms. The RIO 2015 report (Paliokaitė, Krūminas, and Stamenov 2016) emphasised the challenge of building capacity for the private research and innovation sector, acknowledging skills mismatches, and further improving the commercialisation of public research. Interestingly, it also pointed out a potential unintended consequence of the national quantitative research assessment system, explaining disadvantages of counting funding points. While high-quality publications earned more points, the sheer number of low-quality publications outweighed the benefits of fewer high-quality ones, potentially incentivising quantity over quality of research. This report also mentioned the creation of lists of journals with high self-citation levels that were excluded from consideration for state funding allocation (this policy instrument is examined further in Chapter 3 as "the suspended journal lists").

Despite some progress noted in previous reports, the 2016 RIO report (Paliokaitė and Gonzalez Verdesoto 2017) identified four main challenges facing Lithuania: policy coordination, human resources, private investment, and commercialisation. While recognizing R&I policy developments and discussing the economic context, it highlighted concerning indicators, such as the low and decreasing rate of public-private co-publications (only 1.7 per million population in 2014, comparing to 33.9 EU average).

Despite these challenges, the report acknowledged Lithuania's proactive efforts to improve. It highlighted the shift of MOSTA, the Research and Higher Education Monitoring and Analysis Centre, toward accountability to the Government instead of the Ministry of Education and Science, signalling a greater emphasis on research and innovation at the highest levels of government. Furthermore, MOSTA's own report on the unattractiveness of working conditions

and career prospects for researchers (MOSTA 2016) indicated a commitment to improving the research environment.

The 2016 RIO report also highlighted the government's efforts to increase R&D funding for non-state higher education and research institutions through a quantitative performance-based system. Importantly, this report acknowledged significant policy developments in Lithuania. Within a year, the President of the Republic of Lithuania proposed the Science and Innovation Policy Guidelines, which were subsequently approved by Parliament. These guidelines were developed by consulting fifty stakeholders across academia, business, NGOs, and other sectors, demonstrating a commitment to both collaborative policymaking and a proactive approach to addressing the challenges identified in international assessments. The Parliament mandated that the Government prepare an implementation plan for these guidelines by the end of 2016, further underscoring this commitment and aiming to translate policy recommendations into concrete actions.

Continuing this trend of critical evaluation, the RIO 2017 report (Paliokaitė, Petraitė, and Gonzalez Verdesoto 2018) began its summary with a statement highlighting how Lithuania was falling short in developing innovative and entrepreneurial talent. Overall, however, it focused on skills shortages, R&D commercialisation, policy coordination, and the growth of innovative companies, including a discussion of the Smart Specialization Strategy.

The RIO reports were instrumental in informing authorities and promoting evidence-based approaches to research and innovation. By consistently emphasising the need for continued reforms and strategic interventions to address persistent challenges—such as research fragmentation, lack of private sector investment, and difficulties in commercialising research results—they underscored the gap between Lithuanian R&I performance and EU averages. This recurring narrative served as a constant reminder of the ongoing efforts needed to enhance Lithuania's position in the global research landscape.

1.2.4. Broader European assessments and the "low R&I performing" label

Beyond these in-depth analyses, broader assessments of European innovation performance also highlighted areas where Lithuania needed to improve. In addition to the ERAWATCH and RIO reports, the 2017 European Innovation Scoreboard provided a composite indicator of research and innovation performance across the EU, placing Lithuania at the bottom of the European rankings (Vertesy 2017). In fact, the Scoreboard identified fifteen 'less advanced' EU member countries, including Lithuania, a group that has since expanded to almost thirty 'widening countries' including EU-associated nations and the Outermost Regions. These countries are now targeted to receive additional EU grants to bolster their research and innovation capacities (European Commission 2024).

Similarly, OECD reviews in 2016 and 2017 stated that "the performance of the Lithuanian higher education system with respect to research and innovation is significantly below international standards" (OECD 2016, 2017). Interestingly, these reviews, based on stakeholder interviews and a background report commissioned by the Lithuanian authorities,

specifically noted the absence of Lithuanian universities in the CWTS Leiden Ranking 2015 of university scientific performance and limited appearance in other university rankings.

Notably, Lithuanian experts from the association "Knowledge Economy Forum" prepared a background report for these OECD assessments, entitled "Initial Assessment of Lithuanian Innovation Policy." Thus, the OECD reports were a collaborative process, involving both Lithuanian policymakers and international experts, highlighting the commitment to improving Lithuania's standing in the global research landscape. However, the persistent identification of areas needing improvement underscored the ongoing challenges in achieving this goal.

1.2.5. The legacy of external evaluations

These international advisory reports, while valuable in guiding Lithuanian authorities in developing research and innovation policies, consistently revealed a narrative of Lithuania underperforming compared to its EU counterparts.

The recurring identification of challenges—such as insufficient funding, low research productivity, and limited international collaboration—helped Lithuanian policymakers lobby for changes in the public science system. These international reports, spanning several decades with their recurring narrative of underperformance, have undeniably shaped Lithuania's research and innovation policy landscape, spurring policy changes across various domains. To understand how these recommendations have been implemented nationally, the next section explores state-level reports that have guided the development of the Lithuanian science system. Examining how these reports presented and addressed the "underperforming" narrative for local audiences offers insights into the evolution of national research assessment.

1.3. External validation and internal tensions in policymaking

This section examines the role of state-level reports in responding to international assessments of Lithuania's research and innovation performance. In the early years of Lithuania's independence, state-commissioned reports played a crucial role in aligning national research priorities with European standards. A prime example is the White Paper on Lithuanian Science and Technology, prepared in 2001 (*Lithuanian Science and Technology*, 2001) in close collaboration with academia during the Lithuanian bid for EU membership. This white paper advocated for stronger state responsibility in internationalisation efforts and led to concrete policy outcomes.

Building on these early efforts, the establishment of the Research and Higher Education Monitoring and Analysis Centre (MOSTA) in 2007 marked another significant shift in Lithuanian science policymaking. This move further solidified the influence of international assessments on shaping the national research landscape.

1.3.1. Navigating the science system and policymaking obstacles

The establishment of MOSTA marked a new era for Lithuanian science policy. MOSTA played a crucial role in shaping the national science system by producing and commissioning

numerous reports that analysed the higher education system and provided evidence-based recommendations. One of the first such reports focused on the internationalisation of Lithuanian science (Leichteris and Stumbrytė 2008). It reviewed the international assessment reports discussed in Subsection 1.2.1 and offered twelve recommendations, including developing a clear vision for science in Lithuania, establishing a long-term R&D strategy, and involving international experts.

A study commissioned by MOSTA in the same year (Augustinaitis, Rudzkienė, et al. 2008) investigated inter-institutional coordination in Lithuanian science policy. This study highlighted the need to align European research priorities with actual research conducted at the institutional level. A subsequent MOSTA summary (Augustinaitis, Bumelis, et al. 2008) likened the policymaking process to navigating between global trends (a "coordination funnel") and powerful stakeholder groups disrupting the intended course ("pirate ships"). This "hierarchical anarchy," the authors imputed this "hierarchical anarchy" to a lack of leadership and excessive stakeholder influence leading to a fragmented decision-making process.

These challenges in coordinating and implementing research policy were further highlighted in a 2009 meta-analysis of international assessment reports (MOSTA 2009a). The analysis revealed a persistent disconnect between the aspirations of these assessments and the realities of domestic policy implementation. Despite the emphasis on goals such as internationalisation and increased research productivity, concrete strategies and actions within the Lithuanian context were lacking. This further highlighted the need for more effective communication and a deeper understanding of the complexities within the Lithuanian science system when implementing recommendations from foreign experts.

A separate 2009 report (MOSTA 2009b) examined the critical role of policymakers in the Lithuanian higher education system. It emphasised the need for systematic policy development and implementation and highlighted the urgent need to strengthen governance capacity for lasting reforms. This study acknowledged that the 2009 Law on Higher Education and Research, while seemingly a victory for policymaking, was achieved more through individual efforts, political manoeuvring, and favourable circumstances than through robust, systematic governance. This report also revealed a growing dissatisfaction with quantitative research assessments and proposed piloting qualitative peer review approaches, a recommendation eventually adopted for all disciplines.

While MOSTA played a central role in analysing the Lithuanian science system and driving reforms, challenges persisted in coordinating policy efforts and translating recommendations into action, raising concerns about the effectiveness of policy implementation.

1.3.2. Concerns about policy implementation and the search for solutions

Despite numerous projects investigating the Lithuanian science system, concerns persist about their influence on policy implementation. The "Scholarly Lithuania 2030" project, a major undertaking in 2011, appears to have had minimal impact on the national progress strategy "Lithuania 2030" (State Progress Council 2011). This limited influence is concerning given the project's ambitious goals and extensive stakeholder involvement. Furthermore, only a

summary is publicly available (MOSTA 2011), raising concerns about transparency in policymaking.

A 2014 report by the European Science Foundation (ESF 2014) further emphasised the importance of the national progress strategy "Lithuania 2030": if "strategy is to be developed further than coordinated effort between ministries, the RCL [Research Council of Lithuania] as well as other agencies could pave the way for a more refined research and education agenda for the future." The ESF experts "formed the impression that the Ministry does not see the RCL as a key strategic player in national plans for research and development." These inconsistencies pointed to potential tensions and communication challenges within the Lithuanian science policymaking landscape.

In 2014, the Technopolis Group was commissioned to propose a new research assessment process (Arnold and Angelis 2014). They recommended a one-time, internationally-conducted Research Assessment Exercise to evaluate research-performing organisations and identify areas for improvement. Echoing earlier reports, they highlighted the imbalance in R&D funding and low internationalisation, proposing a UK-style peer-review process using international experts. A pilot peer-review assessment in 2015 (MOSTA 2015) confirmed concerns about the Lithuanian research system, including fragmented resources, insufficient funding, low research productivity, and weak internationalisation. Based on these findings, a new system incorporating quantitative metrics and qualitative foreign peer review was implemented.

Since 2018, the research funding system has included both quantitative and qualitative assessments. The Comparative Expert Assessment (CEA), conducted every five years, evaluates research units based on quality, impact, and development potential, informing the allocation of 60% of basic R&D funding (MOSTA 2018). Despite these developments, challenges persisted (MOSTA 2019), prompting calls for system redesign even as positive trends, such as increased citation indicators and international collaboration, were also reported.

1.3.3. Transforming state agencies

Following the successful implementation of the Comparative Expert Assessment and its integration into the national performance-based funding system, MOSTA underwent a significant transformation. In 2019, it was reorganised into the Government Strategic Analysis Centre (STRATA), placed directly under government authority. This shift signalled a potential emphasis on strategic analysis and evidence-based policymaking. However, STRATA primarily focused on completing MOSTA's existing projects and ceased publishing reports previously utilised by academics.

In 2022, STRATA was tasked with revising the responsibilities of key research funding institutions, including the Research Council of Lithuania (RCL) and the Agency for Science, Innovation and Technology (MITA) (Viliūnas et al. 2022). A project to establish a Competence Centre for Evidence-Based Governance included an assessment of the RCL's implementation

of recommendations made by the European Science Foundation (ESF 2014) on research structures and performance.

This 2022 assessment, however, appears to have been influenced by pre-existing tensions between the RCL and the Ministry, stemming from disagreements on science policy and the RCL's accountability to Parliament rather than the Government. By commissioning this assessment based on foreign expert recommendations, the government may have strategically used external validation to support its agenda and centralise control over research funding. This raises questions about the genuine commitment to evidence-based policymaking and the potential for using foreign expertise to further domestic political goals.

Following this assessment, the government merged MITA with the Research Council, placing it under government authority. These transformations suggest a shift towards centralising control and potentially limiting the independence of research funding. While the Research Council now houses the Research and Higher Education Policy Analysis Unit, it is unclear whether this fully replaces MOSTA's functions. These developments illustrate how reports commissioned from foreign organisations can be used strategically to influence policymaking in the Lithuanian science system.

The instances overviewed in this section underscore the potential disconnect between evidence and policy action, even when external expertise is involved, and raise concerns about the long-term sustainability and self-determination of Lithuanian science policy. To gain a more comprehensive understanding of the Lithuanian science system and its response to external pressures, it is crucial to consider perspectives beyond those found in state-level reports. The following section will explore independent, non-state-agency research on higher education policies and other relevant issues in Lithuania.

1.4. Review of literature on Lithuanian research system trends

This section delves into existing studies of Lithuanian research trends, drawing from both domestic and international perspectives. It first examines critical analyses of the impact of quantitative metrics on the Lithuanian research landscape, followed by an exploration of bibliometric studies that position Lithuania within the global research context.

1.4.1. Critical voices analysing the consequences of quantitative metrics

Lithuania, with its population of 2.8 million, faces the challenge of limited human resources in research: a mere 6.8 thousand researchers hold a PhD within its entire higher education sector.[1] Furthermore, the predominance of Lithuanian-language publications hinders accessibility for international audiences, limiting global engagement with Lithuanian research. Moreover, there are no dedicated research units specifically focused on critically and systematically analysing the national science system itself. Despite these challenges, Lithuanian researchers from a variety of disciplines have made valuable, albeit occasional,

[1] Researchers in the higher education sector with scientific degree or an academic title (2023) in the Indicators Database of the Official Statistics Portal in Lithuania. https://osp.stat.gov.lt/statistiniu-rodikliu-analize#/

contributions to understanding specific aspects of their national science system. This subsection presents a topical overview of the research relevant to the development of the public science system.

In the realm of higher education reform, Želvys (2003) provided a comprehensive overview, highlighting the initial decentralisation efforts in the early 1990s and the subsequent shift towards greater state control, particularly through the introduction of performance-based funding. This centralisation, however, encountered resistance from the academic community, underlining the tension between institutional autonomy and accountability. Building upon Želvys's observations on academic resistance, Leišytė & Kiznienė (2006) examined the complex interplay between state regulation and academic self-governance in Lithuania. Their findings suggest that while new legislation aimed to reinforce university autonomy, the influence of new public management ideas was limited compared to other countries. Leišytė et al. (2015) extended this line of inquiry by exploring the implementation of Bologna Process action lines, revealing varying interpretations and challenges in adapting to international standards within Lithuanian higher education institutions. Meanwhile, Urbanovič & Wilkins (2013) focused on the role of internationalisation as a quality improvement strategy in small countries such as Lithuania. They noted that while the government had set clear internationalisation goals, it lacked a concrete national implementation strategy to guide institutions in achieving these objectives.

While these studies focused on institutional and policy changes, other Lithuanian researchers examined the impact of research assessment reforms on academia and specific disciplines. Lithuanian researchers outside research evaluation disciplines offered critical perspectives on the research assessment reforms and their incentives and consequences. Sociologist Zenonas Norkus (2001) connected ongoing debates on reforming Lithuanian science with the broader "crisis of big science" recognised by those in his field. A decade later, philosopher Aldis Gedutis (2012) provided insights into the dynamics within Lithuanian academic journals, focusing on editorial boards, authors, and institutional affiliations; he drew upon the concepts of "academic gangs" and "tribes" to explain observed patterns and changes. Furthermore, mathematician Rimas Norvaiša (2011) explored instances of Journal Impact Factor manipulation within the Lithuanian scientific community, arguing that certain administrative practices can undermine science self-governance and academic ethics. Another mathematician, Saulius Maskeliūnas (2011), reviewed the requirements for peer-reviewed journals in the national performance-based funding system and its influence on Lithuanian journal publishing trends.

Philosophers Kirtiklis and Gedutis (2020) offered a systematic analysis of research evaluation in Lithuania, drawing on theoretical frameworks and empirical evidence to examine its impact, particularly on the humanities and social sciences. Their book explored the arguments for the value of the humanities in both global and local contexts, providing valuable insights into the challenges faced by humanities scholars in the Lithuanian science system. This work is particularly crucial given the dominance of research assessment criteria derived from the natural and technical sciences, which have already negatively affected the humanities and social sciences. The authors also highlighted the "trench mentality" prevalent in Lithuanian

academia, which hinders productive discussions about the goals and value of these fields. Unfortunately, this book is in Lithuanian and only available in print, making it difficult to access for an international audience. In a related journal article, (Gedutis and Kirtiklis 2023), guided by the fear and feeling of injustice, reconstructed different types of the notions of quality which are crucial for a deeper understanding of the outcomes of qualitative research assessment and peer review practices.

Beyond these qualitative critiques, some researchers employed bibliometric methods to analyse trends in Lithuanian scientific publications. Developers of multi-criteria methods, Zavadskas et al. (2011) traced the evolution of scientific publications in the Baltic States over the first two decades of independence. In 2015, Dagienė, then an academic publisher, and Sandström, her Swedish co-author, examined the impact of national policy on scholarly communication and citation patterns, finding that while policy changes led to increased pressure on national journals, these journals also demonstrated adaptability and resilience (Dagienė and Sandström 2015). Maskeliūnas et al. (2015) further analysed the frequent changes in evaluation criteria, highlighting the Ministry of Science and Education's ongoing efforts to balance the fair distribution of funding with the encouragement of high-level research.

It appears these studies were conducted on an ad hoc basis, with few available in English. Reacting to policy decisions rather than proactively examining the system, many of these studies flagged problems within academia that are outcomes of policymaking. Though offering diverse perspectives, these papers, originating from researchers outside science and technology studies, lacked a cohesive framework. The fragmented approach observed from this research indicates the absence of dedicated research units specifically tasked with conducting systematic, independent analysis for comprehensive understanding of the science system as a whole.

1.4.2. Lithuania in the foreign research landscape

Complementing foreign expert assessments, bibliometric studies offer data-driven insights into Lithuania's scientific journey, emphasising both progress and persistent challenges. Lithuania was recognised as part of a core group of countries with international co-authorship relations in 2000 (Wagner and Leydesdorff 2003). But broader analyses of research openness and citation impact (Wagner et al. 2018) have continued to underscore Lithuania's challenges in achieving high levels of research impact and international collaboration.

Early on, Allik (2003) highlighted the financial constraints facing the Baltic states, noting low R&D expenditure as a potential roadblock to a knowledge-driven society. A decade later, Ukrainski et al. (2014) observed a concerning decline in full-time equivalent researchers in Lithuania in 2009, analysing scientific cooperation patterns of small European countries. However, they also indicated steady growth in Lithuania's share of co-publications with top 100 European institutions, suggesting progress in international collaboration.

Yet, even amidst these limitations, Teodorescu and Andrei (2013) found certain Lithuanian journals achieving relatively high Impact Factors, though potentially aided by within-group

citations. This duality of promise and constraint continued to emerge. Grančay et al. (2017) focused on Business & Economics publications, highlighting the phenomenon of "local articles" published in journals within Central and Eastern European countries, including Lithuania. This study raised concerns about the quality of some of these journals and the potential influence of personal connections on publication decisions. Going further, Lauk and Allik (2018) offered a more critical perspective, suggesting that Lithuania had prioritised developing a "cottage industry" of national journals instead of competing for publication in leading international outlets.

Lithuania has also been featured in broader bibliometric studies, including analyses of social sciences and humanities in Eastern Europe (Pajić 2014), as well as benchmarking European post-Socialist countries (Zgrabljić Rotar, Jokić, and Mateljan 2018) and post-Soviet countries (Chankseliani, Lovakov, and Pislyakov 2021). The latter highlighted Lithuania's impressive growth in scientific publications between 1993 and 2019, with a 1,522% increase since independence, surpassing both Estonia (842%) and Latvia (336%). However, the research also pointed to a lag in international collaboration. In 2019, 74% of Estonian and 73% of Latvian articles had foreign co-authors, compared to only 57% of Lithuanian ones. While this study provided valuable insights, it did not track these trends on a year-by-year basis, leaving room for further research into the nuances of Lithuanian research development.

Additionally, Lithuania was included in studies examining dissertation publishing (Goedeken and Hérubel 2018) and internationalisation at the country level, where Eastern European countries generally have marginal shares of foreign academic staff (Lepori, Seeber, and Bonaccorsi 2015). Some analyses also touched upon Lithuania's research assessment policies. Sivertsen (2017) mentioned the use of bibliometrics in informing research evaluation panels in Lithuania, while Kulczycki (2018) noted similarities in criteria for evaluating books in the social sciences and humanities between Lithuania and other countries.

While bibliometric analyses offer valuable insights into the outputs and impacts of the Lithuanian science system, a deeper understanding requires examining the national research assessment system that shapes these trends. The following section provides an overview of the Lithuanian quantitative research assessment system and its evolution.

1.5. Lithuanian quantitative research assessment

As outlined in the previous sections, the rise of quantitative research assessment was a global phenomenon. This trend was particularly pronounced in Lithuania due to its pursuit of rapid internationalisation following the restoration of state independence.

1.5.1. The rise of metrics and its consequences

Following its separation from the Soviet Union, Lithuania embarked on a path of scientific internationalisation, seeking to integrate its research system into the global knowledge market. This ambition led to the development of a quantitative research assessment system designed to incentivise internationally recognised publications and boost research performance. This system, encompassing regulations for degrees, qualifications, and funding, reflects the

historical context of Lithuania's transition and its aspiration to achieve rapid progress in the international research arena.

Three decades after regaining its independence, the Lithuanian scientific landscape is overly focused on metrics. There is a growing sense of cynicism within the scientific community about their own academic system. Academics say the system does not promote individuals based on groundbreaking discoveries or life-changing inventions. Instead, they say, promotion goes to those who publish in journals with the highest impact factors or climb the questionable rankings or belong to some influential academic groups.

The quantity of publications and the prestige of the journals they appear in have become the primary measures of success, overshadowing the actual content and societal relevance of research. Universities celebrate publications in "high-impact" journals or with "prestigious" publishers, while the public is left in the dark about the true meaning and importance of these "valuable" studies made by "significant" academics.

This overemphasis on metrics has even permeated the national science awards, where those with numerous publications in high-impact journals are often favoured, leading to a growing consensus within Lithuanian academia that it is time to get rid of this flawed system. Meanwhile, the younger generation asks how we became so addicted to these numbers and metrics even as it struggles to imagine alternatives. However, in order to envision such alternatives, it is indeed important to understand how this quantitative research assessment system evolved, how it operates, and how it influences researchers and their institutions.

This emphasis on quantitative assessment is deeply rooted in Lithuania's post-independence pursuit of scientific internationalisation. Regaining independence brought dramatic changes to everyday life, including the need to rebuild governmental institutions and adapt to a new economic reality (Bikales 1997). This context created pressure for rapid results, leading policymakers to adopt a quantitative research assessment system focused on rapid progress in the international research arena. Thus, policymakers developed a quantitative research assessment system, gradually refined over time, which incentivises publications in internationally recognised journals and books from prestigious publishers.

To better understand how this emphasis on quantitative assessment has shaped the Lithuanian research landscape, the next subsection examines the key pillars of this system.

1.5.2. Key pillars of the quantitative research assessment system

Figure 1 illustrates this metrics-based system that impacts the behaviour and priorities of Lithuanian researchers. The figure summarises the main strands of this system: regulations on awards of scientific degrees and academic ranks, minimum qualifications for researchers' and lecturers' employment, and a performance-based funding system for state funding allocation to institutions.

Initially, policymakers in Lithuania introduced an *All-in-One Regulation for Scientific Degrees and Academic Titles* (1992–1998). This comprehensive national legal act established a framework of rules governing the awarding procedures and candidate requirements for both

scientific degrees (PhD and Habilitated Doctor, a higher doctorate) and academic titles (Professor and Associate Professor). Universities and research institutes were mandated to incorporate these rules into their institutional policies. Early versions of the regulation, such as the 1993 wording, stressed the importance of publishing in international journals for Habilitated Doctor candidates but did not specify a minimum number of publications required. However, by 1996, quantitative requirements were introduced. For example, PhD candidates needed at least two papers in journals listed in the List of Lithuanian Journals. Habilitated Doctor candidates required 15 papers in nationally and internationally recognised journals, or at least 8 papers if accompanied by a monograph. Candidates for the title of Professor had to be habilitated doctors with additional publications in recognised journals or a monograph or textbook since their habilitation.

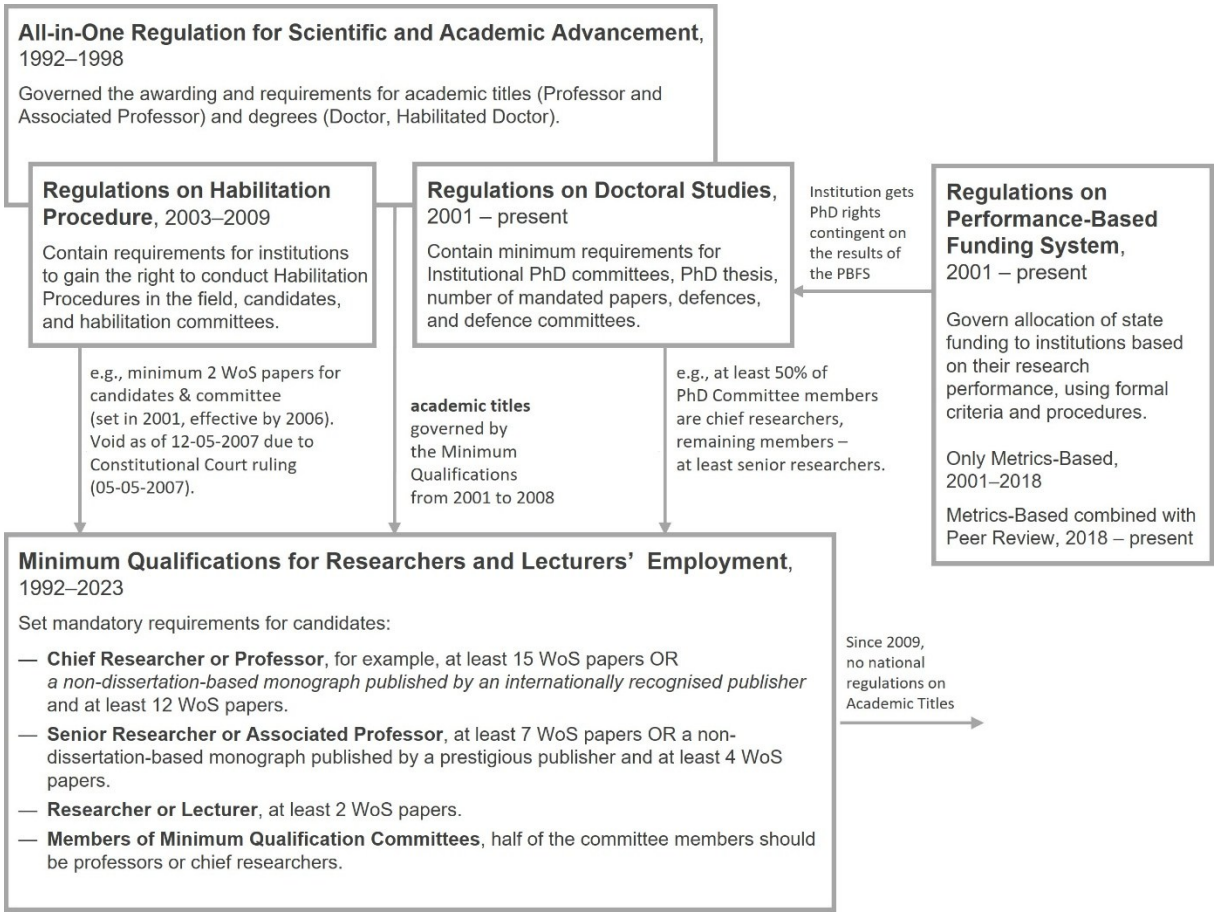

Figure 1. Key pillars and quantitative requirements in Lithuanian research assessment (1992–present).

Subsequently, the scientific degrees were governed by separate legal acts: the *Regulation on Habilitation Procedure* (2003–2009) and the *Regulation on Doctoral Studies* (2001–present). The requirements for attaining academic titles (Professor and Associate Professor) in 2001–2008 were intertwined with the *Minimum Qualifications for Researchers' and Lecturers' Employment* (1992–2023). However, the previously mentioned 2009 revision of the *Law on Science and Studies* delegated the authority to set specific qualification requirements, including publication numbers, to individual institutions. While the law mandated that these

institutional standards must be at least as rigorous as the national minimum qualifications, it allowed for greater autonomy and flexibility. This resulted in a landscape where many institutions opted to implement even more stringent criteria for academic advancement than those stipulated at the national level.

The former *Regulations on Habilitation Procedure* (2003–2009) established a prestigious academic qualification in Lithuania, recognising researchers who had made substantial contributions beyond their doctoral work. This qualification signified mastery of research methodology, the ability to articulate complex ideas, and a commitment to advancing their field. It served as a gateway to top academic positions such as professor or chief researcher. From its inception, the regulation outlined specific requirements for institutions, candidates, and committees involved in the habilitation process. Institutions seeking authorisation to conduct habilitation needed a minimum of five researchers (with at least three in the relevant field) holding professor or chief researcher positions and fulfilling the Minimum Qualifications for a 3- or 5-year term. Habilitated Doctor candidates were required to have published at least 15 peer-reviewed papers after completing their PhD, including a minimum of two indexed in Web of Science (WoS) journals. However, these strict mandatory requirements for a minimum of two WoS papers for both candidates and committee members, implemented in 2001 and in effect by 2006, were later nullified on May 12, 2007, due to a Constitutional Court ruling. The implications of this ruling will be further elaborated upon in this thesis.

1.5.3. Long-lasting regulations and requirements

Similar to the Habilitated Procedures regulations, *Regulations on Doctoral Studies* (2001–present) also outline specific requirements for institutions, candidates, and committees involved in PhD studies and defences.

Institutions gain state-funded PhD study rights and the number of PhD students they can admit based on their performance-based funding system results and the availability of qualified researchers. For example, to qualify, institutions must have at least 11 and no more than 15 researchers (including foreign fellows), with at least half holding professor or senior researcher positions in the relevant doctoral study disciplines. The qualifications of these researchers should align with those set in the *Minimum Qualifications for Researchers' and Lecturers' Employment*.

Defence committees are also subject to regulations, such as ensuring that their members have no co-authored papers with PhD candidates and that more than 50% have no co-authored papers with the supervisors within the past five years. These requirements, like those for PhD candidates, have evolved over the years. Since the introduction of the regulations in 2001, candidates have consistently been required to have at least two peer-reviewed papers for their defence.

However, the specific journal requirements have changed over time. Initially, all disciplines required one paper in a WoS journal and one from the List of Lithuanian Journals (2001). This shifted to two papers in either WoS journals or the List of Lithuanian Journals in 2002, then

to simply two peer-reviewed papers in 2003 (this is linked to the Constitutional Court case explored in this thesis).

Stricter requirements emerged in 2017, mandating at least two peer-reviewed papers (one international) for social sciences and humanities, and WoS journals with impact factors for the sciences. By 2020, social sciences and humanities PhD candidates needed two papers with at least one in WoS or Scopus. Other disciplines required two WoS papers in journals having an impact factor. Thus, while the overall requirement for two papers has remained stable, the specific journal criteria have become progressively more demanding.

Minimum Qualifications for Researchers' and Lecturers' Employment (1992–2022) established the criteria for holding academic positions at state universities and research institutions, ranging from chief researcher to junior researcher, and from professor to lecturer. It also outlined requirements for members of qualification committees, which mirrored those in previous regulations, such as mandating that at least half of the committee members be professors or chief researchers.

As with academic advancement, the minimum number of required papers for senior positions remained largely consistent since 2001. For example, chief researcher or professor positions required at least 15 peer-reviewed journal papers, or a non-dissertation-based monograph published by an internationally recognised publisher along with at least 12 papers in similar journals (Research Council of Lithuania 2022). Candidates for senior researcher or associate professor positions needed at least seven papers, or a non-dissertation-based monograph from a prestigious publisher plus at least four additional papers. Those seeking researcher or lecturer positions needed a minimum of two papers, while junior researchers had no specific requirements for their journal papers.

As previously explained, the criteria for acceptable journals evolved over time, shifting from the List of Lithuanian Journals and the National List of Databases to WoS journals with journal impact factors, mirroring the trend observed for PhD candidates.

While institutions were required to set their own qualification requirements in line with these national standards, they could not be lower than the minimum requirements specified in the regulations. The 2007 revision of the regulation removed the exact requirements for 3- or 5-year terms, granting institutions greater autonomy in setting these criteria, while strongly recommending alignment with the output and position requirements detailed in the regulation.

1.5.4. The Performance-Based Funding System (PBFS)

The *Regulations on the Performance-Based Funding System* (PBFS), in effect since 2001, emphasise a shift from state-level requirements to individuals to institutional research assessment. They represent the final pillar of Lithuania's quantitative research assessment framework, as illustrated in Figure 1. These regulations govern the allocation of state funding to universities and research institutions, linking financial support directly to their research performance based on established criteria and procedures.

While the first metrics-based research assessments, considering publications in ISI (now Web of Science) journals, were conducted between 1996 and 2002 (Daujotis et al. 2002), the official methodology for the metrics-based PBFS was launched in 2001. This marked the beginning of an era of quantification in Lithuanian research assessment, with institutions annually reporting their outputs (monographs, journal papers, patents, and research projects) to secure state funding. From 2006 onwards, *monographs published by prestigious international publishers* and papers in *WoS journals* garnered significantly more funding points than those from other sources.

To further emphasise the value placed on international recognition and research quality, policymakers added a new indicator in 2017— top-10% citation-ranked papers by WoS category—which also earned funding points for institutions. Nevertheless, in 2014, Lithuania piloted a peer-review-based PBFS, inviting international panels to evaluate institutions (Arnold and Angelis 2014).

After this pilot, the 2018 PBFS, which incorporated peer review, was used to allocate 60% of the basic state funding for R&D. However, the annual metrics-based PBFS remains in place, accounting for the remaining 40% of state funding allocated annually (Research Council of Lithuania 2022). Notably, the outputs deemed most valuable in the PBFS (monographs from prestigious publishers and high-impact WoS journal articles) also feature prominently in the minimum qualification requirements for academic advancement, creating a strong incentive for researchers to prioritise these publication outlets.

1.5.5. The role of national lists

From 1993 to 2009, two exclusive lists, the List of National Journals and the National List of Databases, were introduced and developed within the research assessment system. Only papers in journals from those lists were eligible for purposes of employment, promotion, scientific degrees, or membership on influential committees. The use of these lists as instruments in research assessments and promotions was discontinued because of burdens and obstacles policymakers met developing these lists.

Taking a broader view, the research assessment system in Lithuania, as visualised in Figure 1, has evolved into a multifaceted structure emphasising quantitative metrics: particularly those tied to publications in internationally recognised journals and books from prestigious publishers. This quantitative approach reflects the drive of policymakers to enhance the standing of Lithuanian research and its integration into the global scientific community. However, whether these efforts have translated into tangible success and international recognition remains an open question, as the negative narrative of Lithuania "lagging behind" is still being used in foreign and state-level reports.

As internationalisation of science and performance-based funding systems have become pervasive around the globe, their impact on research and academia has been profound. Focusing on Lithuania as a case study, this thesis examines the intricate relationship between quantitative research assessment, aimed at boosting national outputs and improving indicators of internationalisation, and the unintended consequences of such assessment. While

Lithuanian policymakers have actively pursued research internationalisation and implemented quantitative research assessment instruments, there have been no independent studies comprehensively investigating the outcomes of these policies and regulations.

1.6. Research objectives, approach, and research questions

1.6.1. Research objectives

This PhD thesis pursues three objectives. First, it aims to understand the evolving paths of research assessment in transitioning science systems. Lithuania serves as an empirical case study here, representing former Soviet countries transforming their science systems to integrate into the global research landscape. Furthering the understanding of research assessment development, this PhD thesis studies the influence of quantitative research assessment metrics on publishing behaviour within such transitioning systems. Second, this research aims to contribute to the development of more effective and responsible research assessment frameworks, particularly for smaller countries navigating the challenges of research internationalisation. Third, this research aims to contribute to the development of policymaking theories and understanding of policy dynamics within public science systems, with implications for smaller countries seeking to internationalise their research.

1.6.2. Research approach

This PhD thesis provides an in-depth case study of the development and implementation of quantitative research assessment policies. It *utilises a multi-level perspective*, examining research assessment at the national, institutional, and individual levels and considering the interactions and power dynamics among various stakeholders. Furthermore, the research *employs longitudinal analysis*, tracing the evolution of the research assessment policies over three decades and examining their changes and adaptations in response to unintended consequences and actions taken by institutions and individuals. Finally, this PhD research *adopts a mixed-methods approach*, combining qualitative insights from interviews, policy documents, and grey literature with quantitative bibliometric analysis of journal papers and scholarly books.

1.6.3. Research questions

This PhD research is guided by five research questions presented in this section. Each question, addressed in a separate chapter of this thesis, reflects the multifaceted nature of the quantitative research assessment system developed in Lithuania over three decades. This system has incentivised papers in high-impact Web of Science journals and books published by foreign, internationally recognised publishers, leading to a complex interplay of intended and unintended consequences for researchers, institutions, and the Lithuanian research landscape as a whole. The research questions below delve into this system and its outcomes, exploring its development, implementation, and impact.

RQ1: How have multi-actor dynamics within and outside the Lithuanian science system influenced the development and implementation of national research assessment policies?

Lithuania, seeking internationalisation and integration of national research into the global scientific community, set ambitious goals to achieve tangible results rapidly. This ambition led policymakers to employ quantitative research assessment, prioritising papers in international journals indexed in the Web of Science (WoS) databases. This journey involved a transition period where policymakers compiled national journal lists to guide research output from primarily domestic publications towards internationally recognised journals. However, this emphasis on WoS publications and the transition process itself were influenced by a complex interplay of actors within and outside the Lithuanian science system.

By analysing policy documents, bibliometric data, grey literature, and interviews with policymakers, researchers, and other stakeholders, Chapter 2 investigates the interplay among various actors, including science policymakers, research assessment experts, publication data providers, and academic researchers. It examines how these actors have interacted to shape the trajectory of research assessment in Lithuania, particularly the focus on WoS publications as a key indicator of research quality and internationalisation. Exploring the challenges and unintended consequences that have arisen in policymaking processes, Chapter 2 demonstrates the proliferation of institutional journals and the influence of commercial databases on policymaking decisions.

Crucially, Chapter 2 examines how the imposition of disproportionate and stringent requirements for WoS publications on social sciences and humanities (SSH) disciplines by influential scientific elites from the natural sciences led to strained interdisciplinary relationships and diminished respect between Lithuanian academics in different disciplines. This conflict, stemming from differing disciplinary norms and expectations, fuelled concerted efforts by SSH scholars to safeguard their unique research traditions. These efforts ultimately culminated in a Constitutional Court case that highlighted the need for a more balanced and inclusive approach to research assessment.

RQ2: How have the strategies of policymakers, institutions, and researchers shaped the development of the Lithuanian Performance-Based Funding System?

The Lithuanian Performance-Based Funding System (PBFS), like those in many countries, aims to enhance the effectiveness of national research. Similar to the PBFSs in Poland (Korytkowski and Kulczycki 2019; Kulczycki et al. 2017) and the Czech Republic (Good et al., 2015; Stöckelová 2012), the Lithuanian PBFS initially involved a set of eligible outputs (journal papers and books) with assigned funding points. Expert panels were tasked with ensuring fair judgement in assessing whether submitted outputs fit the descriptions and metrics of eligible outputs. However, this state funding allocation system has undergone significant changes since its introduction in 2001.

Chapter 3 delves into the development of the Lithuanian PBFS, examining how interactions among policymakers, institutions, and researchers have shaped its evolution and impacted research evaluation practices. It analyses national PBFS policies, bibliometric data, grey

literature, and interviews with various stakeholders to identify the multi-level dynamics within the Lithuanian PBFS.

Chapter 3 also traces changes in the PBFS regulations, analysing how policymakers have navigated the tension between international aspirations and domestic realities while responding to unintended consequences and publicly expressed pressures. These pressures have come not only from actors within the Lithuanian science system but also from professional organisations of Lithuanian researchers working abroad or those who obtained their PhDs at foreign universities. Active researchers, driven by a desire to contribute to the advancement of Lithuanian science, played a significant role in advocating for reforms and shaping the public science system.

This chapter also illustrates how universities and researchers have adapted their strategies to maximise their performance, thereby contributing to the development of PBFS regulations. This analysis examines the interplay among state institutions, higher education authorities, scientific elites, and individual researchers, highlighting their diverse interests and influences on the public science system.

Furthermore, Chapter 3 explores the challenges and unintended consequences that have arisen, such as the proliferation of institutional journals, the influence of commercial databases, and the strategic responses of universities and researchers. It also examines how policymakers have addressed these challenges through policy adjustments and the introduction of new instruments, such as the journal suspension policy. Through this analysis, Chapter 3 aims to provide a deep understanding of the complexities and dynamics inherent in quantitative research assessment systems.

RQ3: How do European countries evaluate books submitted as research outputs, and how consistent are these evaluation practices across different countries?

Chapter 4 investigates the diverse approaches to scholarly book evaluation in Europe, focusing on monographs in the social sciences and humanities. These approaches vary significantly, from expert panels assessing individual books to rankings of book publishers. Through a comparative analysis of assessment practices in the UK, Norway, Denmark, Finland, Spain, Poland, and Lithuania, this chapter highlights the challenges inherent in these different systems.

Lithuania, where publisher prestige plays a significant role in national research assessment, serves as the source for empirical data. Here, national research assessment policies still incentivise publishing with internationally recognised publishers. To illustrate the inconsistencies in this approach, Chapter 4 examines the fluctuating rankings of book publishers in Lithuania between 2004 and 2016, where the same publishers were variously categorised as prestigious (for both SSH and the sciences) and ordinary (for SSH only) or marginal (not-prestigious for the sciences only). Furthermore, a comparison with the rankings of these publishers in the Norwegian Register, which employs a similar system of book evaluation, raises questions about the effectiveness and consequences of relying on publisher prestige as a primary book evaluation metric.

Finally, this chapter identifies the specific criteria and procedures used to determine book publishers' standing in different research assessment systems and discusses the implications of these variations for research evaluation and funding allocation. Exploring book evaluation practices across countries, this chapter aims to contribute to a deeper understanding of the outcomes associated with assessing books by their publishers.

RQ4. How can the ISBN Manual and the Global Register of Publishers (GRP) be utilised to identify the actual publishers of books and their roles in book production?

It is important for the development of effective research assessment policies to identify the actual publishers of scholarly books submitted as research outputs and recognise the publishing practices at work. However, the evolving landscape of academic publishing, with its complex web of imprints, mergers, and acquisitions, presents significant challenges in this regard.

To further understand the implications of focusing on publisher prestige in research assessment, and to assess whether such policies produce their intended consequences, Chapter 5 examines the books submitted as research outputs in the Lithuanian quantitative research assessment system and the UK's Research Excellence Framework (REF) in 2014 and 2021. This analysis offers a comparative perspective between the UK and Lithuania, using the book ISBN metadata available in the GRP. Specifically, Chapter 5 uncovers the definitions and guidelines provided in the ISBN Manual regarding book publishers and their roles. It also analyses the GRP data to identify the actual publishers of books submitted for institutional research assessment in Lithuania and the United Kingdom from 2008 to 2020.

Chapter 5 presents a systematic examination of the ISBN Manual and the GRP, evaluating their suitability in determining key book attributes such as genre, publisher, country of publication, and publisher category (e.g., academic, university, non-publisher, self-publisher). This analysis demonstrates the complexities and challenges encountered in identifying book publishers because of multiple imprints, mergers, and acquisitions. It also explores the potential of the GRP as a valuable, yet underutilised, data source for bibliometric analyses.

RQ5. To what extent does WorldCat metadata reflect the effectiveness of Lithuanian research assessment policies in enhancing the visibility of nationally authored books?

The WorldCat catalogue is a primary source of book metadata in bibliometric research. The presence and quality of metadata for Lithuanian books in this source can indicate the effectiveness of national research assessment policies. These policies incentivise publishing with prestigious international publishers to maximise the visibility and impact of national research. Chapter 6 investigates the extent to which this strategy translates to book discoverability and presence in this international library catalogue.

To gain a broader perspective on research visibility, Chapter 6 examines metadata of books from both Lithuania and the UK, drawing on the same book ISBNs as in Chapter 5. These books were submitted as research outputs in Lithuania's research assessment system and the UK's REF2014 and REF2021. As shown in Chapter 5, academic publishers produced two-

thirds of the books submitted to the UK's REF, while they issued only a quarter of Lithuanian books, with universities themselves producing half.

Chapter 6 investigates the representation of these books in WorldCat. It examines the availability and completeness of metadata elements (e.g. authors, titles, language, publication year) essential for library cataloguing and reveals the status of Lithuanian books within this major source of research data. By identifying the primary contributors to metadata availability, this research informs strategies to maximise the visibility of national books. It also highlights potential challenges involving metadata providers (beyond publishers) and opportunities for improving the representation of books authored by Lithuanian researchers in WorldCat, increasing the visibility of national research.

1.6.4. Thesis outline

This chapter provided the essential context for understanding the evolution of the quantitative research assessment system in Lithuania and the nuances of its development. It has also outlined the research approach and research questions that guide this thesis. Chapters 2 to 6 delve deeper into the five research questions, providing a comprehensive analysis of the Lithuanian case and its implications for research assessment policies both domestically and internationally. Chapter 7 summarises the main findings of this PhD thesis. Based on these general findings, the dissertation concludes with policy recommendations and directions for future research.

Chapter 2.
Multi-actor policy dynamics in research evaluation: Experts, databases, and academics

This chapter is based on:
Dagienė, E., Waltman, L., & Dix, G. (2025). Multi-actor Policy Dynamics in Research Evaluation: Experts, Databases, and Academics. *Higher Education Policy*. https://doi.org/10.1057/s41307-025-00397-0

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Conceptualisation: ED, GD, LW.
Investigation: ED, GD, LW.
Supervision – GD, LW.
Writing – original draft: ED.
Writing – review & editing: GD, LW.

2.1. Introduction

When Lithuania regained independence in 1990, its academic community was largely isolated and geared towards Soviet patrons (Allik 2003; Želvys 2003). A decade later, Lithuanian universities had substantial autonomy and a quite elaborate bureaucratic structure of science policymaking. In the meantime, Lithuanian higher education policies had undergone intense development, with internationalisation as a primary goal (Greblikaitė, Barynienė, and Paužaitė 2015; Urbanovič and Wilkins 2013). This push led to the adoption of quantitative research assessment, specifically author- and journal-based metrics, to drive decisions about research funding, recruitment, and promotion.

With its emergent focus on internationalisation and quantitative research assessment, Lithuania was part of a global development in which national governments fostered international cooperation to strengthen their research systems (Crăciun and Orosz 2018). The Lithuanian reform process, though not linear, was underway. It ignited complex policy dynamics between actors within and outside the science system, caught between Soviet academic traditions and new public management ideas (Leišytė and Kiznienė 2006). By examining how these multi-actor dynamics unfold over a longer timeframe, this paper aims to understand the resulting developments in the conduct, publication, and assessment of research.

In the various subfields of research on research—e.g., sociology of science, science policy literature, and scientometrics—longer-term multi-actor dynamics do not always obtain the empirical attention they deserve. Sociologists of science, for instance, tend to examine the centralised management of knowledge production and university governance. They perceive the science system as state- and employer-dominated, with a focus on state agencies shaping policies, funding research, and driving university changes (Whitley and Gläser 2014; Whitley, Gläser, and Engwall 2010; Whitley, Gläser, and Laudel 2007). When sociologists do study relations among multiple actors, they favour a more unidirectional approach—as in the influence of science governance arrangements on the production of knowledge—over a dynamic one (Gläser 2019; Gläser and Laudel 2016).

Science policy literature understand science policymaking in terms of delegation (Rip and Meulen 1996). In an economics-infused understanding of science policy, one actor group is referred to as the 'principal' (usually the government), who then delegates to 'agents' (usually researchers) a 'task'—say, publishing scientific articles in high-ranked international journals—they must accomplish to meet the principal's demand (Borrás and Edquist 2013; Braun 2003; Potì and Reale 2007). While there is much to gain from these studies, the emphasis on delegation makes it challenging to understand dynamic science policy processes where multiple actor groups interact, and where the definition of an academic task is exactly what is at stake.

In scientometrics, finally, methodological discussions on indicator development tend to trump multi-actor policy dynamics. The scientometric literature on internationalisation, for instance, offers rich discussions on bibliometric indicators for international cooperation (van den Besselaar et al. 2012; Kehm and Teichler 2007; Robinson-Garcia and Ràfols 2020). Many

studies point out that indicators used in the (political) assessment of research are complicated (Wilsdon et al. 2015; Wouters 1997; Wouters et al. 2015), even problematic, measures to capture internationalisation (Gazni, Sugimoto, and Didegah 2012; Katz and Martin 1997; Wagner et al. 2001; Wagner, Park, and Leydesdorff 2015). While methodologically sophisticated, the scientometric literature is only loosely connected to real-world science policy.

Due to the emphasis on single organisational units, delegation, and indicator methodology, there is relatively little systematic social scientific research on the policy dynamics through which quantitative performance indicators are developed, used, contested, and altered over time. To make up for that lacuna, this paper draws its methods from literature on multi-actor policy dynamics beyond the domain of higher education. This literature includes, among others, the Advocacy Coalition Framework, which traces how different actor groups interact and to what consequence for public policymaking (Sabatier 1988; Sabatier and Weible 2007), and the Multiple Streams Framework, which aims to understand policy processes with a particular focus on the process of agenda-setting (Guidara 2021; Knaggård 2015; Zahariadis 2007).

In line with these frameworks, we specify four actor groups that are pivotal to understanding Lithuanian policymaking processes in higher education: science policymakers, research assessment experts, publication data providers and academic researchers. We identify three distinct multi-actor dynamics relevant for the development of Lithuanian science policy (Figure 1). First, we discern an expert dynamic between domestic policymakers and international research assessment experts. Here, we focus on the attempt of national policymakers to actively translate international standards of excellence, brought in by international expert judgement, to new domestic contexts. Second, we elaborate on a database dynamic among science policymakers, publication data providers and journal editors and publishers. The dependency of science policymakers on publication databases and journal publishers for quantitative assessment creates a dynamic on its own. Finally, we study an academic dynamic in which policymakers and researchers at universities respond to one another. That is, researchers are not passive recipients of policy changes but vocally problematise and challenge the bibliometric assessment of their work.

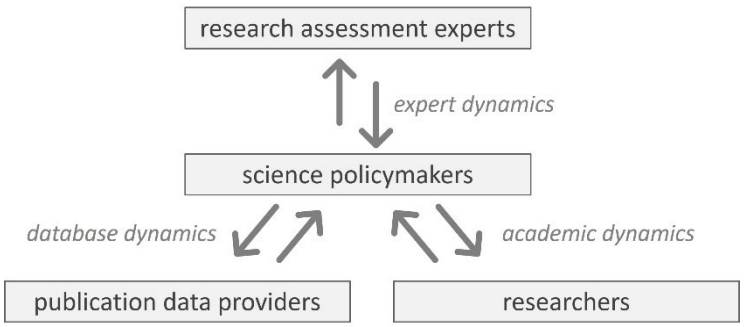

Figure 1. Three multi-actor dynamics in science policymaking.

Within the context of these dynamics, we empirically trace longer-term developments in the Lithuanian science policy agenda. For reasons of feasibility, we focus on the first phase of quantitative assessment between 1996 and 2008, showing where the policy push for quantitative research assessment originated and how it developed over time through interaction between science policymakers and the other three actor groups. While we concentrate on a particular period in the development of Lithuanian science policy, our findings can provide insight for understanding developments in metrics-based research assessment more generally—for instance, in ongoing developments related to the Coalition for Advancing Research Assessment (CoARA), established by the European Commission together with the European University Association and Science Europe in 2022.

2.2. Data sources and methods

We employed a mixed-methods approach to analyse dynamics within the science system as the formal system for producing, evaluating and coordinating scientific knowledge (Gläser and Laudel 2016). We used data from a range of sources: policy documents, bibliometric data, semi-structured interviews, and relevant grey literature on Lithuanian research and research assessment. Below we discuss these data sources in more detail.

2.2.1. Lithuanian documents on research assessments

We started by analysing Lithuanian regulations, decrees, and policies on research assessment. These policy documents set criteria for evaluation of Lithuanian researchers, universities, and research institutions; the results of those assessments substantially influence researchers' advancement in academia and the allocation of institutional research funding by the government. After examining legal acts, we identified four types of national-level resolutions relevant to different research assessments:

1. The Law on Higher Education and Research.
2. Policy documents on the doctorate process, scientific degrees (PhD, Doctor Habilitatus), and pedagogical titles.
3. Regulatory documents on minimum qualification requirements and salaries of researchers and lecturers employed at state academic institutions.
4. Regulations of the Performance-Based Funding System used to allocate state funding for institutions.

The text of these statutes and regulations is freely available in the Register of Legal Acts managed by the Office of the Seimas of the Republic of Lithuania; however, the majority of them are in Lithuanian only (see https://www.e-tar.lt/portal/en/index).

2.2.2. Bibliometric analysis

The Lithuanian research assessment regulations sought to incentivize Lithuanian researchers to publish in international journals, thereby gaining better visibility for Lithuanian research. The most valued outputs were papers published in journals indexed by the Web of Science (WoS) databases. Hence, to oversee the results Lithuania achieved between 1996 and 2008,

we collected the number of articles and reviews with at least one coauthor affiliated with any Lithuanian institution from the CWTS in-house version of the WoS databases: the Science Citation Index Expanded (SCIE), the Social Sciences Citation Index (SSCI), and the Arts and Humanities Citation Index (A&HCI). To better understand the introduction and development of quantitative performance indicators, we also conducted a wide range of semi-structured interviews with politicians, civil servants, and researchers.

2.2.3. Semi-structured interviews

We conducted fifty-seven face-to-face or Teams interviews, about 60 minutes each, in Lithuanian and English from July 2019 to September 2023. All conversations were audio-recorded. Verbatim transcriptions of Lithuanian-language records were translated into English and coded first thematically, then analytically using the software Atlas.ti. We sought further explanations via emails or follow-up meetings if clarifications to emerging categories were needed. Figure 2 provides a detailed breakdown of interviewees, along with their institutional positions and organisational affiliations.

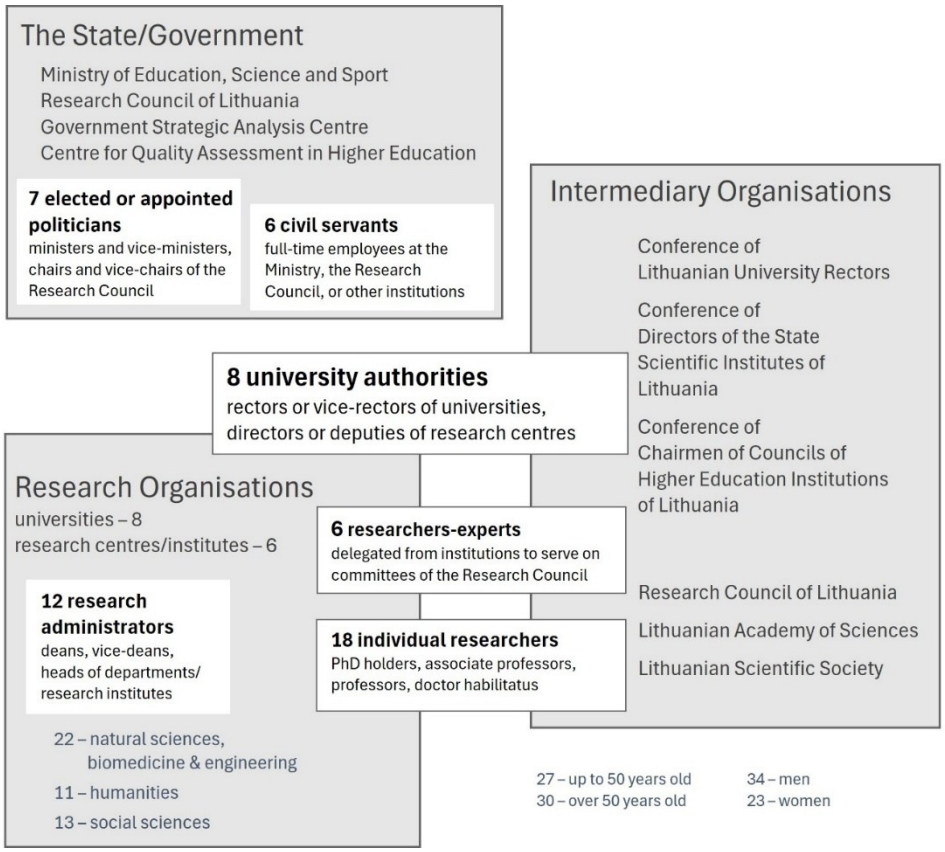

Figure 2. Composition of interviewees.

We categorised respondents into three main groups, building on public science systems research that highlights the different roles played by different actors. Policymakers (13 participants), the first group, comprise national-level politicians and civil servants, including those in government institutions. Our analysis revealed that this group also encompasses the

chairs and vice-chairs of the Research Council of Lithuania, who, despite their formal mediating role, often aligned with the state's perspective.

Scientific elites (32 participants) are those who, as highlighted by Whitley and Gläser (2014) and Whitley et al. (2010), possess both academic authority in their fields and institutional authority in science policymaking. This group includes academics serving on three expert committees within the Research Council: Humanities and Social Sciences; Natural and Technical Sciences; and Science and Studies Policy. It also extends to academics holding leadership positions within universities and research centres as well as representing their institutions at the Conferences of Lithuanian University Rectors and similar associations. While not policymakers in the strictest sense, their involvement in those intermediary organisations grants them a voice in political discourse and a collective agency to shape science policy, as described by Rip and Meulen (1996) and Henriques and Larédo (2013). Finally, academics (12 participants) are those involved in policymaking within their own institutions (universities and research centres), indirectly contributing to the development of Lithuanian research assessment policies.

The semi-structured interviews we conducted were designed to allow interviewees to elaborate on aspects of research evaluation they considered most important, appealing, or problematic. Sensitive to the different categories of interviewees, we asked respondents to share their expectations in setting research assessment rules (e.g., policymakers) and their experiences with implementing newly introduced requirements (all). The interviewees offered insights into why indicators of internationalisation were demanded and explained the logic behind the national and institutional policies that pushed researchers to publish with prestigious publishers and in the most reputable WoS-indexed journals. We promised the interviewees anonymity to enable them to share beliefs, justifications, and interpretations of situations openly.

2.2.4. Additional rulings and grey literature

We also investigated documents whose relevance became apparent when legal acts and interviews were analysed, such as the rulings of the Constitutional Court of Lithuania, reports prepared by foreign experts, and social media records related to discovered facts or information provided.

2.3. The expert dynamic: Introducing international standards of excellence in research evaluation

Policymakers, upon Lithuania's independence in 1990, sought to reorganise the entire Soviet-era science system. In the decade following initial academic reforms, Lithuanian policymakers revealed greater ambitions: successfully integrating researchers into European and global scientific knowledge production. Many Lithuanian politicians maintained a public stance that "national science doesn't exist, so internationalisation is our priority," attesting to the desire to become part of the international scientific community. Nurturing such ambitions, politicians and civil servants began to implement international practices in Lithuania.

2.3.1. Trying out qualitative evaluation from within

The first national research assessment in Lithuania took place in 1994. Policymakers intended to present the results to the government as a basis for funding allocation. As one politician explained, "Before then, the state funds for higher education and research institutions were distributed under unclear principles ... interested parties, such as state-funded institutions [universities and research centres], used to meet together and start such a tug-of-war." To develop new funding principles, the Lithuanian academic community was tasked with leading the first research assessment in January 1994 (Daujotis et al. 2002, 177). First, faculties and institutions were asked to prepare self-analysis reports. Two groups of local expert panels (peer committees) worked in parallel to evaluate the same research units and their outputs—papers, patents, and industry-academia cooperation—submitted by the institutions. The panels obtained disparate results. As one civil servant mentioned, "These chosen indicators corresponded with globally recognised measures of excellence, but our academics at that time lacked understanding of research papers." Most submitted articles had been published in domestic journals, some in the Soviet Union, and only a few in Western periodicals (Daujotis et al., 2002, 176–177).

More importantly, isolation from the West under the Soviet regime profoundly affected the culture of research assessment: the higher the academic rank of authors, the better local experts scored the authors' publications. This culture complicated Lithuanian policymakers' attempts to apply procedures, criteria, and outputs accepted by the Western scientific community. Even when expert groups working in parallel reached the same conclusion about the quality of submitted works, policymakers considered results in some disciplines unreliable simply because of the variety of output types institutions submitted for evaluation; institutions which reported everything from newspaper articles to items in domestic magazines, but no formal scholarly papers, outscored those submitting only scholarly literature (Daujotis et al., 2002, 178).

The unsatisfactory dynamics between science policymakers and national expert groups led the former to conclude that calling on people "from within" the national academic community was ineffective. After national-level consultation and research evaluation had failed, an "outside" perspective was needed to get things going. As one politician put it: "It was necessary to restructure that old science system. Everything required a specific look from the outside."

2.3.2. Inviting foreign expert judgement

Lithuanian policymakers sought this "look from the outside" in three ways. First, they decided to follow the lead of Latvia and Estonia, who, themselves newly independent, asked the Danish and Swedish research councils to evaluate their respective research systems. In 1995, Lithuanian policymakers brought in experts from the Norwegian Research Council for an external assessment. Second, that same year, Lithuania applied for EU membership. In so doing, Lithuanian policymakers began to engage with European policymakers to provide information on their national research system and its development. Finally, Lithuania's recently gained independence brought policymakers into contact with World Bank experts.

Foreign expert reports all reached a similar conclusion. The Norwegian experts pointed to a feature of Lithuanian researchers' publication practices they deemed problematic: "Too few research results are published in languages that allow communication with international academic communities. This hampers an international peer review of Lithuanian research" (Research Council of Norway 1996, 18). In line with that verdict, the Norwegian experts argued that important measures were needed "to increase international contacts and cooperation substantially through publishing in international, peer-reviewed journals (when appropriate)" (ibid., 29). In a similar vein, EU policymakers (Daujotis et al., 2002, 169) and World Bank experts (2003, 70) advised the government to bring about significant changes in the stagnated research system through international standards in research evaluation and the promotion of international cooperation.

This advice was not lost on the Lithuanian government. One civil servant could still recall the verdict of EU-commissioned consultants: "The expert from Coopers and Lybrand told us, 'Listen, annually, from all over Lithuania, you make three hundred articles [in ISI journals], and the rest—somewhere else.'" The civil servant added, "Obviously, we wanted to get more of those ISI articles." Similarly, one politician stated, "After the World Bank indicated insufficient outputs and improvements needed, we immediately submitted their recommendations to the government for implementation."

2.3.3. Pressure to comply with international standards of excellence

From interaction with EU-commissioned and Norwegian experts, Lithuanian policymakers learned that their national outputs were insufficient. Politicians explained that "we needed those ISI papers because the world was already taking data from the Institute for Scientific Information and looking at articles only in those journals." Meanwhile, civil servants said they constantly monitored ISI indicators and reported to policymakers because "everyone was unhappy with national achievements." One of the civil servants added, "the country's results were miserable," and both pointed to the EU report Key Figures 2001: Towards a European Research Area (European Commission 2001). This report does not mention Lithuania but analyses national performance of EU member states using the number of ISI papers among other indicators.

To inform academia's approach to improving Lithuania's standing in the EU, the Lithuanian Academy of Sciences prepared a white paper that served as a basis for the Long-Term Research and Experimental Development Strategy, officially approved by the government in 2003. The white paper deemed it "necessary to pay more attention to the coordination of the country's R&D policy with the EU" as "Lithuania is lagging behind its neighbours" (Lithuanian Science and Technology, 2002, 97). The paper most likely drew on the World Bank report stating that "the number of articles published in scientific periodicals per researcher in highly developed countries usually comes to 0.5 a year. According to data available for 2000, this indicator in Lithuania was as low as 0.05" (World Bank, 2003, 64).

The dynamics between Lithuanian science policymakers and foreign experts were consequential for subsequent reforms. Through their interaction with these experts, Lithuanian policymakers knew they must confront the insufficient internationalisation of the national

research system and the lack of developments in research assessment. The white paper confirms their aim: "the internationalisation problem in Lithuania should be transferred from the level of institutions or the Department of Science and Higher Education to the state level" (2002, 97). A civil servant shared impressions of interacting with foreign experts: "At all levels, national or institutional, eighty per cent of the research assessment value is self-assessment ... what we always did ... not someone from outside coming in and saying what to do." The foreign experts reflected that "it is a strength of the Lithuanian system that policymakers are ready to acknowledge weaknesses in their system and consider a change" (Edler et al. 2007, 6). At that time, the processes and actors involved in Lithuanian policymaking corresponded to what was later deemed as the "OECD model of science policymaking" (Henriques and Larédo 2013).

2.3.4. Attempts to shape national policies by borrowing foreign practices

Interviewed politicians and civil servants said they explored research assessment practices by visiting Western countries to acquire experience and learn informally how research assessment was performed there. This close collaboration with peers in Western countries shaped the national research assessment system and set its direction. Subsequently, Lithuanian policymakers predominantly opted for quantitative measures to assess institutions and researchers. This development arose for three principal reasons. First, because of the small size of the Lithuanian research community, finding unbiased experts for qualitative research assessment seemed impossible after the first attempt (Daujotis et al., 2002, 179), a problem confirmed by the interviewed politicians. Second, Lithuania lacked research outputs in English, especially "internationally recognised academic works." According to the civil servant's reflections, "the country looked sad, and we wanted to encourage them not to be lazy but to publish in ISI journals." Third, Lithuania "had no research assessment culture at all, so quantitative measures seemed the only possible starting point," as another civil servant observed.

The political orientation towards quantitative measures and Western journals began with the awarding of scientific degrees and academic titles, which now required at least fifteen scientific papers published in so-called recognised scientific outlets. These covered three categories of publications: (1) articles in foreign peer-reviewed journals with prominent researchers in the relevant field on their editorial boards; (2) articles in proceedings of conferences organised by international scientific societies; and (3) articles in journals included in the National Journals List. One politician recalled that institutions themselves suggested that research papers should be published in "meaningful outlets." Meanwhile, several civil servants seconded, "researchers should get used to publishing their papers in typical peer-reviewed journals read by the broader scientific community, not only our compatriots."

In parallel with quantitative research assessment for individual researchers (*Minimum Qualification Requirements*), in 2005 a metrics-based system—the *Performance-Based Funding System* (PBFS)—was announced for the distribution of state funding to institutions. From the beginning, research papers, patents, and applied research activities were deemed eligible outputs. Since then, state funding has always been distributed using complex formulas

and calculations. Several civil servants agreed that these calculations can be challenging to understand, but they were sure that "funding should be distributed honestly." The formulas used in the PBFS guaranteed that papers in ISI journals earned the largest share of state funding for institutions.

Over the first decade after the country's independence was regained, Lithuania developed two national quantitative research assessment systems where ISI papers became core research outputs. This happened because all interviewed politicians and civil servants agreed that "since science is international ... assessment involving global publishers, editors, and databases is more reliable than national ones—simply a matter of credibility." Policymakers choosing journal papers as the core of their quantitative measures thus became dependent on journal publishers and databases driven by goals of their own.

The expert dynamic discussed above is further intertwined with a second dynamic involving as many as three parties.

2.4. The database dynamic: How policymakers, journal publishers and publication data providers interact

Lithuanian policymakers, recognising a shortage of articles published in ISI journals, sought to transform researchers' publishing practices by constructing a system of quantitative research assessments. This system involved establishing incentives tied to publication in "recognised scientific outlets," primarily ISI journals. As one civil servant explained, "policymakers knew that researchers' publishing habits would not be changed overnight, but incentives always do their work." To implement this system, policymakers introduced and iterated on lists of approved journals, navigating the dynamic landscape of scientific databases with the aim of "bringing researchers closer to European practices." As shown in Figure 3, this process began with the List of National Journals and later evolved to include the National List of Databases, with a growing emphasis on the Web of Science (WoS) databases introduced in 1995.

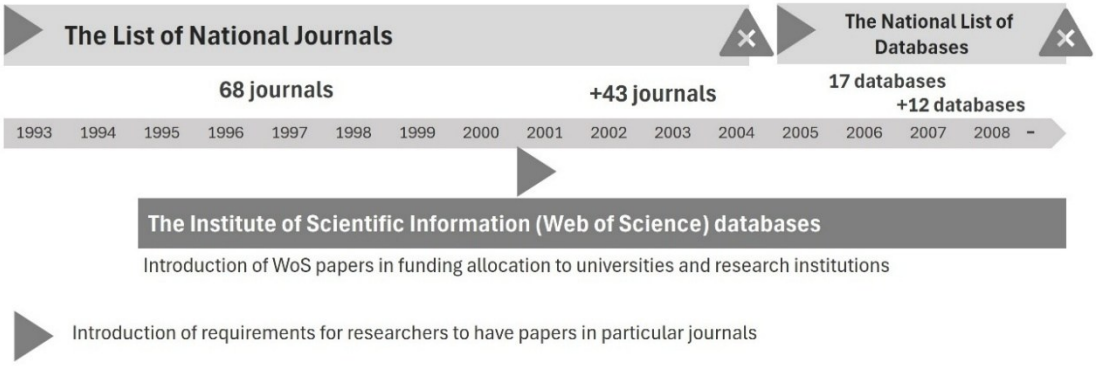

Figure 3. Timeline of major developments in the Lithuanian quantitative research assessment system.

In this section, we explore how these policy decisions, along with the actions of journal publishers and database providers, shaped the trajectory of Lithuanian research assessment.

2.4.1. Maintaining the List of National Journals

The List of National Journals was formally launched in 1996 following an external evaluation (Research Council of Norway 1996), though its development began earlier with a 1993 decree emphasising publications in "prestigious Lithuanian and foreign or international journals." After a year, the just-established Research Council of Lithuania started compiling the list of recognised Lithuanian journals.

Immediately, the list faced criticism from scientific elites. Subačius (2001) argued that "national journals would be mediators between the humanities and social sciences and society if policymakers did not force researchers to crowd into a narrow dorm of approved journals." This criticism intensified as freshly launched institutional journals became eligible for research assessment despite a perceived lack of quality, "having no clear aims and scope, no respected editor or scientific value, but intended solely for the institutional purpose of getting more funding points" (Subačius 2003).

Meanwhile, policymakers also encountered challenges in managing the list. The rapidly growing numbers of included journals (from 68 in 1996 to 109 in 2002) fuelled what policymakers deemed a "nightmare of institutions heavily lobbying their journals." Despite this growth and the adoption of strict quality criteria modelled after the Thomson ISI Journal Selection Process (Testa 2003), policymakers remained sceptical of the quality of domestic publications. They referred to a lack of "Western journal peer-review legacy" and the prevalence of personal relationships influencing reviews as key concerns. As one policymaker noted, "in fact, sooner or later, virtually all manuscripts written by Lithuanians are published in one or another domestic journal" (Daujotis et al., 2002, 151), although some policymakers thought that having policies selecting and accepting Lithuanian journals was reasonable (ibid., 83). Several civil servants acknowledged that institutionally published peer-reviewed journals meant securing survival for institutions with deficient research potential and practising Western rules demanded in the List of National Journals.

Policymakers cancelled the List of National Journals after nearly a decade, citing several reasons for their decision. According to one report (MOSTA 2015), they believed this list "encouraged the launching and survival of national journals and discouraged researchers from publishing in international journals." Furthermore, as one politician suggested, "an entrenched habit of Lithuanian researchers primarily publishing domestically, and often in the Lithuanian language, formed a kind of separation from the international community." One civil servant explained why policymakers felt Lithuanian journals were not recognised as impactful by leading international researchers: "Even though they complied with our formal requirements for peer review, editorial board, and authorship, Lithuanian journals remain insignificant on the international scale." In addition to these concerns, Estonian researchers (Lauk and Allik 2018) noted that Lithuanian institutions had "created [their] own cottage industry of scientific journals instead of competing with the rest of the world for publishing in the leading international journals." In response, policymakers introduced the National List of Databases, shifting the responsibility for journal selection to external entities. This shift represented a significant policy change, aiming to redirect researchers towards international publications and English-language journals.

2.4.2. Shifting journal selection responsibilities to databases

A decree introducing the National List of Databases was issued at the end of 2005; its stated goal was "to promote the international dissemination of the results of scientific research carried out in Lithuanian scientific institutions and to enable scientists to publish articles in peer-reviewed and widely recognised scientific journals." The order announced that the National List of Databases would comprise only databases performing a qualitative selection of peer-reviewed journals and indexing the most important internationally recognised journals or conference proceedings; the Research Council was appointed as a proxy to annually review and revise the list.

Initially, the databases included in the National List of Databases covered only a limited number of Lithuanian journals. One politician mentioned that the list of databases was "quite a clever way to encourage scientists to publish abroad and avoid domestic journal lobbying for inclusion." However, a civil servant added that the list also offered opportunities for domestic journals: "Since we haven't separated Lithuanian journals in research evaluation policies, we gave them a chance to go international." As the academics noticed, researchers and institutions were forced to publish abroad, submitting manuscripts to foreign journals, as domestic journals were rarely indexed in the selected databases.

In response, many Lithuanian journals, experiencing a decline in submissions, changed their publishing language from Lithuanian to English to attract foreign authors and improve their chances of inclusion in nationally listed databases. In 2005, only 13 domestic journals were indexed in such databases; a year later, over 60 Lithuanian journals were included in databases recognised by the Research Council (Kraniauskas and Gedutis 2016). As one politician suggested, "We had disdained some domestic journals although they were included in the List of National Journals, but after national outlets fulfilled our strict requirements, they looked respectable for foreign databases."

Despite policymakers' wish to avoid lobbying, the National List of Databases led to a flurry of such activities. Representatives of foreign databases seeking to expand subscriptions joined local institutions clamouring for the addition of databases indexing journals in which those institutions published. A year after its launch, the National List of Databases, initially containing 17 databases, was supplemented with 12 additional databases. Though gratified by the list's launch, policymakers did not achieve the desired result: a jump in the number of articles in widely recognised scientific journals. Civil servants expressed deep dissatisfaction that quantitative research assessments "were flooded with articles in domestic or low-impact foreign journals." Policymakers withdrew the National List of Databases in 2009, when almost twenty Lithuanian journals became WoS-indexed journals.

2.4.3. The Web of Science as source of unintended consequences

In 1995, policymakers began exploring research quality assessment through ISI (later WoS) journal publications. By 2002, a modest growth in Lithuanian articles in the ISI databases could be observed (Daujotis et al., 2002, 86). However, this growth can only partially be attributed to the new incentives. The 1997 transition of Thomson ISI to the online WoS

(Clarivate Analytics 2018), incorporating multiple citation indexes and expanding journal coverage by 21% in 2000 (Testa 2011), played an important role in the increase in Lithuanian WoS publications.

To accelerate WoS paper growth, in 2001, policymakers mandated WoS articles for senior researchers across all disciplines (except Lithuanian philology) in the Minimum Qualification Requirements, with full implementation by 2006. Additional outputs such as co-authored international papers and conference participation were also encouraged. Universities and research institutions had to adopt these requirements within months, though it was left to institutions to determine which outputs would be given priority, subject to the requirements of the law. One politician admitted that "even seeking internationalisation, demanding WoS papers from the humanities and social sciences was probably not a wise decision," but immediately raised a question: "How do we define 'international' for those disciplines?" In addition to WoS papers mandated in the Minimum Qualification Requirements, in the Habilitation Procedure of 2003, policymakers obliged candidates to have at least two WoS papers. This requirement was applied in all disciplines, including the social sciences and humanities. After prolonged and unfruitful discussions, Lithuanian scientific elites responded to the WoS paper requirement by bringing policymakers before the Constitutional Court (see subsection 2.5.3).

The quantitative research assessment rules changed at the same pace as the number of Lithuanian articles in WoS databases grew. As seen in Figure 4, in the decade 1996–2005, the latter number rose from 167 to 935; then, within three years (2006–2008), it soared to 2,003 papers. The first substantial increase occurred in 1998 when Thomson ISI moved online, the second in 2007 when the WoS greatly expanded and almost 30 Lithuanian journals became WoS-indexed (Dagienė and Sandström 2015).

Mass indexing of Lithuanian journals in WoS databases disappointed policymakers, who sought articles in international scientific outlets as opposed to internationally-recognised domestic ones. Indeed, the decline in the number of publications in foreign journals after 2006 (Figure 4) seems to indicate that the incentives created by policymakers were counterproductive. Several politicians mentioned that the WoS expansion came as a great surprise to them; they had absolutely no expectation that "such a prestigious database could index so many worthless journals from every nook and cranny." In 2008, the WoS expansion resulted in nearly half of the Lithuanian WoS papers being published in domestic journals.

In developing quantitative research assessment measures, Lithuanian policymakers relied heavily on journal publishers and databases, with unintended consequences. Higher education institutions launched new peer-reviewed journals and lobbied for their inclusion in the List of National Journals; databases sought their commercial interests by indexing Lithuanian journals.

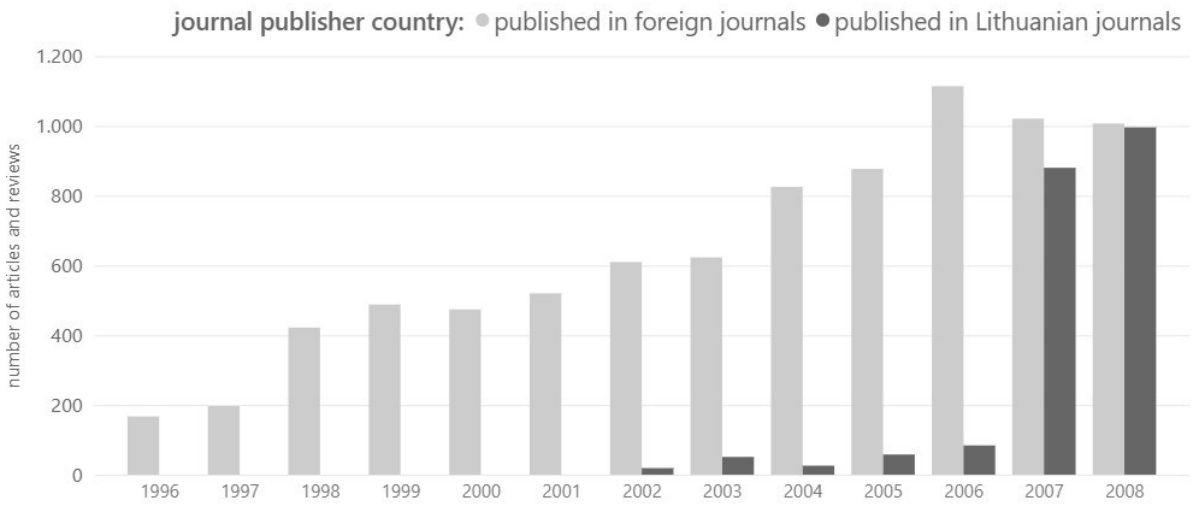

Figure 4. Number of Lithuanian articles and reviews in WoS databases (SCI, SSCI, AHCI) published by Lithuanian and foreign publishers.

With numerous Lithuanian journals becoming WoS-indexed, policymakers were forced to respond to irreversible changes, dropping the second list—the National List of Databases—and relying entirely on WoS indicators of "research quality." Meanwhile, more unintended consequences followed as Lithuanian academics, including scientific elites, mounted stiff resistance to the newly implemented policies.

2.5. Academic dynamics: Researchers challenging the quantitative measures

Policymakers reported consistent dialogue with academia, yet faced significant resistance to new evaluation measures, particularly from the social sciences and humanities (SSH), whose representatives employed lobbying, legal action, and other tactics to oppose the changes. This opposition stemmed from fundamental disagreements among disciplines: the academics and scientific elites from SSH disciplines blamed physicists and chemists for creating systemic inconsistencies exacerbated by unrealistically strict qualification requirements. The metrics-based assessment policies sparked heated debate within Lithuanian academia, with many questioning the validity of the evaluation tools used by policymakers to improve Lithuania's standing in the WoS.

2.5.1. Rising tensions among disciplines

One of the measures aimed at increasing the number of WoS outputs—Minimum Qualification Requirements—triggered a strong response from the SSH community. Despite intense discussion and publications in mass media in the years 1996–2000, compulsory requirements for WoS papers were introduced by law in 2001; in all disciplines, candidates seeking the highest academic positions were obliged to have at least one article in a WoS journal (out of 15 mandated peer-reviewed papers). According to interviewed researchers, at the time of the introduction of the requirements, only one of the almost twenty-five researchers in the humanities who already held the rank of Doctor Habilitatus met the new requirements. Lithuanian researchers publicly accused policymakers of incompetence (Subačius 2001;

Zavadskas 2001). Prominent Lithuanian philosopher and sociologist Zenonas Norkus (2001) even proposed a few Fuller-inspired suggestions for transforming the Lithuanian science system, expanding on controversies that arose a few years prior in domestic magazines for intellectuals in 1998–1999. SSH scholars sustained public pressure into the early 2000s, believing it could sway politicians.

The academics expressed great dissatisfaction because "physicists and chemists took the lead in transforming the Lithuanian science system" and "directly and quite mechanically laid down criteria of the natural sciences to evaluate outputs produced by scientists in humanities and social sciences." Such strict requirements ignited continuing debate over bibliometric measures. As the scientific elites from SSH concluded, their opposition efforts at that time did not yield tangible results, for which they blamed policymakers from the natural sciences. They wondered whether, "by mandating WoS papers, [those policymakers] expected humanities scholars to start writing in English and publishing in international peer-reviewed journals? Everyone agreed that this was wholly inappropriate."

Between 1996 and 2008, the most politically influential scientists were researchers holding degrees in physics or chemistry granted by the largest Lithuanian university. It is therefore perhaps unsurprising that some policymakers indicated that "the natural sciences never grumbled because they always produce work of a high standard." According to the academics in SSH, "they [natural sciences] have had ISI papers since the Soviet era, whereas we [social sciences and humanities] started from zero." Our interviews revealed that in the early 2000s, politicians genuinely believed it was enough for SSH researchers "to work harder to get articles published in ISI journals." Some policymakers passionately insisted that "we hoped to receive more profound strategy or expert advice from SSH representatives on [research assessment in their disciplines], but they didn't even understand what we wanted or sought." Others felt that "everyone in SSH lives in a bubble of their discipline," and in this situation, "those in the humanities, jostling for the front positions, were brighter than [those in the] social sciences," but "actually SSH [scholars] are eternally dissatisfied."

At the same time, interviewed civil servants and politicians with a natural sciences background admitted that they always had a strong opinion about how research should be assessed: "Sometimes, we felt perplexed, especially when [SSH scientific elites and academics] turned us away [from mandating WoS papers], but this was not always bad." Indeed, the SSH community eventually turned the tide by bringing the matter before the Constitutional Court (see subsection 2.5.3), though they also used a variety of other tactics to oppose quantitative research assessment.

2.5.2. Scientific elites as powerful forces in policymaking

Policymakers faced significant institutional resistance when implementing minimum qualification requirements and performance-based assessment for institutions. Research institutions employed various tactics, including establishing their own journals, sponsoring public opinion campaigns, and even leveraging personal connections with prominent politicians to undermine these reforms. As one politician noted, academics acting as representatives of intermediary organisations (the Research Council, the Conference of

University Rectors, the Academy of Sciences, etc.) sometimes enlisted the help of prime ministers or members of Parliament to intervene on their behalf.

Policymakers countered this lobbying with recommendations from foreign experts and commissioned studies, attributing resistance to both cultural factors and "pragmatic concerns over funding." These ongoing debates and political pressure ultimately led to some concessions, such as expanding eligible publication types for SSH research and amending minimum qualification requirements.

Despite these compromises, disagreements persisted. In the 2005 amendment to the minimum qualifications, the mandatory WoS publications for SSH researchers seeking professorship were removed, but WoS publications were still required in the Habilitation Procedure—a prerequisite for a professorship. This fuelled continued manoeuvring by the academics and scientific elites, leveraging their political connections to navigate the complex requirements.

The legislation and grey literature show the most influential intermediary organisations during the period 1996–2008. For example, according to the Law on Science and Studies (wording of 11 June 2002) the government shall establish the Habilitation Procedure considering the proposals of the Research Council, the Conference of Lithuanian University Rectors, the Conference of Directors of the State Scientific Institutes of Lithuania, and the Council of Higher Education. Other sources reporting debates on research assessment reveal more organisations involved: the Lithuanian Academy of Sciences, the Lithuanian Scientific Society, and the currently dissolved Conference of Chairmen of Councils of Higher Education Institutions of Lithuania. These powerful entities often stymied policymakers' attempts to reform the system, leading to a stalemate in some cases.

According to Želvys (2003), state authorities were "not strong enough" to overcome the academic community's resistance to reforms aimed at reducing its autonomy. One policymaker thought that the strongest resistance they faced was from "those who penetrated deep into the top level of academia obstructing progress"; a civil servant suggested that established professors and researchers who had published only in Russian resented the idea that their younger colleagues proficient in English would soon publish internationally, become professors, and take over leading roles in academia. Ultimately, the conflict culminated in a Constitutional Court case brought by the academics and scientific elites, seen by some as a desperate attempt to maintain the status quo.

2.5.3. Constitutional Court case and policy aftermath

In the early 2000s, Lithuanian citizens lacked the right to directly petition the Constitutional Court regarding alleged violations of their constitutional rights or freedoms. For this reason, the academics and scientific elites had to rely on high-ranking officials, such as the President of Lithuania or members of Parliament, to bring their concerns before the Court. They convinced the President that the requirements imposed by policymakers threatened their constitutional rights, and the President represented them in challenging the constitutionality of the government's mandates (Constitutional Court 2007). As seen from the Constitutional Court ruling, both the academics and scientific elites argued that the emphasis on international

publications, particularly in the ISI databases, discriminated against Lithuanian-language scholarship and prioritised formal metrics over substantive research quality.

The policymakers defended the government position, stating that the requirements remained in accordance with the law and aligned with international practices, and that they did not breach any constitutional rights. They also highlighted the requirements' intention of enhancing research standards and fostering international recognition of Lithuanian science.

The court ultimately determined that, while the overall structure of the requirements remained constitutional, the specific requirement of two ISI publications in the Habilitation Procedure was excessively restrictive and disproportionate for SSH researchers (Constitutional Court 2007, 2008). The 2007 ruling marked a significant victory for the SSH community, highlighting the power of legal challenges and the importance of considering disciplinary differences in research assessment. This legal challenge led to the removal of the requirement of WoS publications for SSH researchers for nearly a decade and the eventual elimination of both the Doctor Habilitatus degree and the Habilitation Procedure, a key point of contention.

This case also underscored the significant influence that scientific elites through their institutions and intermediary organisations (such as the Research Council) wielded over science policy decisions in Lithuania. In the end, the Court's ruling reaffirmed the universities' autonomy to establish their own requirements while acknowledging the importance of a balanced research evaluation approach that accounted for both national and international contexts. The Court's focus on the Lithuanian language in academic publications aimed to safeguard and advance national scientific discourse.

The interviewees reflected on the case as a learning experience about academic dynamics and policymaking. One politician reflected that "the assessment dilemma had two axes. On one axis were international and Lithuanian publications, and on another were quantitative and qualitative evaluations." A civil servant ironically likened the situation to past experiences with Russia, saying "we wanted the best, but it turned out as always" and adding that they were "beaten on all sides but learned very much" while underscoring the difficulties of navigating competing interests in science policy reform.

The Constitutional Court further highlighted the complex interplay between quantitative metrics and qualitative evaluations in research assessment, as well as the challenges of achieving consensus in research policy. Notably, even before the well-known San Francisco Declaration on Research Assessment (DORA 2012) and Leiden Manifesto (Hicks et al. 2015), the 2007 ruling concluded that requirements such as a minimum number of publications in internationally recognised journals can be important criteria in evaluating a scientist's qualifications, but do not always reflect the true value and significance of a scientist's work. According to the Court interpretation,

> *[S]uch requirements may not be made absolute, since the mere fact that scientific works are not published in publications that are reviewed in the international databases does not mean in itself that these scientific works are not important: the importance of scientific works should be assessed not only according to the fact that they are published in scientific publications that are reviewed in various*

> *international databases, but, first of all, according to their novelty, original ideas, fundamentality, impact upon formation of new spheres and/or subject areas of scientific research, etc., but not according to the said formal criterion only.*
>
> *(Constitutional Court, 2008)*

2.6. Discussion and conclusions

In this paper, we elucidated the intricate interplay of actors and factors that were important in the development of research assessment policy in Lithuania in the period 1996–2008. This encompassed multiple levels of governmental, institutional, and individual action; diverse stakeholders, from international experts and science policymakers to academic administrators and researchers; and multifaceted issues including publication outputs, journal quality, and quantitative indicators. More specifically, our empirical findings offer detailed insights into a range of policy dynamics through which the quantitative assessment of researchers and institutions developed over the course of a twelve-year period. First, we showed the expert dynamic at play at the beginning of quantitative assessment practices. Lithuanian science policymakers interacted with a range of foreign experts to develop a domestic policy aiming to turn a Soviet-oriented science system into a more internationally-oriented one. Second, we demonstrated how the newfound policy drive for internationalisation in the late 1990s became entangled with a database dynamic that partly undermined policymakers' efforts. Finally, we explored how researchers began to push back on quantitative assessment in an academic dynamic that did not leave science policies untouched.

Reflecting on the Lithuanian case, the tensions arising from adopting dominant international practices in a small, emergent higher education and research system are evident. In their desire to integrate research from this transitional country into the global scientific community, policymakers prioritised emulating seemingly successful models at the expense of local requirements and disciplinary differences. This resulted in the imposition of international publication metrics as the primary measure of academic success across all disciplines, favouring practices prevalent in the natural sciences. Furthermore, policymakers proved resistant to acknowledging the concerns raised by scholars in the humanities and social sciences regarding the inappropriateness of these metrics for their fields. This intransigence led to a Constitutional Court case, which highlighted the tension between the push for internationalisation and the need to recognise local scholarly practices and languages.

For countries in comparable situations, the Lithuanian experience emphasises the need for a nuanced approach—one that acknowledges the value of international collaboration and benchmarking but also prioritises domestic research needs and avoids a one-size-fits-all adoption of foreign models. This involves careful consideration of disciplinary differences, existing research capacity, and potential unintended consequences of incentivising specific metrics. The Lithuanian case underscores that successful integration into the global research landscape can be achieved while preserving national research identities and priorities, but it requires continuous dialogue, policy adjustments, and a critical evaluation of the impact of adopted practices on local research communities.

The three multi-actor policy dynamics that we studied—the expert dynamic, the database dynamic, and the academic dynamic—offer a perspective that goes beyond the perspectives traditionally taken in various subfields of research on research, in particular scientometrics, science policy literature, and sociology of science.

As mentioned in the introduction, the scientometrics literature is strong in methodological discussions of indicators but is relatively silent on their place in policymaking (van den Besselaar et al. 2012; Kehm and Teichler 2007; Robinson-Garcia and Ràfols 2020). Our policy dynamics perspective revealed, first, that research assessment experts were themselves a formative influence in the emergence of indicator-based assessment in the Lithuanian science system. The reports by international organisations that policymakers commissioned relied solely on Web of Science (WoS) data for benchmarking the overall performance of national science systems. The pressure to comply with international standards of excellence—and the desire for EU and OECD integration —led to a narrow focus on increasing WoS publications. Interestingly, these research assessment experts often come from the scientometric community broadly conceived. For scientometricians working on quantitative indicators of internationalisation, our study offers two important insights. First, given their role in international organisations that influence national policymaking, they should examine more critically their own contribution to narrow definitions of academic "excellence." Second—and a reminder not to over-rely on expert power—our research showed how subsequent changes in the quantitative assessment of academic performance are less a result of methodological debates in the scientometric community than an ad hoc response to dynamic changes in the behaviour of other actor groups. Our results could help scientometricians to make sense of the legitimate concerns of researchers about the narrowness of performance indicators and to include these concerns in more open and nuanced ways of assessing academic performance.

In science policy literature, there is an economics-infused tradition of understanding higher education in terms of "delegating" a certain task from one actor group (government as principal) to another (researcher as agent) (Borrás and Edquist 2013; Braun 2003; Potì and Reale 2007; Rip and Meulen 1996). Our research showed that, in relying heavily on providers of publication data, science policymakers faced unintended consequences for the quantified "task" they sought to delegate to the academic community. Our study of the database dynamic revealed two key issues. First, we noted excessive publication in institutional journals following the introduction of special journal lists. By linking research funding to scientific journal articles, policymakers inadvertently incentivised a rapid increase in publications. However, as these policymakers primarily hailed from the natural sciences—physics and chemistry—and published internationally themselves, they failed to anticipate the proliferation of domestic institutional journals and the subsequent challenge of ensuring quality and maintaining rigorous standards across growing numbers of journals. The introduction of the List of National Journals further fuelled institutions' determination to have their journals included, leading to intense lobbying efforts. Second, unforeseen challenges arose from the reliance on WoS as the sole arbiter of "top international" journals. The inclusion of domestic Lithuanian journals in WoS and other databases, driven by subscription revenue

motives, complicated matters for policymakers. Inadvertently, they thereby delegated the responsibility of selecting "top international" journals to these commercial entities and underestimated the possibility that these entities could also opt for less rigorous inclusion criteria. These findings demonstrate the substantial influence of academic institutions and data providers on (re)defining the task at hand. Instead of a relatively straightforward act of "delegation" by one actor group to another, policymakers were caught up in a dynamic with institutions and data providers in which what counts as the "task" was itself at stake.

Sociologists of science, finally, examine research systems as state- and employer-dominated with a focus on state agencies shaping policies, funding research, and driving university changes (Whitley and Gläser 2014; Whitley et al. 2010). This can give a unidirectional character to their approach—as in the influence of science governance arrangements on the production of knowledge—to the detriment of more dynamic multi-actor perspectives. The latter is exactly what our analysis sought to offer. Lithuanian policymakers first promoted the integration of researchers into the global science community by collaborating with foreign experts and incorporating their suggestions, thus validating the significance of international publication metrics. However, their overconfidence in these metrics led to conflicts, stemming from a limited understanding of disciplinary differences and the needs of the SSH community. Despite numerous publications and meetings detailing both sides' positions, no agreement was reached. Regardless of the ongoing debate, policymakers imposed stringent requirements while disregarding field-specific norms and values. This conflict culminated in a Constitutional Court case where the SSH community challenged the unrealistic publication requirements. Initially seen as more or less passive recipients of science policy, researchers steadily counteracted and significantly shaped quantitative research assessment policies. Through public criticism, lobbying, and even legal challenges, they showed their ability to influence policy outcomes. Notably, the Constitutional Court ruled in favour of SSH researchers, underscoring the importance of considering divergent scholarly practices and domestic values in research assessment. However, these actions and outcomes also led to a deep divide between SSH and natural-sciences researchers.

We hope that our Lithuanian case study offers valuable insights for ongoing debates on research assessment reforms, such as those happening in the context of reform movements like the Coalition for Advancing Research Assessment (CoARA). Our case study underscores the significance of considering diverse interests, power dynamics, national and international perspectives, and potential unintended consequences in policymaking. Dialogue and collaboration are crucial for responsible research assessment policies.

Chapter 3.
Incentivising, excluding, and enduring: The policy dynamics of quantitative research assessment in Lithuania

This chapter is based on:
Dagienė, E., Larivière, V, Waltman, L., & Dix, G. (2024). Incentivising, excluding, and enduring: The policy dynamics of quantitative research assessment in Lithuania. *SocArXiv*.
https://doi.org/10.31235/osf.io/9yq38

Author contributions:
Conceptualisation: ED, GD, LW, VL.
Investigation: ED, GD, LW, VL.
Supervision – GD, LW, VL.
Writing – original draft: ED.
Writing – review & editing: GD, LW, VL.

3.1. Introduction

Performance-based funding systems (PBFSs) aim to enhance research quality and accountability by linking funding to demonstrable, and often quantifiable, research performance. Discussions around performance-based funding emerged in the late 1990s (Anderson et al., 1996; de Boer et al., 2015; Gläser et al., 2002), and driven by global trends towards accountability and new public management ideologies, many countries introduced national PBFSs (Hicks, 2012; OECD, 2010), pioneered by the UK (Barker, 2007) and Australia (Taylor, 2001). By 2015, sixteen EU countries had implemented a PBFS, applying three different assessment approaches: 'limited PBFS', 'quantitative formula with bibliometric assessment', and 'peer review' (Zacharewicz et al., 2019). The growing global interest in PBFSs is further emphasised by a review of over 350 papers on institutional performance-based research evaluation in 37 countries (Thomas et al., 2020). This review also summarises limitations of the PBFS literature, such as the overreliance on self-reported data at the institutional level, limiting the ability to attribute changes directly to the macro level of PBFSs and to understand broader systemic effects.

Additionally, the literature on PBFSs often overlooks the nuances and diverse approaches to PBFS implementation in smaller countries. The Lithuanian PBFS is an example, as it is frequently misclassified as relying solely on peer review assessments (Sivertsen, 2017). This misclassification arises from a lack of in-depth understanding of the Lithuanian system, which primarily relies on a quantitative formula with bibliometric assessment, even though it also incorporates expert panels. The role of these expert panels is often overemphasised, leading to an inaccurate categorisation of the Lithuanian PBFS. In practice, the main role of the panels is to recommend changes to PBFS models or instruments in response to questionable practices, such as excessive publication in institutional journals or artificial inflation of Journal Impact Factor (JIF) scores. The panels have no role in directly evaluating individual research outputs.

The misclassification of Lithuania does not stand alone. With some notable exceptions (Kulczycki et al., 2017, Good et al., 2015, Stöckelová, 2012) there is a predominant focus on Western European countries in the literature on public science systems and the place of policy dynamics therein. In this paper, we present a detailed study of the development of Lithuanian PBFS policies. Our study aims to contribute to a more in-depth understanding of the roles various stakeholders play in shaping national PBFSs. We adopt a multi-level, multi-actor, and multi-issue framework (Chou et al., 2017) to analyse the interactions between different stakeholders (R. Whitley et al., 2010) and to examine their decision-making processes.

Figure 1 illustrates the multi-level governance, the multi-actor involvement, and the multi-issue interdependence in the development of Lithuanian PBFS policies. In this paper, we first identify and characterise the key actors shaping the evolution of the Lithuanian PBFS and, then, we show the implications of their interactions for policy outcomes. Specifically, we analyse the interactions among state institutions, higher education authorities, politicians, civil servants, scientific elites, and non-state actors, exploring how their diverse interests and perspectives influenced the PBFS landscape. Second, we examine how Lithuanian policymakers navigated the tension between international aspirations and domestic realities while shaping the development of the PBFS and addressing unintended consequences of their

policy decisions. Finally, we elucidate how Lithuanian universities and individual researchers adapted their publication strategies in response to the evolving PBFS landscape and we explore the implications of these adaptations for the research outputs produced in Lithuania.

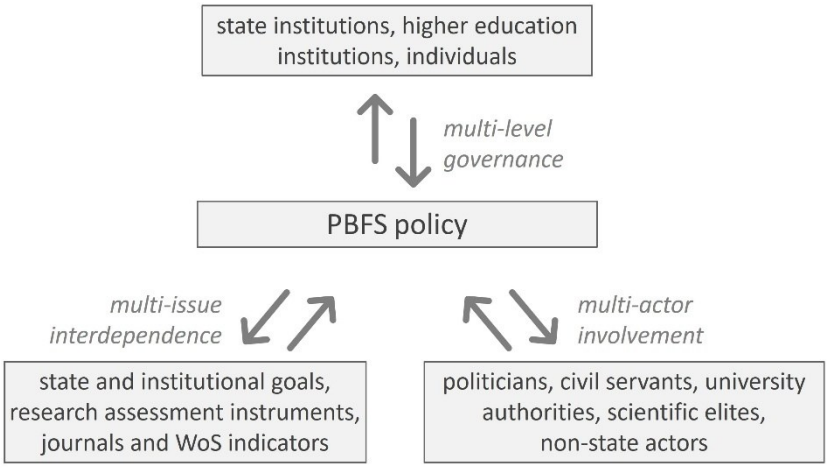

Figure 1. Development of Lithuanian PBFS policies through the lens of a multi-level, multi-actor, and multi-issue framework.

By examining research assessment policies, shifts in performance indicators, and the responses of various actors within the Lithuanian PBFS, this study addresses the key questions of who shapes the PBFS, how policymakers navigate competing pressures, and how universities and researchers adapt their strategies. Our work aims to illuminate the complex interplay of actors and strategies, offering insights into how PBFS policies evolve and how they impact research practices and outcomes in the context of a smaller country. The present study complements a previous study on multi-actor policy dynamics (Dagienė et al., 2024) in which we explored the motivations behind the adoption of a quantitative approach to research assessment in Lithuania, including the influence of journal publishers and the Web of Science database.

3.2. Literature review

Performance-based funding, which allocates resources based on evaluations of research outputs, has become a prevalent policy tool in national scientific systems. Many countries have implemented national PBFSs, which has fostered research regarding their efficacy, unintended consequences, and the roles various actors play in shaping research practices. This literature review first explores the diverse models, goals, and policy dynamics associated with national PBFSs and then turns its focus to the specific context of Lithuania.

3.2.1. Models, goals, and indicators in national PBFSs

National PBFSs, used to allocate research funding based on performance, are structured around various models and goals, leading to their continuous evolution. PBFSs can be categorised as *ex-ante* (before research activities) or *ex-post* (after research activities), and they may employ bibliometrics (quantitative formulas using publication metrics) or peer

review (assessments by experts) as evaluation methods (Geuna & Martin, 2003). Bibliometric models are often favoured for organisation-wide evaluations (Good et al., 2015; Haugen & Sandnes, 2016), while peer review is common for department- or group-level assessments, as seen in the UK and Italy (Martin, 2011; McNay, 2003; Rebora & Turri, 2013).

Despite the ongoing debate surrounding evaluation methods, the underlying logic of PBFSs remains consistent across different implementations. The choice between these models is debated, with no consensus on superiority (de Rijcke et al., 2016; Sivertsen, 2017; Traag & Waltman, 2019). Consequently, some nations combine both, allocating funding based on a mixture of bibliometrics and peer review (de Boer et al., 2015; Kulczycki et al., 2017; Nelhans, 2022). Efforts to integrate bibliometrics into peer review suggest that peer review informed by bibliometric indicators may be optimal (Franceschet & Costantini, 2011; Wouters et al., 2015).

The underlying logic of PBFSs includes rewarding research performance, redistributing resources for efficiency, and improving management for informed change (Gläser et al., 2002; Gläser & Laudel, 2016; Martin, 2011). This has led to strategic shifts within universities, focusing on optimising research portfolios and aligning with funding priorities (Whitley, 2008). In response to these pressures, universities have adopted various strategies within the framework of PBFSs. To succeed in their national PBFS, universities often implement their own performance-based funding models internally to redistribute resources to researchers or departments (Aagaard, 2015; Aagaard et al., 2015; Mouritzen & Opstrup, 2020; Rowlands & Wright, 2021; Woelert, 2021). Even without a national PBFS, universities and departments in the Netherlands apply their own performance-based funding allocation to research groups (Dix et al., 2020; Leišyte et al., 2008).

Fourteen countries had adopted a national ex-post PBFS by 2010, using institutional research outputs for state funding allocation (Hicks, 2012). The goals and models of PBFSs have evolved over time. Initially emphasising quantity of outputs, many national systems have transitioned towards prioritising research excellence and impact (Hammarfelt et al., 2016; Moore et al., 2017). For example, in Poland, the PBFS focus moved from ‘strengthening scientific performance’ to ‘identifying various aspects of excellence’ (Kulczycki et al., 2017).

The indicators used in PBFSs have also evolved. Many national PBFSs, including those of Czechia (Good et al., 2015), Poland (Kulczycki et al., 2017), and Slovenia (Mali et al., 2016), initially relied heavily on the JIF for funding allocation, favouring publications in journals indexed in Web of Science (WoS). Later, they also incorporated other databases such as Scopus and ERIH, though with lower weights.

Beyond database metrics, numerous countries have developed national journal ranking systems. Among those, the Publication Indicator in Norway (Aagaard, 2015; Bloch & Schneider, 2016; Haugen & Sandnes, 2016; Sivertsen, 2018) has had international impact and was subsequently adopted (and adapted) by Finland and Flanders (Pölönen et al., 2020) as well as Denmark (Deutz et al., 2021; Pedersen, 2010) and Sweden (Hammarfelt & Haddow, 2018; Nelhans, 2022). The Excellence in Research for Australia initiative employed a journal ranking system maintained by the Research Council; while influential, it faced criticism for

such issues as disciplinary bias and lack of correlation with established metrics (Vanclay, 2011). Similarly, the Polish 2015 journal ranking system used various metrics but emphasised influence of expert evaluation (Kulczycki & Rozkosz, 2017). Meanwhile, Serbia has also created its own citation index (Šipka, 2005).

Studying the development of journal ranking systems, Pontille and Torny (2010) highlighted challenges in defining quality, balancing disciplinary diversity, and preventing misuse. Despite these criticisms, journal rankings and indicators such as JIF persist, and can be associated with manipulation attempts. Hickman et al. (2019) argued that such manipulation could be illegal due to misrepresentation of research impact. Meanwhile, Butler and Spoelstra (2020) criticised the "publication game" metaphor, suggesting it masks a deeper "lusory attitude" driven by institutional pressures that harm research quality.

These complex interactions emphasise the need to consider policy instruments, actors, and governance levels when analysing unintended consequences and strategic responses within PBFSs (Flanagan et al., 2011).

3.2.2. Dynamics between actor groups in PBFSs

While many theoretical frameworks have been developed over recent decades (van der Heijden et al., 2021), the causal-mechanism movement is not generally embraced in policy-process theorising. Science policy literature have proposed delegation models in research funding as potential solutions to the paradox inherent in research policies (Braun, 2003; Rip & van der Meulen, 1996). These models seek to balance the state's desire for control with the need for institutional autonomy and scientific freedom (Rip & van der Meulen, 1996). Policymaking in the realm of public science systems involves a complex interplay of various actors, each with their own interests and influence on policy outcomes (Weible & Workman, 2022). Research on public science policymaking identifies three ideal types of systems based on the dominant actors: state-dominated, state-delegated, and employer-dominated (R. Whitley et al., 2010).

Within PBFSs, the main actors of the public science system are readily identifiable. *Ministries* (state agencies) set assessment rules and overarching goals for research, listen to signals from the research system, and stimulate bottom-up agenda-building processes (Rip & van der Meulen, 1996). *Universities* (employing organisations) submit research outputs for evaluation and are directly affected by funding allocations (Kivistö & Mathies, 2023). *Scientific elites* are the senior researchers who serve on various expert panels and play a crucial role in shaping research assessment policies and their own behaviour (Waitere et al., 2011; Whitley, 2016). Their influence can sometimes lead to tensions, as senior researchers may also resist changes to PBFSs that they perceive as misaligned with their interests (Nelhans, 2022). This can create a pushback dynamic in which researchers advocate for alternative metrics or evaluation approaches that better reflect their disciplinary values and priorities. Research also highlights the role of *research councils* as intermediaries between the state and scientists (Martin, 2011; Slipersæter et al., 2007; van der Meulen, 2003). They often manage research assessments and can mediate conflicting interests between the government and the research community.

The complex interactions among these formal actors often exhibit multi-actor and multi-level dynamics (Chou et al., 2017). While the multi-level characteristic focuses on the distribution of authority across governance levels, the multi-actor characteristic reflects the heterogeneity of the state and the involvement of more actors influencing the evolution of PBFSs. Here, *professional organisations* of academics can exert influence through collaboration and lobbying (Whitley & Gläser, 2014), while university councils and boards exert indirect influence (Antonowicz et al., 2024; de Boer et al., 2010; Kwiek, 2015).

Beyond these formal actors, *industry* and *civil society* are increasingly involved in shaping science policy (Gläser, 2019; Gläser & Laudel, 2016). Their influence can be seen in the growing emphasis on research impact and societal relevance in many PBFSs. At the micro-level, researchers themselves respond to PBFSs through their publication strategies (Johann et al., 2024) and engagement with accountability mechanisms (Hansen et al., 2019), revealing the effects of PBFSs on individual behaviour.

Understanding this interplay is crucial for comprehending the evolution and impact of PBFSs, as the advocacy and strategic adaptations of the above-mentioned actors significantly influence PBFSs and, consequently, the direction and nature of research activities within a nation.

3.2.3. The Lithuanian PBFS through research assessment reforms and policy dynamics

The literature on policy dynamics within public science systems generally focuses on Western European countries, leaving a gap in understanding the experiences of Eastern European nations transitioning from Soviet-era systems. Lithuania's journey provides valuable insights into this understudied context. Lithuania's deliberate attempt to break away from its Soviet-oriented science system and integrate with the international scientific community represents a significant policy shift. This transformation, in turn, highlights the challenges and opportunities faced by countries undergoing such radical reforms.

The rapid changes in Lithuania's research assessment system, including the introduction and subsequent withdrawal of national journal lists and databases, offer a clear view of the dynamics between different actor groups (e.g., policymakers, universities, researchers). These dynamics, marked by conflict and negotiation, are often less visible in more established systems.

Lithuania's experience resonates with other countries in the region, such as Czechia, Poland, and Slovenia, whose PBFS models and indicators have already been explored in the literature quite extensively. Understanding the Lithuanian case can thus offer valuable insights into the challenges and successes of research assessment reforms in similar contexts.

Following independence, Lithuania's research landscape faced significant challenges (Allik, 2003; Želvys, 2003). Despite the establishment of university autonomy and state-level bureaucratic structures, modern research management practices were slow to develop (Leišytė & Kiznienė, 2006). Assessments in the late 1990s revealed a substantial gap in Lithuanian research output, particularly in English-language publications and those indexed in WoS databases (European Commission, 2001, 2007; Research Council of Norway, 1996; World

Bank, 2003). In response, Lithuania prioritised internationalisation efforts and research assessment reforms to align with global standards (Crăciun & Orosz, 2018; Daujotis et al., 2002; *Lithuanian Science and Technology*, 2002).

The early 2000s saw a heavy reliance on publication indicators, particularly the number of articles in WoS-indexed journals. The focus on WoS articles aimed to increase the internationalisation of Lithuanian research, but it also sparked debate as the social sciences and humanities were poorly represented in WoS (Norkus, 2001; Subačius, 2001). After unfruitful debates, scientific elites brought the government to the Constitutional Court, whose ruling (Constitutional Court, 2007) relaxed strict WoS requirements for these disciplines until 2015.

To address the challenges, Lithuania introduced two policy instruments: the List of National Journals (1993–2004) and the National List of Databases (2005–2009). The former incentivised publishing in peer-reviewed journals but faced criticism for prioritising quantity over quality (Subačius, 2003). The latter aimed to promote international publications but also inadvertently incentivised Lithuanian journals to switch to English and seek inclusion in these databases. These efforts led to a rapid increase in the number of domestic but internationally indexed journals (Kraniauskas & Gedutis, 2016). Policymakers, who initially saw the lists as ways to promote national research, were later concerned about the lack of rigorous peer review (Daujotis et al., 2002) and limited international recognition (MOSTA, 2015). This, coupled with the expansion of WoS and the subsequent dominance of domestic journals in Lithuanian WoS outputs, prompted policymakers to cancel both lists.

Despite all these challenges, Lithuanian research output in WoS-indexed journals increased significantly, demonstrating the impact of policy measures aimed at increased research performance (Chankseliani et al., 2021). However, this growth was not without its drawbacks. Foreign researchers noted quality issues and the emergence of questionable practices in Lithuanian research (Grančay et al., 2017; Lauk & Allik, 2018). These findings echo the experiences of other countries implementing PBFSs, highlighting the potential for unintended consequences when quantitative metrics are prioritised (Elton, 2000; Johann et al., 2024; Taylor, 2001).

The Lithuanian experience underscores the complex and dynamic nature of research assessment reforms. The interplay of policy instruments, institutional actors, and individual researchers, combined with the unique challenges of transitioning from a Soviet-era system, have shaped the evolution of Lithuania's research landscape. The case study presented in this paper serves as a lens through which to examine the broader implications of the quantitative bibliometric model of PBFSs and research assessment policies in post-Soviet and transitioning countries.

3.3. Data and methods

To understand the development, performance and dynamics of the Lithuanian PBFS, this study employs a mixed-methods approach, combining policy analysis, bibliometric analysis, and semi-structured interviews, and supplemented by grey literature identified by interviewees.

Using the data and methods explained below, we sought to gain a comprehensive understanding of the specific case of the Lithuanian PBFS by analysing the intricate relationship between policy, institutional practices, and individual researcher behaviour.

Policy document analysis. PBFS regulations from 2004 to 2024 were obtained from Lithuania's national register TAR (https://www.e-tar.lt/portal/en/index). Examining national PBFS regulations, we traced the evolution of the PBFS framework and identified major shifts in performance indicators and policy instruments, such as maintenance of national journal lists and rejection of journal outputs suspected of artificial citation inflation. The latter policy instrument, allowing expert panels to reject institutional outputs, was selected for in-depth analysis. This choice was due to its potential to illuminate policy dynamics in quantitative research assessment, as it directly affected institutional scores by rejecting suspect publications. To explore the impact of this policy instrument, 'lists of suspended journals' (journals whose articles were rejected, resulting in no points for institutions) were obtained from the Research Council of Lithuania website (https://lmt.lrv.lt/en/science-quality/). These lists consisted of the 156 journals suspended between 2012 and 2019. Since 15 journals were indexed only in Scopus, only 141 journals indexed in WoS are the focus of our study.

Analysis of semi-structured interviews. Fifty-seven semi-structured interviews were conducted with policymakers, civil servants, research administrators, and individual researchers (Figure 2) to gather insights on research evaluation in Lithuania, including the PBFS. Interviews explored stakeholders' expectations regarding research assessment policy instruments, their experiences with implementation, and their perceptions of the research assessment system's strengths and weaknesses. Policymakers were asked to share their experiences developing national research assessment policies, while other stakeholders were asked about their experiences complying with research assessment requirements. Anonymity was assured to encourage candid responses. Interviews were conducted from mid-2019 to mid-2023. Follow-up questions were asked as needed for clarification, and responses were incorporated into the corresponding interview transcripts.

All interviews were audio-recorded, transcribed verbatim, and partially translated. Transcripts were then imported into the Atlas.ti qualitative data analysis software. Through inductive analysis we systematically identified and interpreted patterns of meaning across the interview data, following established qualitative research guidelines (Thomas, 2006). This process allowed for the identification of rich and nuanced insights into the perspectives of stakeholders at all levels, revealing their motivations and challenges as well as their perceptions of the effectiveness of the Lithuanian PBFS.

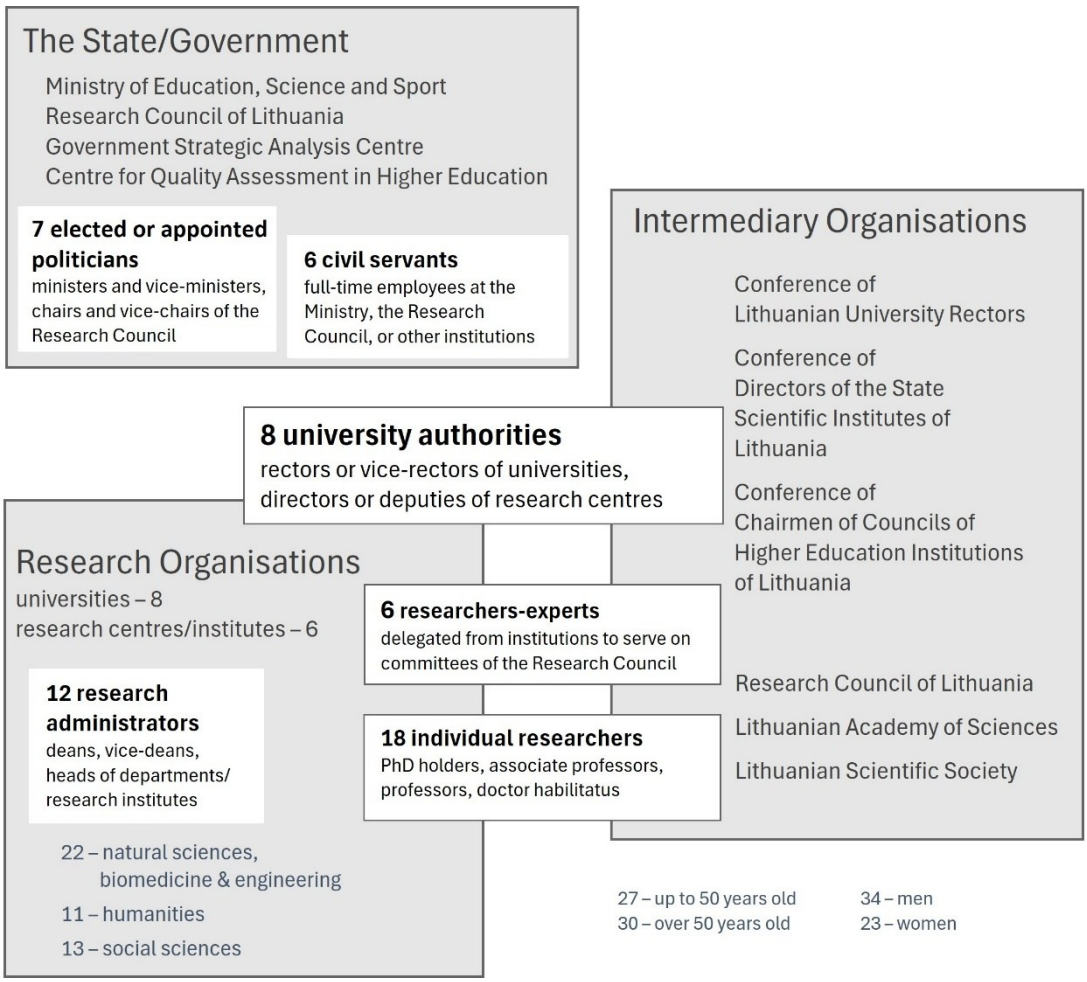

Figure 2. The composition of interviewees and their roles in the Lithuanian research assessment landscape.

Bibliometric analysis. We used the in-house version of the Web of Science (WoS) database maintained by the Centre for Science and Technology Studies (CWTS) at Leiden University, including the following WoS citation indexes: Science Citation Index Expanded, Social Sciences Citation Index, Arts & Humanities Citation Index, and Emerging Sources Citation Index. We analysed all WoS articles and reviews authored by at least one Lithuanian researcher in 2005–2022, as well as those published in 141 journals that were suspended in 2012–2019 and, at that time, were already in WoS citation indexes. We conducted bibliometric analyses at the national, institutional, and individual levels. Data on journals' quartiles (Q1, Q2, Q3, Q4) in their designated WoS categories were obtained from Clarivate's Journal Citation Reports (see subsection 3.5.4). Additional document searches in the WoS user interface identified the publishers of journals used by researchers most affected by the suspension policy. Bibliometric analysis revealed quantitative evidence of the impact of this policy on publication patterns, highlighting shifts in journal choices and potential gaming strategies (see subsection 3.5.2).

3.4. Stakeholders and their decision-making strategies

To understand the dynamic forces shaping Lithuania's PBFS, we first examine the roles and influence of its key players—policymakers, universities, and researchers—dissecting the landscape of this system and drawing insights from research assessment policies, interviews, and grey literature.

Formally, the PBFS operates on an annual cycle. The Ministry of Education, Science, and Sport (*the Ministry*) initiates this cycle by issuing a decree that outlines funding formulas and eligible research outputs. *The universities* then submit their research to the Research Council of Lithuania (*the Council*), which coordinates expert evaluations. Senior researchers (*scientific elites*), serving as experts, assess the submitted outputs against the Ministry's defined indicators. Universities receive results after several months and have the option to appeal through the Council. The final results are then disseminated to the Ministry, the universities, and the public. The following subsections delve into the specific influence of each actor. Figure 3 illustrates the process and the wider network of stakeholders influencing the PBFS.

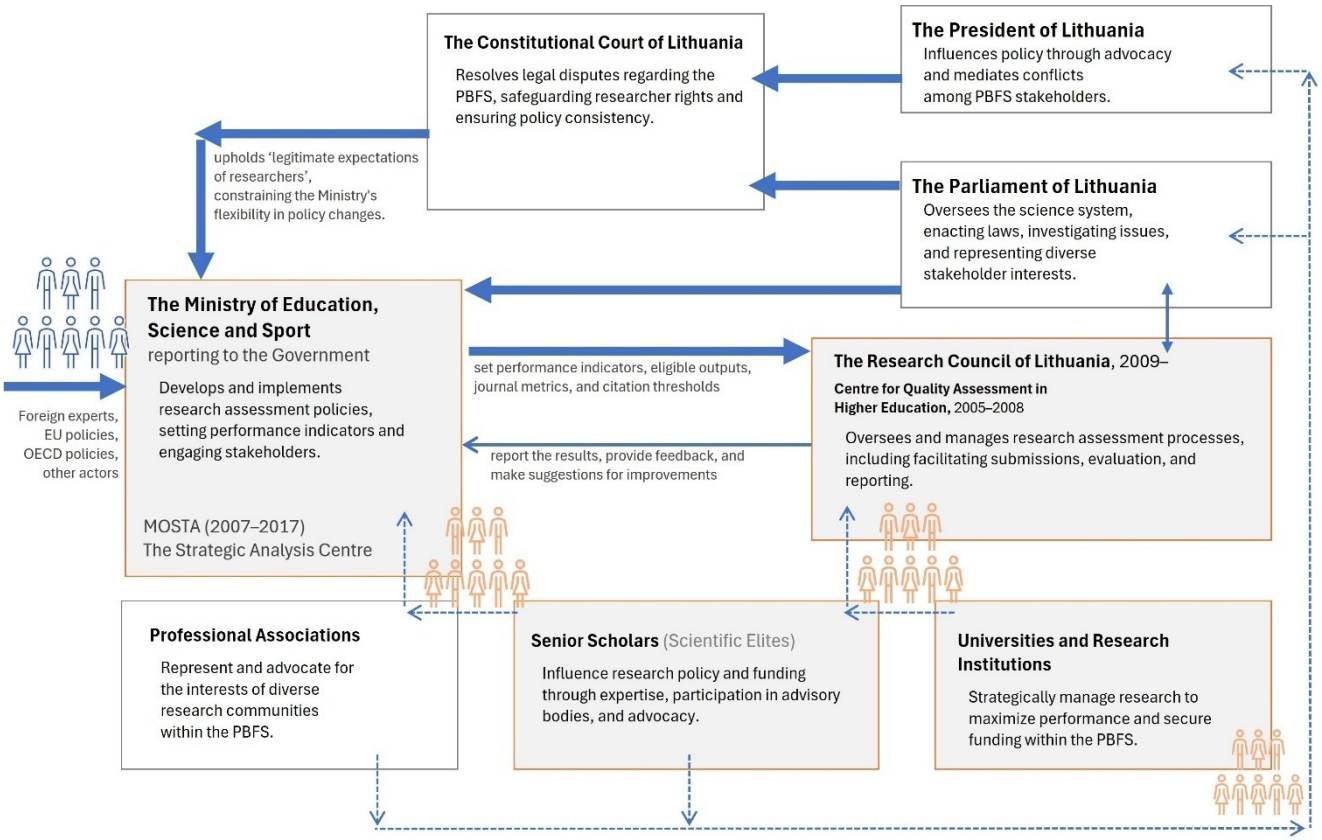

Figure 3. The Lithuanian PBFS in action: A structural map of stakeholders, roles, and decision-making processes.

3.4.1. The Ministry's policy leadership and challenges

The Ministry is the primary policymaker for Lithuania's research and innovation system (Paliokaitė et al., 2018), playing a central role in designing and implementing the PBFS

through its Higher Education, Science, and Technology Department. The Ministry previously housed a higher education monitoring and analysis centre (MOSTA) from 2007 to 2017, which was instrumental in piloting a peer-review model for the PBFS in 2015 (Arnold & Angelis, 2014). However, MOSTA was later reformed and discontinued in 2017, reportedly due to pressure from scientific elites.

The Ministry, as the leader in science policymaking, shapes the PBFS's overall direction by developing policies and translating them into practical measures, defining the specific criteria and metrics used to evaluate research performance and setting standards for quality and impact. The Ministry also outlines eligible research outputs through legal acts, aiming to prioritise high-quality, relevant research, to foster international collaboration, and to incentivise Lithuanian researchers to publish in prestigious journals.

Despite the Ministry's claims of actively engaging stakeholders in refining research assessment, challenges persist. Research administrators at the institutional level report feeling unheard and express dissatisfaction with the Ministry's responsiveness. This aligns with previous research (Paliokaitė et al., 2015) suggesting a lack of effective communication and issue resolution. Interviews with civil servants further confirm these challenges, describing stakeholder engagement as unproductive and often leading to decisions that defer to the Ministry's own priorities.

3.4.2. The Council's implementation and expertise

While primarily an advisory and analytical body, the Council is a key institution in implementing science policy. Its publicly stated aims include increasing the value, efficiency, and impact of science through expert evaluations of scientific performance, administering programs for the development of Lithuanian science, representing Lithuania's interests in science and research at the European Union and international levels, and implementing competitive funding programs for science. The Council's unique blend of expertise and implementation capacity has made it pivotal in the PBFS since 2009.

The Council relies on two groups of experts to assess research: members of its permanent expert committees (delegated by institutions) and invited experts. Ensuring true independence of these experts within Lithuania's small research community is a challenge. Potential biases and conflicts of interest may arise due to these experts' affiliations with Lithuanian institutions. As one interviewed researcher put it, the concept of an 'independent expert' in this context seems paradoxical. Since experts are often affiliated with Lithuanian institutions, they may be inclined to favour decisions that benefit their own institutions, even if indirectly. To increase fairness and minimise bias, expert panels are often composed of senior Lithuanian researchers residing abroad and working for foreign universities.

Despite these concerns, the experts work anonymously to avoid institutional pressure, following the General Rules (Research Council, 2018). These rules outline the types of experts, requirements for becoming an expert, and the principles and procedures governing their work, including remuneration and conflict of interest protocols. The experts assess research outputs based on criteria outlined in ministerial regulations, including publisher or

journal requirements. While pre-calculated scores based on JIFs and journal citation thresholds are provided, experts have the authority to raise concerns and adjust scores if they believe the metrics do not accurately reflect research quality.

3.4.3. Role of universities in shaping PBFS policy

The Universities (higher education and research institutions) actively participate in the Lithuanian PBFS, both responding to its incentives and shaping its outcomes. They strategically select and submit research outputs for evaluation, aiming to maximise recognition and funding. They actively appeal unfavourable assessment decisions—but rarely succeed, as research administrators complained.

To enhance their PBFS performance, universities develop strategies to align their research priorities with assessment criteria and metrics. They create internal incentive systems to reward researchers whose work contributes to securing state funding through the PBFS. Universities directly influence and challenge the PBFS goals by launching peer-reviewed journals to publish their researchers' papers and subsequently submitting these papers for state funding. They also invest in training and resources to support researchers in producing outputs favoured by the PBFS.

University leaders and senior scholars often perceive themselves as possessing unique expertise within the science system, given that only senior researchers can be elected as university rectors or directors of research institutes. This confidence, coupled with their institutional strategic efforts, empowers them to actively engage in collective advocacy at the national level through professional organisations. The Rectors' Conference, in particular, exerts considerable pressure on the Ministry, often complaining against research assessment policies.

The Rectors' Conference simultaneously shapes new policies and resists unfavourable changes, creating tension within the system. This tension stems from confusion among university leaders about who holds ultimate authority over PBFS rules; representatives of some universities blamed the Ministry for bad decisions, while those of other universities blamed the Research Council for the same decisions, so both the Ministry and the Research Council were criticised for perceived incompetence in setting criteria.

3.4.4. Influence of scientific elites and resulting tensions

Senior scholars (the scientific elites), usually individual researchers employed at universities, play a central role in the national PBFS. They are both prolific producers of assessed outputs and members of evaluation committees, highlighting the dynamic interplay between individual researchers and the broader research assessment system. The scientific elites exert significant influence in shaping the PBFS through various avenues:

Leadership and expertise at the Council, which is composed of senior researchers and PhD-holding civil servants and plays a pivotal role in shaping research assessment policies. The involvement of the scientific elites in all layers of the Council ensures their expertise directly informs policy.

Institutional leadership at universities as rectors, vice-rectors, deans, and chairs of influential committees who shape institutional strategies for research production, dissemination, and internal incentive structures.

High-level political engagement, as many chairs of the Committee on Science, Education and Culture at the Lithuanian Parliament (the *Lietuvos Respublikos Seimas*) as well as elected ministers or assigned vice-ministers for research at the Ministry of Education, Science and Sport have come from academia, reflecting the sector's influence. Interviews also revealed that members of the Seimas and Government, often under the influence of the scientific elites, have demanded explanations from civil servants and policymakers regarding specific research assessment instruments; this pressure has sometimes led to resignations of civil servants.

The involvement of *the President of Lithuania* in research assessment policy debates further exemplifies the influence of the scientific elites. For instance, scholars convinced the President to request that *the Constitutional Court* investigate the 2003 requirement mandating that seekers of professorships or Doctor Habilitatus degrees publish in WoS-indexed journals (Constitutional Court, 2007, 2008; Dagienė et al., 2024). Even though this case focused on minimum requirements for researchers, it had a lasting impact on the PBFS performance indicators. After the Court issued it rulings about the feasibility and fairness of minimum requirements for SSH disciplines, the highest funding points for WoS papers in the social sciences and humanities established in the 2006 and 2008 methodologies were removed from the 2009 methodology and subsequent versions until 2015. Interestingly, these highest point value allocations for WoS papers reappeared in the list of eligible outputs in 2015 for research in the social sciences and humanities but have been retained only for the social sciences since 2017. A civil servant attributed this difference to the humanities' stronger lobbying efforts against such requirements.

Repeated legal challenges brought by the scientific elites against the government before the Constitutional Court further complicated the PBFS landscape and led to the establishment of the principle of 'legitimate expectations' in Lithuanian research policymaking. A judge of the Constitutional Court has even noticed the prevalence of academia's disputes brought before the court, requiring the Ministry to maintain consistent and predictable policies. These 'legitimate expectations' lead to a reluctance among civil servants and policymakers to introduce changes, fearing further legal repercussions.

These diverse avenues of engagement showcase the substantial power the scientific elites wield within the PBFS. Their expertise, advocacy, and access to decision-makers enable them to influence research assessment and state funding allocation in Lithuania. The analysis reveals the dominant role of the scientific elites in shaping the PBFS landscape, resulting in tensions between all stakeholders and prompting their reactions.

3.5. Policymakers navigating international aspirations and domestic realities

Behind the complex formulas and indicators of the Lithuanian PBFS lies a narrative of competing interests, national ambition, and the quest for excellence in Lithuanian research (*Lithuanian Science and Technology*, 2002). The evolution of the PBFS reflects an ongoing

dialogue between policymakers striving to align funding with national goals and universities adapting their strategies to maximise their share of public resources. This section delves into the actions and motivations of each stakeholder group, exploring how policymakers navigated international aspirations and domestic realities while universities and researchers adapted to the shifting policy landscape.

At the Ministry and the Council, interviewed civil servants and policymakers demonstrated a thorough understanding of European and global trends in research assessment, ensuring alignment with international best practices while representing the nation's unique interests. The impressive reference lists in the monograph *Lithuanian Science Policy in the European Context* (Daujotis et al., 2002) demonstrate policymakers' deep awareness of prevailing science policymaking when designing and implementing the national PBFS in 2006. This monograph encompasses OECD, UNESCO, and EU recommendations, then-current scientometric research, and various national policies.

3.5.1. Shifting the focus to international publications

In the early 2000s, Lithuanian policymakers found themselves at a crossroads (Dagienė et al., 2024). Even though Lithuanian researchers, like those in many developing countries, often published their findings in local journals (Wagner et al., 2001), it was becoming increasingly clear that publications in WoS-indexed journals were the currency of the international scientific community. This was a currency Lithuania sorely lacked (World Bank, 2003), lagging behind the European Union average in research productivity relative to public investment (European Commission, 2001, 2007; Thorn & Mogensen, 2009).

Aware of this situation, policymakers sought to 'make Lithuanian research better' not only by increasing the quantity of publications, but also by improving their quality and impact. The vision was clear: Lithuanian research would be published in the most prestigious, high-impact journals—a goal explicitly stated in policy documents from 2008 and 2017.

Driven by ambition and a desire for rapid results, policymakers crafted a PBFS incentivising research through direct financial rewards tied to annual quantitative research assessments. The centrepiece of this system was a heavy emphasis on journal publications, particularly those in WoS-indexed journals, which received the highest scores and the most state funding.

3.5.2. Balancing quality, rigour, and unintended consequences

While the intent behind this policy was clear, its implementation and impact raised important questions due to inconsistencies in its application and potential unintended consequences. Policy analysis reveals a dramatic shift in how Lithuania utilised quantitative metrics to incentivise the highest-quality research. Initially, from 2006 until 2009, no other WoS metrics (apart from indexing) were mentioned in research assessment policies: WoS indexing alone was deemed a sufficient marker of quality, hence articles in WoS journals received the highest scores and the most state funding.

Following the implementation of the PBFS in 2005, most Lithuanian WoS outputs were published in international journals. However, starting around 2009, the unexpected inclusion

of numerous Lithuanian journals in the WoS indexes (Figure 4), combined with their predominantly domestic authorship (Dagienė & Sandström, 2015), forced policymakers to reconsider the PBFS metrics.

Moreover, as newly WoS-indexed Lithuanian journals achieved their first JIFs around 2009, with some even reaching the top quartile of their WoS categories, institutions publishing in their institutional journals received increased funding, which some of the interviewed policymakers and civil servants considered unfair. This prompted them to turn to bibliometric indicators such as the JIF and Aggregate Impact Factor (AIF) to differentiate between high- and low-quality journals.

From 2010 onward, policymakers introduced complex citation thresholds based on both JIF and citation patterns, aiming at further refining the quality threshold for research funding eligibility. The PBFS regulations required eligible papers to be published in journals that not only had a JIF higher than 20% of the AIF of their respective WoS categories, but also more than 20% of their citations coming from journals with JIFs exceeding the AIF of their own categories (Maskeliūnas et al., 2015). As most Lithuanian journals did not meet these stringent criteria, universities were ineligible for state funding for publications in these journals after 2010.

Interviews with policymakers and civil servants revealed that these thresholds were based on a combination of empirical analysis of citation patterns and a desire to encourage researchers to publish in internationally recognised journals. One policymaker, citing an analysis of Lithuanian WoS-indexed journals, noted that '...only *Baltic Astronomy* passed this threshold at that time'. Another policymaker echoed this point, mentioning that they had been inspired by the Leiden Ranking's list of core and non-core journals, which then listed only *Baltic Astronomy* as a core journal. As this policymaker said, they ultimately abandoned using this list as it failed to align with their empirical examination of Lithuanian research outputs: '... too few Lithuanian articles have been published in core journals to apply that list'.

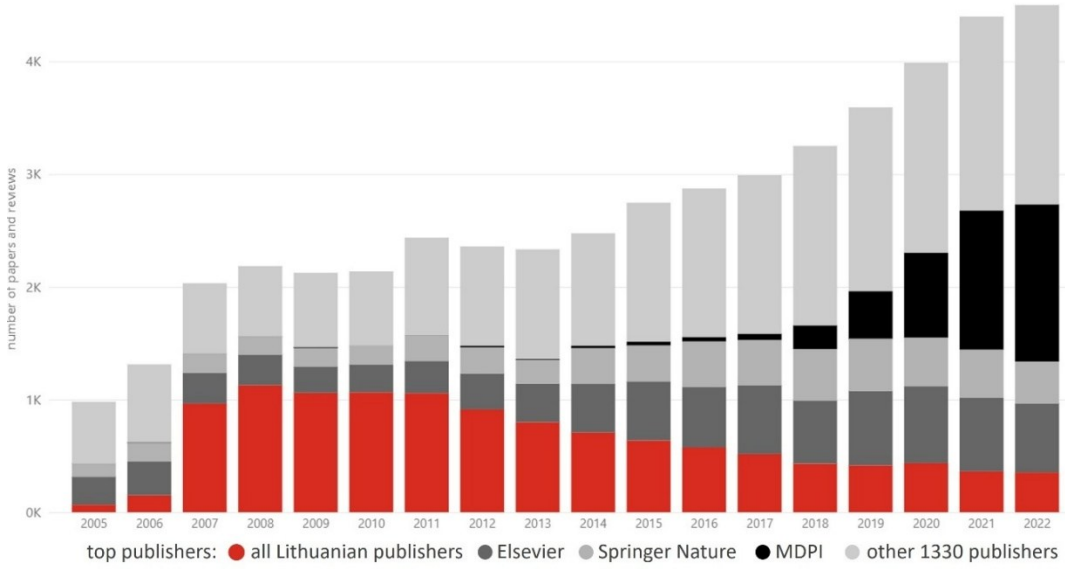

Figure 4. Top publishers of Lithuanian outputs, 2005–2022,
WoS (SCIE, SSCI, A&HCI, ESCI).

The mistrust of domestic journals and the desire for Lithuanian researchers to publish abroad were evident in interviews and even in public statements by civil servants. Some policymakers highlighted mass media articles that exposed questionable practices in university journals, signalling a clear message that institutional strategies needed to change.

3.5.3. Responding to public scrutiny and policy pressure

In 2011, while Council experts were assessing institutional submissions, the most popular Lithuanian mass media portal published three critical opinion pieces, targeting the country's three largest universities. These critical pieces, written by a Lithuanian research fellow working at a foreign university, were intended to spark a public scandal and attract the public's attention to unethical strategies.

The first piece (Lašas, 2011a) criticised an institute at the largest Lithuanian university (here termed Univ1) for its lecturers' lack of publications in foreign outlets. Lašas argued that publishing in foreign journals was crucial if the Minister sought to strengthen Lithuanian universities.

The second piece (Lašas, 2011b) targeted the third largest university in Lithuania (Univ3), whose rector had recently boasted of the university's 'extraordinary successes in scientific publishing'. Lašas revealed that Univ3 published 19 journals, six of which were edited by the current and former rectors. He argued that Univ3 had created a 'self-contained publishing machine' that inflated citation metrics through self-citation and other practices, potentially compromising the quality and integrity of Lithuanian research.

The last piece (Lašas, 2011c) focused on similar practices at the second Lithuanian university by size (Univ2). Lašas cited an anonymous source who described the inner workings of this system, revealing a directive instructing faculty to cite specific publications to artificially boost citation metrics. He also called for actions from the President and the Government.

However, even though universities, including Univ2 and Univ3, admitted to manipulation and promised changes (Jackevičius, 2011), no public action was taken by the Government, President, or Ministry. As one policymaker suggested, 'because of university autonomy, no one from outside could tell the university what to do if a university isn't willing to address the issue'.

Despite public scrutiny and criticism, a three-year hiatus (2012–2014) in annual quantitative assessments suggests persistent challenges. This pause likely resulted from policymakers grappling with inflated JIFs in domestic journals, as some interviewees indicated a desire to see institutional publishing practices improve before resuming evaluations. However, a 2014 newspaper article by Darius Čeburnis (2014), another Lithuanian researcher working at a foreign university, revealed that questionable practices continued. Čeburnis detailed how institutional journals were used to artificially inflate publication and citation counts, negatively impacting Lithuania's research standing globally. He emphasised the detrimental effect on honest scientists, whose work was 'drowned in a swamp of low-value outputs'. Although these tactics did not go unnoticed by the Ministry and the Council, leading to the

downgrading of institutional journals in research evaluations, the issue remained a significant concern.

The above-mentioned mass media posts, supposedly authored by potentially members of the Association Futura Scientia, highlighted the potential of diverse actors to influence institutional practices through public scrutiny of unethical behaviours. Founded by Lithuanians who obtained their PhD abroad and primarily work for foreign universities, Futura Scientia actively monitors the nation's research landscape and advocates for reforms to enhance research quality (http://www.futurascientia.lt/en/about-us). Their advocacy, combined with actions taken by the Ministry and the Research Council, creates a dynamic interplay of pressures that can compel institutions to change undesirable publishing strategies.

In response to these issues, the 2015 model of PBFS removed the complex citation requirements of 2010 and 2011, returning to the JIF > 20% AIF criterion. It also introduced a new policy instrument: a special list for journals with artificially inflated citation rates.

3.5.4. The suspended journals controversy

In 2015, Lithuania's research evaluation methodology introduced a new mechanism to address concerns about research quality and unethical practices: an annual list of 'suspended' journals whose articles would be omitted from research assessment results and thus from funding point calculations. According to the PBFS policies, these journals were identified based on low quality (JIF lower than 20% of AIF), inflated citation rates, or other questionable practices. Although primarily focused on journals publishing Lithuanian research, the list also included 130 journals from 33 other countries, including journals from well-known publishers such as Springer Nature, Elsevier, and Taylor & Francis. Thus, the assessment criteria were applied to both domestic and international publications authored or co-authored by Lithuanian researchers.

While aiming to improve research quality, the policy's implementation raised concerns due to its inconsistencies. Firstly, our bibliometric analysis revealed that many suspended journals appeared on the list only in one year, with papers in the same journals in other years not facing rejections. Overall, 11 domestic journals had 675 rejected papers from 2012 to 2019. Likewise, 130 foreign journals had 334 rejected papers, and only a few had significant numbers of suspended articles (Figure 5).

Most foreign journals had only one or a few rejected papers, suggesting that issues were often specific to certain publishing countries, specific institutions, or particular authors, rather than reflecting overall journal quality as it was stated in the PBFS policies. Secondly, since the Lithuanian policymakers' quality requirements (JIF > 20% AIF) can be compared with the journals' quartiles in Clarivate's Journal Citation Reports, we analysed in which quartiles suspended journals were at the time of their suspension. Figure 5 shows that journals with volumes in higher quartiles (Q1–Q3), were sometimes suspended, while some journals with lower quartile volumes (Q4) were not, indicating not only inconsistencies but unpredictability as well.

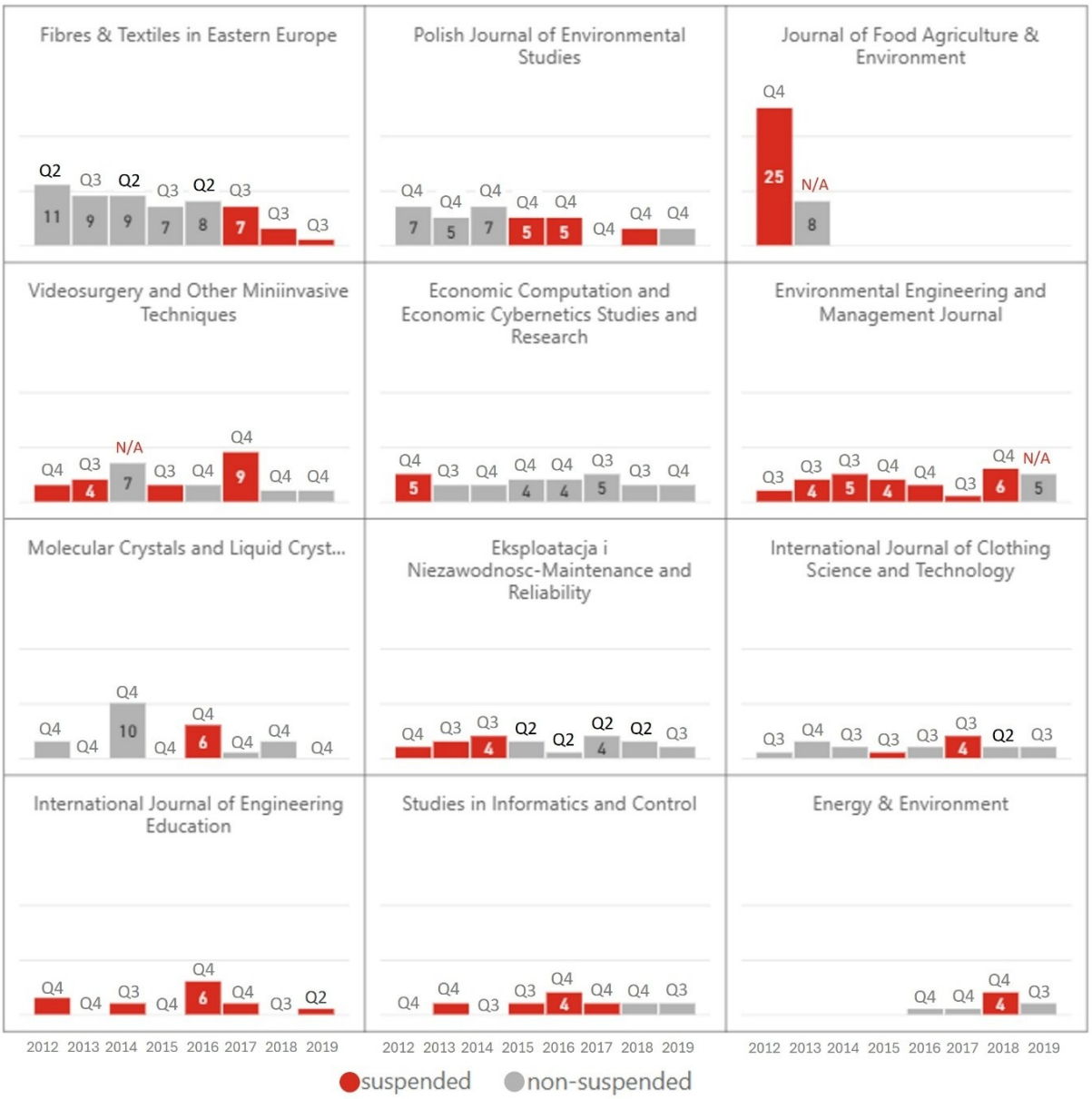

Figure 5. Foreign journals with four or more suspended Lithuanian articles (2012–2019). Red and grey bars denote suspended and non-suspended volumes, respectively.

Within Lithuania, 11 journals—predominantly owned by the largest Lithuanian universities—were included in the list. These domestic journals accounted for two-thirds (2,034) of all Lithuanian articles (2,968) published in suspended journals from 2012 to 2019. The high number of rejected articles in the early years (2012–2015) suggests a concerted effort to address potential country-specific issues within the domestic journal landscape. Yet, as Figure 6 shows, researchers continued to publish in these journals without institutions facing consistent penalties.

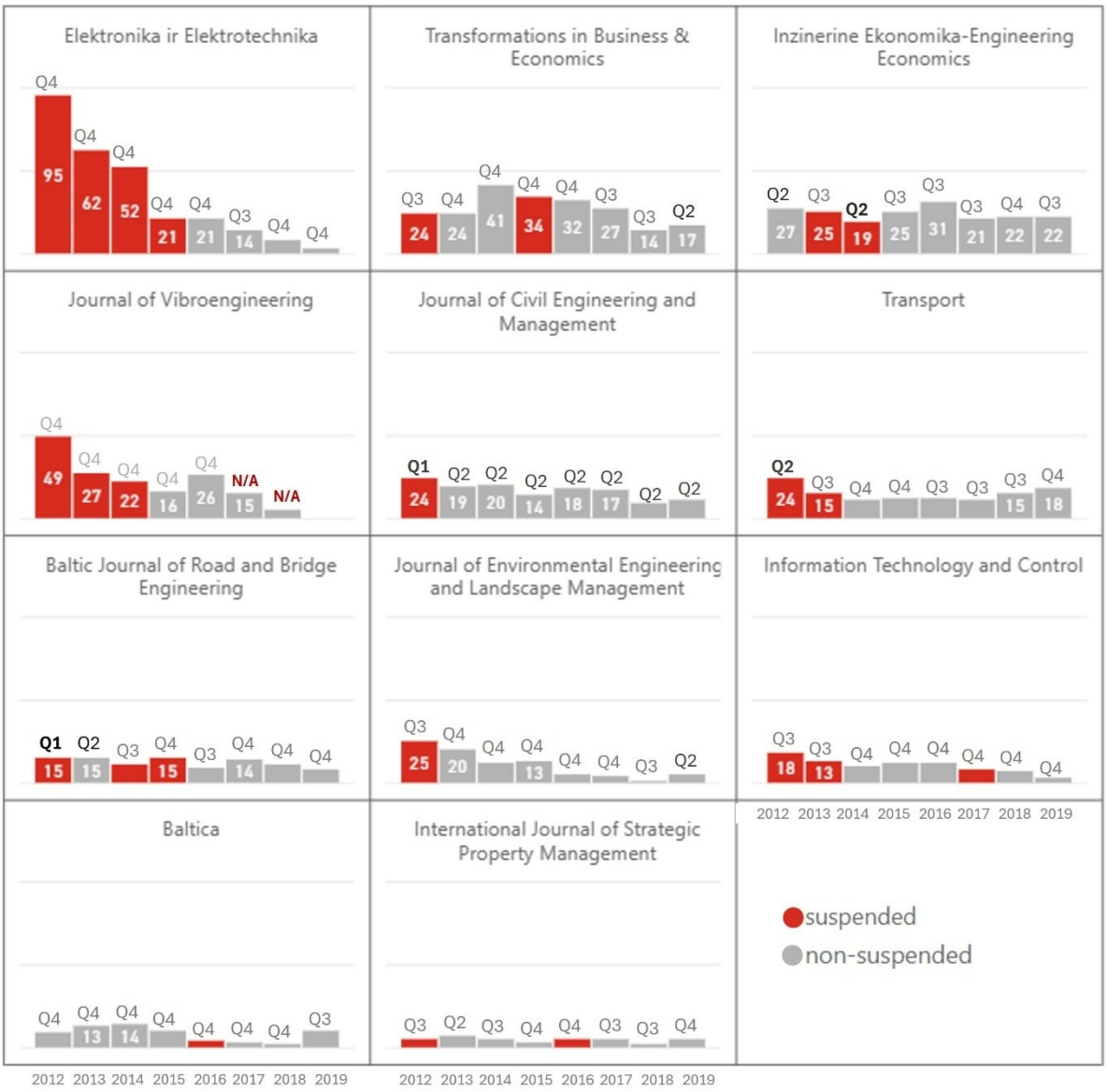

Figure 6. Lithuanian journals with the highest number of suspended Lithuanian articles (2012–2019). Red and grey bars denote suspended and non-suspended volumes, respectively.

Interestingly, nine of the most frequently suspended Lithuanian journals were linked to universities implicated in a 2011 scandal regarding questionable publishing practices, raising questions about a potential connection between the scandal and the subsequent targeting of these journals. This connection underscores the ongoing challenges in maintaining research integrity and the complex interplay between institutional incentives and policy measures.

In a 2016 report following the 2015 assessment (Pečiūra et al., 2016), the Council clarified the two main reasons for journal suspension: (1) inflated citations by the establishment of a citation cartel and (2) low JIFs. They identified ten Lithuanian journals with inflated citations, nine of which also had low JIFs. The report also highlighted that Univ3 had the highest proportion of rejected papers during 2012–2014 (Figure 7).

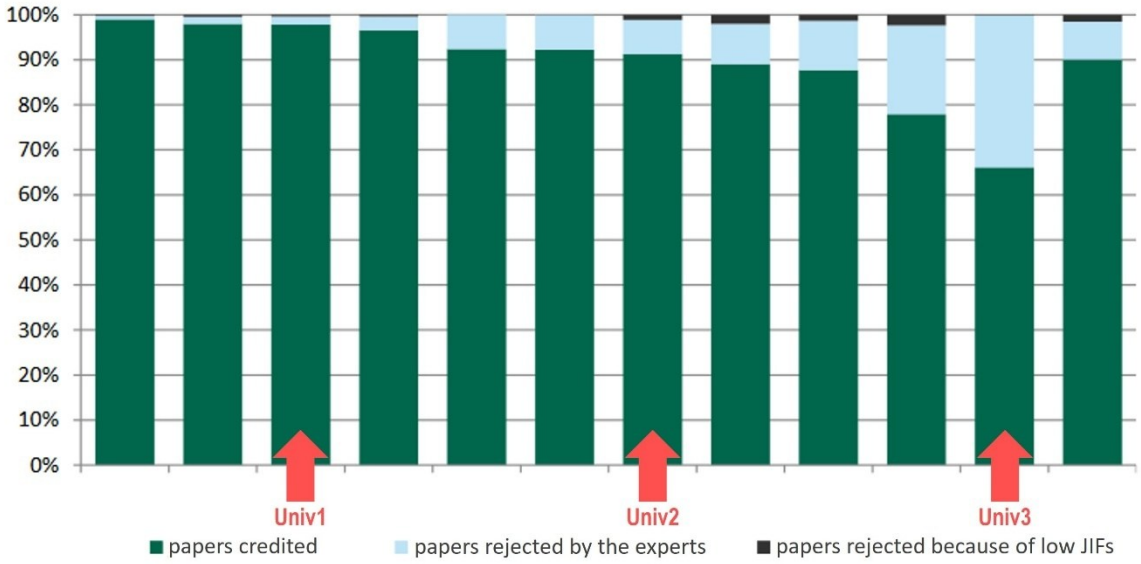

Figure 7. Percentage of credited and rejected papers
by institution in 2012-2014 (Pečiūra et al., 2016).

The suspended journal lists were discontinued in 2020, coinciding with Clarivate's new policy for title suppressions (Clarivate Analytics, 2023). However, the journal suspension procedure remains in the latest regulations, leaving the door open for potential future reinstatement. These findings raise important questions about the effectiveness of the suspended journal lists and their impact on the Lithuanian research landscape.

With a clearer understanding of the policymakers' perspectives and actions, we now turn our attention to the universities and their responses to the evolving PBFS landscape.

3.6. Evolving university strategies in the PBFS landscape

While policymakers grappled with the challenges of aligning national research goals with international standards, universities and research institutions were also actively adapting their strategies to navigate the evolving PBFS landscape. This section delves into the diverse institutional responses and their implications for the broader research landscape.

3.6.1. Institutional responses to policy changes

The introduction of journal suspensions in 2015, a policy measure aimed at addressing concerns about research quality and unethical practices, reverberated throughout Lithuania's academic institutions, with every university and research institution experiencing dozens if not hundreds of rejected publications. While other institutions were less affected, Univ2 (357), Univ3 (310), and Univ1 (152) experienced the most rejections, suggesting a disproportionate impact of the policy instrument on the biggest universities (Figure 8).

A closer look at Figure 8 reveals that the policy predominantly targeted institutional journals, with the majority of Univ2's and Univ3's rejected papers published in Univ2 and Univ3 journals, respectively. Interestingly, the presence of black and blue bars in both the Univ3 and

Univ2 plots indicates cross-publishing between these institutions, with Univ3 researchers publishing more frequently in Univ2 journals than vice-versa. Notably, the *Journal of Vibroengineering*, independently published by a Lithuanian academic affiliated with Univ2, also saw papers rejected from both institutions.

This focus on institutional journals, according to research administrators, may have stemmed from the fact that Univ2 and Univ3 had the largest number of WoS-indexed journals at the time, potentially creating a perceived disadvantage for other institutions that also published in their own journals but lacked WoS indexing (and avoided suspensions). Despite this potential bias, the declining trend in rejected papers across all institutions over time suggests that the policy may have had a broader impact on publication choices beyond simply penalising certain institutions.

Further bibliometric analysis demonstrates that, despite a declining trend in rejections, researchers continued to publish in suspended journals with three leading universities (Figure 9): Univ3 with 835 articles (310 rejected vs 525 credited), Univ2 with 742 papers (357 vs 385), and Univ1 with 391 papers (152 vs 239) in suspended journals. However, the degree to which they persisted varied across institutions: Univ3 and Univ1 only slightly decreased their publication numbers, while Univ2 significantly reduced theirs. This persistence, however, did not apply to the remaining institutions, which had insignificant numbers of articles in suspended journals. Because the suspension policy was unpredictable (akin to a 'lottery'), institutions often submitted all papers for PBFS evaluation, regardless of journal suspension status, while simultaneously encouraging their researchers to seek out publication venues abroad that were less likely to be suspended.

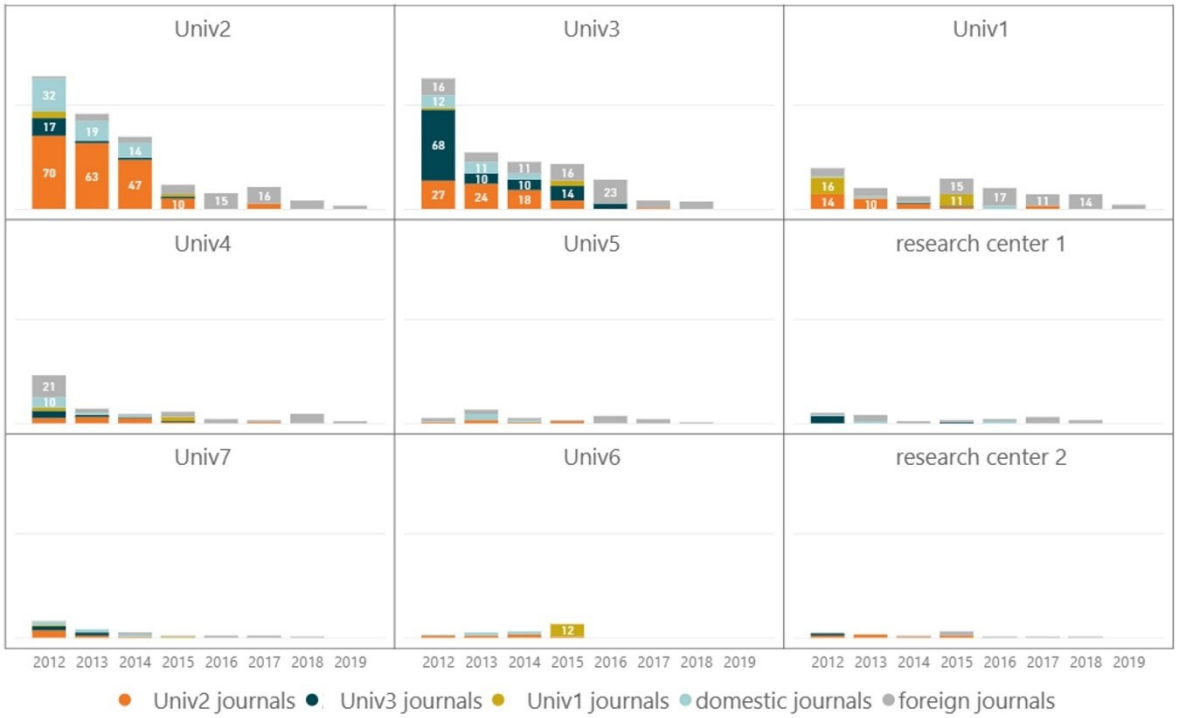

Figure 8. Number of rejected papers by journal publisher for institutions with the highest cumulative numbers of rejected papers (2012–2019).

Institutional strategies extended beyond research itself, encompassing the publication of peer-reviewed journals and the elevation of senior scholars to powerful gatekeeping roles as editors-in-chief (EICs). For journals published by Univ3, for instance, the position of EIC was exclusively reserved for influential senior researchers from Univ3. While public sources (Lašas, 2011-07-25) highlighted that the rector edited three institutional journals and the former rector oversaw three more, interviews revealed a broader influence. The former rector reportedly 'patronised' all institutional journals at Univ3, along with a few at Univ2 and Univ1. At the time, deans at Univ3 also managed one or two journals each in their respective fields.

The hierarchical culture of the university authorities becoming the EICs of journals published by the university was less pronounced at Univ1 and Univ2, but even there, only senior researchers close to the university rectors, vice-rectors, or deans typically ascended to EIC roles. This practice persists in some Lithuanian universities today, where EICs and often entire editorial boards are appointed by university senates, precluding ordinary (non-influential) researchers from assuming journal leadership positions. Nevertheless, addressing the publicly expressed concerns about institutional journals and their EICs, some institutions took action and the EICs either stopped publishing in the journals they edited or formally stepped down, allowing other institutional researchers to become EICs. Other institutions simply appointed editors' close colleagues to these gatekeeping positions at institutional journals.

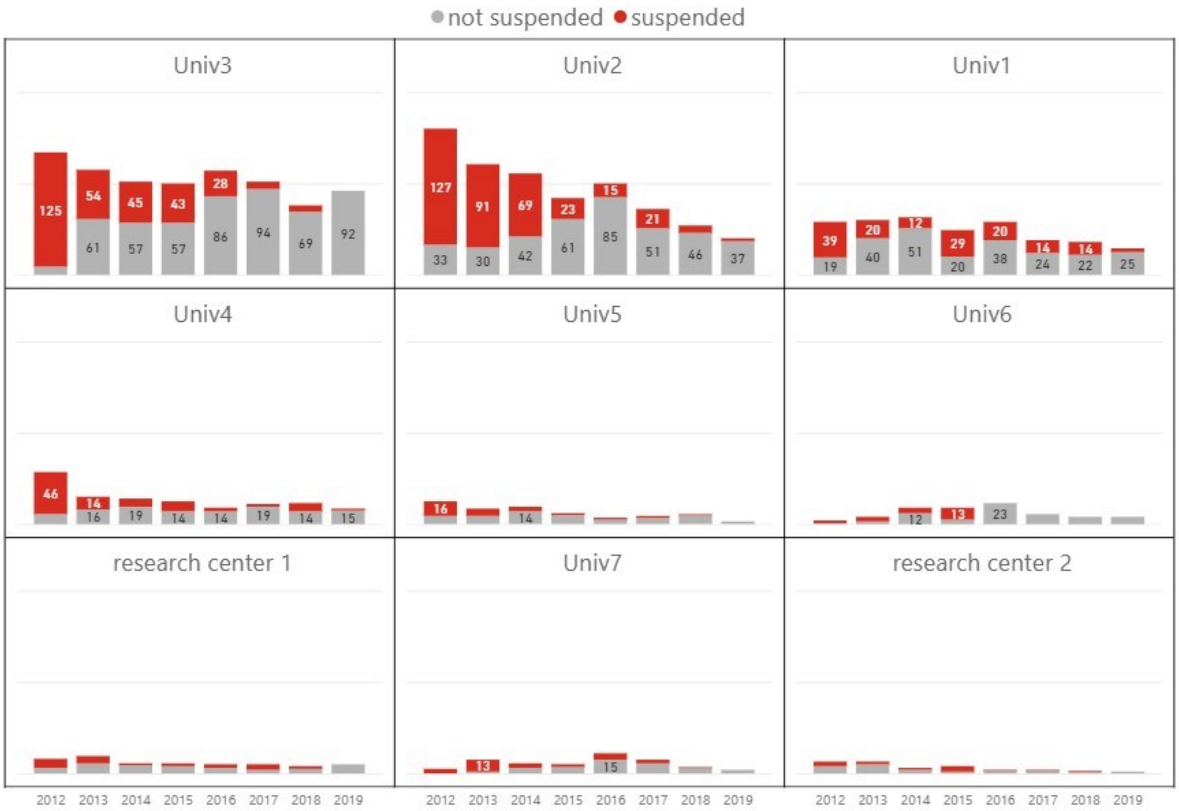

Figure 9. Institutions with the most papers in suspended journals (2012–2019). Articles in suspended volumes in red, those in non-suspended volumes in grey.

University authorities explained in interviews that the pressure to expand institutional journal publishing stemmed from several intertwined factors, primarily the PBFS, which from 2006 to 2018 allocated 100% of state funding for research, with publications accounting for 55% (sciences) to 80% (social sciences and humanities) of this funding in 2012–2018 (Paliokaitė et al., 2015; Zacharewicz et al., 2019). Launching and publishing institutional journals became crucial for institutional survival. With the implementation of the journal suspension policy in 2015, each rejected article from an institutional journal represented a substantial financial loss, prompting the adjustment of institutional strategies.

Concurrently, as policymakers publicly emphasised the internationalisation of Lithuanian research through publishing in foreign journals, universities publishing their journals actively sought out collaborations with 'friendly' journals in countries such as Poland, Romania, and the Czech Republic, often through reciprocal publication agreements. Institutional journals, in turn, became valuable assets for establishing these international partnerships, as they offered a platform for collaboration and exchange with foreign universities, particularly those in post-Soviet countries where politicians also aimed to boost international publications.

Medicina, a never-suspended journal owned by a Lithuanian university and not yet mentioned, offers a noteworthy example of an institution successfully adapting the publishing strategy of one of its journals to the changing policy landscape. After joining WoS, *Medicina* partnered with Elsevier, receiving its first JIF in 2014 and improving its ranking from Q4 to Q3 in 2018. A subsequent partnership with MDPI further boosted its JIF (Q2 in 2020) and publication numbers (from 109 articles in 2018 to 1840 in 2022, according to Clarivate's Journal Citation Reports).

Another interesting case is provided by the *Baltic Journal of Road and Bridge Engineering*, published by Univ3 and implicated by policymakers in a citation cartel. The journal was suspended three times, in 2012 (then a Q1 journal), 2014 (Q3), and 2015 (Q4). In 2018, the journal was transferred from Univ3 to a university in close proximity, possibly in an attempt to escape the media criticism and fluctuations in national research assessments associated with the suspensions of Univ3 journals. Some Univ3 authors continued to publish in the journal, even though this probably did not offer them the level of recognition they would get from publishing in top-tier international journals.

Finally, the interviewed research administrators also proudly pointed to a way to increase foreign authorship in institutional journals: organising international conferences and suggesting institutional journals as outlets for the best conference papers. Research administrators noted that some new journals emerged from the proceedings of regularly held conferences, a practice that warrants further investigation to fully understand its impact on institutional publishing strategies and the broader research landscape.

3.6.2. Researchers' responses to policy changes

While institutions adapted their strategies, individual researchers also faced challenges and developed their own responses to the policy changes. Our bibliometric analysis identified 4,891 unique authors (both Lithuanian and foreign) on Lithuanian papers published in journals

that appeared on the suspended lists between 2012 and 2019. Of these, over half (2,612) were likely unaffected by the suspensions, having published only in non-suspended volumes. The remaining 2,279 authors had at least one paper in suspended volumes, with 1,296 having published exclusively in suspended volumes and 983 in both suspended and non-suspended volumes.

Among the 2,279 authors directly affected by the policy, 1,609 had only one paper in a suspended volume, 384 had two rejected papers, and 272 had three to eight rejected papers. This suggests a limited individual impact, reinforced by the fact that nearly a thousand researchers continued publishing in once-suspended journals. Interviews with researchers suggest this persistence is due to the crucial role of WoS publications in their academic careers. In Lithuania, WoS publications are essential for doctoral defences, promotions to professorship, maintaining minimum qualifications, and participating in expert evaluations and competitive funding programs. Since academic advancement often depends on the number of WoS publications and is managed by institutions that have not yet integrated these unpredictable suspension policies into their regulations, many researchers were relatively unconcerned about the policy's potential impact on their careers.

Importantly, some interviewed scientists mentioned that highly productive researchers often facilitate the career advancement of colleagues through co-authorship opportunities and professional networks. They can offer collaborations, mentorship, and access to publication venues, particularly if they hold editorial positions. This can be especially helpful for less productive colleagues seeking tenure or promotion. These prolific authors also benefit research administrators by contributing to the university's overall research output and reputation in various rankings. However, the extent and impact of these practices warrant further investigation.

Notably, a micro-level bibliometric analysis identified 13 Lithuanian researchers from the three largest universities with more than eight—in one case, as many as 32—rejected articles in the period 2012–2019. However, some of these researchers still contributed significantly to their institutional outputs by having twice as many non-rejected articles in the suspended journals during 2012–2019. The following subsection demonstrates how the most suspended researchers adjusted their publishing behaviour before and after the journal suspension policy was introduced.

3.7. Case studies of researcher responses

Almost all researchers with more than eight articles rejected due to journal suspensions were affiliated with Lithuania's three largest universities: Univ3 (2 individuals / 46 rejections), Univ2 (8/66), and Univ1 (2/24). We now take a more detailed look at these researchers to gain further insight into their experiences and responses to the journal suspension policy.

3.7.1. Univ3 case

Univ3 is home to the two authors with the most rejected papers: Author111 (32 of 111 papers) and Author39 (14 of 39). Author111, a former rector at Univ3, published across 18 journals

(five owned by Univ3, where he served as EIC for three) in business and economics, engineering, computer science, and other disciplines. The two authors co-authored 11 of their rejected papers and were both recognised as Highly Cited Researchers by Clarivate.

Media scrutiny and the suspension policy may have led Author111 to resign as EIC from one and later from all three journals, yet he remains listed as the founding editor and deputy editor of these journals in economics, management, and engineering. His frequent co-author, Author39, now leads one of these journals. This suggests a strategic shift to maintain influence within the publication landscape while adhering to the new policies.

Author111's papers have 166 co-authors, most of whom are from Iranian universities and thus unaffected by the suspension. Among these co-authors, 115 appeared only in non-rejected articles, 25 in both rejected and non-rejected articles, and 26 exclusively in rejected articles. This latter group includes the rector of Univ3. These figures suggest Author111 played a significant role in facilitating publication for a range of researchers, including high-ranking officials. Since 2019, Author111 has shifted focus towards international journals, for instance published by MDPI (52 articles), Elsevier (23), and Springer Nature (14), while maintaining a smaller presence (11 articles) in Univ3 journals.

Policymakers and interviewees from other universities described Author111 as influential at Univ3 despite negative perceptions of the institution. The rejection of Author111's articles co-authored with the Univ3 rector or with EICs of other university journals, along with other rejections involving vice-rectors or deans and published in Univ3 journals, suggests that the Council experts may have targeted high-ranking officials publishing in institutional journals.

This Univ3 case highlights the broader systemic effects of state-level policy interventions and the difficulty of overcoming existing power structures at institutions.

3.7.2. Univ2 case

Between 2012 and 2019, eight Univ2 researchers published a total of 85 papers in suspended journals, of which 66 were rejected. These articles were exclusively in Univ2's institutional journals. Two groups of researchers can be distinguished. The first group consists of six less productive authors in engineering disciplines. They primarily published in institutional journals, both before and after the suspension, with a recent shift towards MDPI journals. The second group comprises two highly productive authors in computer science and engineering. After their papers in domestic journals were rejected, they shifted their focus to international journals. Despite having no co-authored papers in the suspended journals, these two authors have co-authored 114 papers since 2019, focusing on journals published by MDPI, Springer Nature, and Elsevier. Notably, one of the authors has a total of 167 papers in MDPI journals.

The reasons behind these differing responses to the suspension policy remain unclear. The continued publication in domestic journals by the less productive authors might be attributed to fulfilling academic requirements or career advancement needs, particularly as all six are currently professors. In contrast, the highly productive authors strategically shifted to international venues, thereby maintaining their publication records and contributing to the

increase in Lithuanian papers in international journals. The divergent paths taken by the two groups of authors suggest a lack of a clear institutional policy in response to the suspensions.

The Univ2 case highlights the importance of understanding individual-level responses to state-level interventions when aiming for effective policy implementation.

3.7.3. Univ1 case

Univ1 is represented by two researchers with distinct publication patterns. The first researcher, working in business and economics, has 54 papers (10 rejected) across six suspended journals. He also has numerous affiliations and serves as EIC of a Univ1 journal. This researcher ceased publishing in the Univ1 journal after 2017 but maintained his editorial position. This shift may reflect efforts to address concerns about publication practices. Since 2019, this researcher has focused on publishing in MDPI (81 papers), Elsevier (74), Wiley (25), and Springer Nature (18) journals.

The second researcher, working in the medical sciences, has 17 papers in suspended journals. 13 papers in one journal were rejected, and one paper in another journal was rejected. Since 2019, this researcher has published predominantly in MDPI journals (37), including ten articles in the Lithuanian journal *Medicina* discussed in subsection 3.6.1.

This Univ1 case highlights the importance of considering contextual factors such as disciplines, researchers' productivity, and their ability to publish abroad as well as their EIC positions when evaluating the impact of policy interventions on individual-level publishing strategies.

The three cases discussed in subsection 3.6.3 reveal that researchers' responses to journal suspensions are not uniform and may, for instance, depend on disciplinary norms and researchers' productivity. While some researchers strategically shifted to international venues, others continued to rely on suspended journals, with their motivations and institutional policies remaining unclear.

3.8. Discussion and conclusions

This study reveals the dominant role of scientific elites in shaping the Lithuanian PBFS from 2005 to 2022, both through their direct influence and through the institutional strategies they promote. The policy dynamics we have studied encompass multiple levels of governmental, institutional, and individual action; diverse participants such as politicians, civil servants, university authorities, scientific elites, and non-state actors influencing the development of the PBFS; and multiple interdependent issues including the conflict between state and institutional goals, the variety of research assessment instruments, and the prioritisation of quantitative indicators. Our empirical findings offer detailed insights into the policy dynamics through which the quantitative bibliometric-based PBFS developed over a seventeen-year period, enriching our understanding of the complex policy processes at play. Moreover, they contribute to the evolution of theoretical frameworks for policymaking within the public science system.

The evolution of the Lithuanian PBFS can be understood in terms of *multi-level*, *multi-actor*, and *multi-issue* dynamics. As our findings show, *multi-level governance*—state, institutional, and individual—played a significant role in the development of the Lithuanian PBFS, which aimed to improve research quality and accountability. The Ministry, often led by elected researchers, held the formal power to set policy and funding formulas. However, the Council, primarily composed of scientific elites, wielded significant influence in implementing and shaping these policies through their expertise and advisory role. Universities, driven by the incentive to secure state funding, also actively participated in shaping the PBFS. They strategically published their own journals, appealed unfavourable requirements, and influenced policy through collective advocacy.

Moreover, examining *multi-actor involvement* reveals that scientific elites wielded significant power at all levels of governance within the Lithuanian PBFS. They held key positions in the Ministry, the Council, and the universities. Through all of these, they exerted political influence, leading them to act on every level of governance. Scientific elites sought and obtained the involvement of actors from outside Lithuanian academia, such as the President of Lithuania and members of the parliament, to settle a dispute over research evaluation in the Constitutional Court (Dagienė et al., 2024). Furthermore, some of them employed questionable strategies to compete for research funding, attracting the attention of independent researchers and leading to public scrutiny—and ultimately to the journal suspension policy. As our results show, with the journal suspension instrument policymakers primarily targeted domestic journals, exceptionally prolific authors, and university authorities. The behaviour of scientific elites across all levels of governance has been instrumental in shaping PBFS models and performance metrics, contributing to the multiple issues within the PBFS.

Additionally, *multiple interdependent issues* stemmed, firstly, from the clash between the PBFS goal of promoting quality and internationalisation and the institutional imperative to maximise state funding. This conflict bore unintended consequences, such as the proliferation of institutional WoS-indexed journals and strategic publication practices aimed at gaming the system. The journal suspension policy, introduced to address both issues, further illustrates their interdependence. While intended to improve research quality, the suspension policy's unpredictable implementation and disproportionate impact on domestic journals created new challenges of its own. Consequently, Lithuanian researchers shifted towards potentially controversial journals published by MDPI (Oviedo-García, 2021; Stefenelli, 2021), raising questions about the actual improvement in research quality.

Overall, our findings highlight the limited power of the Ministry-level governance to influence institutional practices due to university autonomy, underscoring the complex interplay between state-level policy and institutional-level responses. After years of relying on quantitative formulas and bibliometric assessment, the Ministry successfully (even though with resistance) piloted a UK-like peer-review PBFS model in 2014 (Arnold & Angelis, 2014). However, after the introduction of the state funding 60/40 split between peer-review and metrics-based PBFS models in 2018, the scientific elites once again challenged the Ministry in the Constitutional Court (Constitutional Court, 2020). The legal challenges following almost every major change in research assessment policies led to the 'legitimate expectations'

principle often mentioned by interviewed policymakers, creating a risk-averse and potentially stagnant policy environment and hindering flexibility in the Lithuanian research assessment landscape.

All in all, the evolution of the Lithuanian PBFS serves as a cautionary tale, demonstrating the potential pitfalls of a research assessment system dominated by a single group of interested actors (scientific elites) acting at every level of governance. Although scientific elites possess invaluable expertise, their influence has resulted in undesirable outcomes: proliferation of institutional journals, questionable publishing behaviour, and a cautionary policymaking environment. To overcome these undesirable outcomes, the policymaking landscape requires not only expertise but also the active participation of diverse stakeholders, including independent researchers and citizens. As a small country with such a rich policymaking experience, Lithuania has the potential to develop its own approach, in alignment with international best practices.

Data availability

This paper is based on three types of data – Lithuanian research assessment policies, interviews with Lithuanian policymakers and scholars, and WoS bibliometric data. The Lithuanian research assessment policies are freely available in the Register of Legal Acts managed by the Office of the Seimas of the Republic of Lithuania (see https://www.e-tar.lt/portal/en/index). We promised the interviewees that they will remain anonymous, so the interview data is unavailable. The WoS data is of a proprietary nature and therefore cannot be shared. Accessing the data requires a WoS subscription.

Chapter 4.
Prestige of scholarly book publishers: An investigation into criteria, processes, and practices across countries

This chapter is based on:
Dagienė, E. (2023). Prestige of scholarly book publishers—An investigation into criteria, processes, and practices across countries. *Research Evaluation*, 32(2), 356–370.
https://doi.org/10.1093/reseval/rvac044

4.1. Introduction

For several decades, policymakers in many countries have incentivised researchers to promote "excellence" by publishing research findings through the "most prestigious channels." Within the realm of academia, the narratives such as "excellence", "quality", "quantified control" (Burrows 2012; Lamont 2009; Moore et al. 2017) used in relation to funding allocation in the academic "prestige culture" (Fyfe et al. 2017) affect how researchers percept the "quality" and "prestige" of book publishers. However, no complementary phenomenological investigation has explored further what actually goes on in the "murky world of academic preferment" (Cronin and La Barre 2004). Acquisition librarians were the first who surveyed researchers to determine the "quality" of publishers (Lewis 2000; Metz and Stemmer 1996) to support the development of library collections. While scientometricians surveyed academics to identify "quality indicators" for books and their publishers for using them in compiling the ranking of publishers (Gimenez-Toledo, Tejada-Artigas, and Manana-Rodriguez 2013).

Apart from this traditional method, many attempts have emerged to quantify the book assessment, evaluate books' impact, and distinguish their publishers using libcitations (White et al. 2009; White and Zuccala 2018); book reviews (Zuccala and van Leeuwen 2011; Zuccala and Robinson-García 2019); or a set of digital indicators (Neville and Henry 2014). The newest qualitative and quantitative initiatives are often experimental (Giménez-Toledo, Mañana-Rodríguez, and Tejada-Artigas 2015), while efforts to be purely quantitative, sometimes, lack clearly stated policies (Basso et al. 2017; Williams and Galleron 2016).

Almost two decades ago, Nederhof et al. (Nederhof, Luwel, and Moed 2001) constructed three indices: "a quality weight", "an (inter)national visibility weight", and "a combined index for publishers" assessing publishers in linguistics. Currently, ranking publishing channels and compiling lists of prestigious publishers are common practices for metric-based funding systems. Norway implemented the first thoroughly documented ranking of publication channels (journals, book series, and publishers) in 2005; often called the Norwegian model (Sivertsen 2018). Denmark and Finland adopted this widely discussed and extensively followed approach, identifying top-level publishers in 2008 and 2012, respectively. One of Belgium region, Flanders takes a somewhat different approach by differentiating publishers according to their peer review practices (Giménez-Toledo et al. 2016).

Lithuanian policymakers began using the term "prestigious publisher" in 2005. Still, nobody has investigated the book assessment practices that policymakers have used for over twenty-five years. Williams et al. (2018) have described some Lithuanian procedures as "an essentially bureaucratic decision on what is and what is not a book." For sure, Lithuanian institutions earn funding points in the national Performance-Based Funding System (PBFS) for every fourteen pages of eligible books or chapters in edited volumes. For instance, Verleysen and Engels (2018), discussing weight ratios of publication types, do not suggest the possibility of considering the number of pages of a publication in research evaluation. There

is one more distinctive Lithuanian feature in assessing *book outputs in the sciences*[2]. Only books published by prestigious foreign publishers earn points (and state funding) for institutions, they get nothing for books published by "ordinary" publishers. This has elevated publisher prestige to the utmost importance for Lithuanian institutions. Moreover, while formal national regulations define the notion of a prestigious publisher, the decision whether a specific publisher is prestigious or not depends strongly on the opinion of anonymous experts.

Few empirical studies have investigated the consequences of book assessment based on publishers' judgements. Only a handful of papers examine the Norwegian model (Aagaard, Bloch, and Schneider 2015) or emphasise challenges in verifying the prerequisites for publishers of academic book outputs (Borghart 2013). Several papers flag the unexpected potential consequences of national performance-based funding systems on research practices (Aagaard 2015; Faggiolani and Solimine 2018; Hammarfelt and de Rijcke 2015; Rowlands and Wright 2021). These studies provide a background for more extensive research, particularly concerning the possible implications of assessing books based on their publishers' prestige. At the same time, there is still an ongoing debate in research evaluation studies about the endeavour of ranking book publishers per se (Giménez-Toledo et al. 2015), and information is scattered in the literature.

The main goal of this paper is to get more insight into the validity and desirability of the systems for rankings of book publishers in different countries, to bring information together in an integrated way, and to provide additional empirical insights from Lithuanian practices.

In this chapter, I intend to answer the following research questions:

RQ 1: What methods are employed in Lithuania to identify prestigious publishers in assessing book outputs, and how do these methods differ from those used in other countries?

RQ 2: To what extent do assessments of book outputs based on the prestige of book publishers yield consistent results, both over time and between countries?

RQ 3: To what extent is it possible to verify whether book publishers meet the formal prerequisites of national assessments?

Using a mixed-methods approach, I will explore the ways publishers' prestige is determined across countries. This study will contribute to a deeper understanding of the complexity of assessing scholarly books. It will also identify the uncertainties of a process in which books are evaluated based on their publisher's prestige.

4.2. Research design

This paper presents a case study that combines qualitative and quantitative methods. A qualitative document analysis was performed to study two related phenomena: *the assessment of scholarly book publishers* and *the methodologies and practices used to determine*

[2] The term "the sciences" refers to all fields of research except for the social sciences and humanities.

prestigious publishers. I used a snowball method to gather relevant literature starting from Sivertsen's (2018) extended explanation and retrospective of the Norwegian and other related models. Research papers, edited volumes, regulations, reports, and grey literature were examined to identify rules and practicalities related to the assessment of scholarly books and their publishers. As an example, the documents, regulations, research papers and other information associated with the Norwegian Publication Indicator—as the best-documented indicator, followed by other countries—were obtained from its webpage "About NPI"[3] (henceforth referred to as the NPI). Rankings of publishers and the publication points earned by Norwegian institutions were taken from the Norwegian Register for Scientific Journals, Series and Publishers[4] (henceforth referred to as the Norwegian Register). Lithuanian legal acts containing the methodologies for the formal evaluation of research produced by research and higher education institutions were obtained from an official database: The Register of Legal Acts of the Republic of Lithuania (TAR)[5].

For the bibliometric investigation, I chose the Lithuanian book outputs submitted by institutions to the national metric-based funding systems from 2005 to 2016. I thoroughly examined bibliographic data on registered books assessed by anonymous panel experts. Then, I identified publishers that were awarded both the highest category (prestigious publisher) and at least one other category (not-so-prestigious or non-prestigious). Such discrepancies in judgements about publishers have been discussed within Lithuanian academia at all levels (departments, faculties, and universities) for years. These results are significant for researchers because institutions operate internal incentive schemes reallocating funds received after these annual assessments. However, I only studied issues related to publishers' prestige and did not analyse the institutional incentive schemes.

Bibliographic information on Lithuanian book outputs was derived from databases managed by the Lithuanian Research Council: (1) Dynamics of Lithuanian Research Potential[6] for outcomes published from 2004 to 2008; and (2) Reports on Scientific, Arts and other Relevant Activities of Research and Higher Education Institutions[7] for outputs published from 2009 to 2016. From a bibliographical perspective, the compiled records had various shortcomings. So, I enriched the primary bibliographical data with manual searches of the missing details in multiple catalogues: the National Bibliographic Database by Martynas Mazvydas, National

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[3] Norwegian Publication Indicator (NPI) <https://npi.hkdir.no/> accessed 21 July 2024.

[4] Norwegian Register for Scientific Journals, Series and Publishers <https://kanalregister.hkdir.no/publiseringskanaler/Forside/publiseringskanaler> accessed 21 July 2024.

[5] Register of Legal Acts of the Republic of Lithuania (TAR) <https://www.e-tar.lt/portal/en/index> accessed 21 July 2024.

[6] Lietuvos mokslo potencialo dinamika [The dynamic of the Lithuanian research potential] <http://www.mokslas.mii.lt/mokslas> accessed 21 July 2024.

[7] Mokslo ir studijų institucijų mokslinės, meninės ir su jomis susijusios kitos veiklos ataskaita [Reports of outputs submitted by research and higher education institutions after research assessments] <https://mokslas.lmt.lt/INSTITUCIJOS/> accessed 21 July 2024.

Library of Lithuania[8], the Lithuanian Academic Electronic Library[9], WorldCat catalogue[10], and on the web.

ISBNs are mandatory prerequisites for scholarly books in almost all countries, including Lithuania, and registrants of ISBNs can be presumed to be responsible for the content they make publicly available. Thus, I recognised the ISBN registrants as the publishers in the analysed dataset. I chose the Global Register of Publishers (GRP) as a primary, reliable, and freely accessible resource about registrants of ISBNs created by the International ISBN Agency[11]. I derived from the GRP further data about the ISBN registrants of the books in our dataset, enriching bibliographical information for book outputs gathered from the Lithuanian Research Council databases.

Many papers on scholarly book evaluation focus on the social sciences and humanities, even though in Norway, Finland, and Denmark (countries that rank publishers to assess book outputs), academic book publishers are not divided into academic fields. In this paper, presenting Lithuanian book assessment results, I separate between the sciences, the social sciences, and the humanities because Lithuanian regulations apply stricter requirements for book outputs in the sciences than in the social sciences and humanities (see subsection 4.3.5). Additionally, the Lithuanian regulations set no criteria for publishers of conference proceedings; therefore, I excluded 50 publications records from the initial dataset of 4135 records (Dagienė et al. 2019) as a thorough investigation of experts' comments revealed that they were conference proceedings published as edited volumes and assessed as conference proceedings.

The final dataset of Lithuanian book outputs (books and edited volumes without conference proceedings) reflects institutional submissions of 4085 unique titles having ISBN codes published from 2004 to 2016. The experts positively assessed 3712 (out of 4085) reported book outputs and scored them according to their publishers' prestige. In these cases, the publisher was classified as prestigious or not-so-prestigious. The panels rejected the other 373 titles as inappropriate mainly because the publisher was considered non-prestigious. The analysis focuses on the book publishers for which the experts were not consistently classifying them as prestigious, not-so-prestigious, or even not prestigious.

4.3. Defining prestigious book publishers

Numerous research papers confirm that modern research evaluation systems increase the pressure on researchers to publish more and reinforce their "publish or perish" habits, which significantly changes the publishing patterns of both journal papers and scholarly books (Broz and Stöckelová 2018; Butler 2003a; De Rijcke et al. 2016; Elton 2000; Good et al. 2015; Moed 2008; Osuna, Cruz-Castro, and Sanz-Menéndez 2011). Some studies show that scholars adjust

[8] National Bibliographic Database <https://ibiblioteka.lt> accessed 21 July 2024.

[9] Lithuanian Academic Electronic Library <https://www.lvb.lt/> accessed 21 July 2024.

[10] WorldCat catalogue <https://www.worldcat.org/> accessed 21 July 2024.

[11] The Global Register of Publishers <https://grp.isbn-international.org/> accessed 21 July 2024.

their behaviour in response to these requirements of research assessments, especially when the number of publications is explicitly linked to their research funding.

The research assessment regulations best reflect the policymakers" perceptions of the "quality" of book outputs. Analysing policies, I found that countries applying qualitative research assessment (peer-review) do not emphasise book publishers' prestige. Meanwhile, countries with at least partial metric-based funding systems rank publishers, so funding points awarded to book publishers.

Book evaluation in countries having qualitative (peer review) research assessment systems. In the UK, experts assess the quality of published research outputs (and books among them) by reading the actually submitted books (Rosenberg 2015), which institutions select as their best outcomes. According to the Research Excellence Framework (REF) policies, panel reviewers evaluate three distinct elements for each submission: the quality, the impact beyond academia, and the environment that supports research[12]. Also, there is a statement:

> *"53. No sub-panel will make use of journal impact factors, rankings or lists, or the perceived standing of the publisher, in assessing the quality of research outputs." (REF 2014 2012)*

Nevertheless, several reports with widespread scope commissioned by the UK's Higher Education Funding Council for England (HEFCE) investigate metrics and possible changes in the assessment process. The Metric Tide (Wilsdon et al. 2015) discusses book-based indicators, among other metrics, and Crossick (Crossick 2015) examines the issues around open access for monographs. The latter relates to policymakers' intention to mandate open access monographs as book outputs in the REF in 2027 (Lockett 2018).

There are more independent reports on the REF2014 results. In one, Tanner (Tanner 2016) provides a thorough analysis of publishing data on books submitted across the arts and humanities—the experts assessed 8,513 books produced by 1,180 unique publishers. Tanner's conclusions include:

> *"As far as can be ascertained from the available data, attempting to assess books through a purely quantitative method would be nigh on impossible to do fairly or equitably. […] This study adds further evidence to the sense that bibliometrics remain a very unhelpful means of analysing books for research excellence." (Tanner 2016)*

A general independent review on REF2014 results, widely known as the Stern Review (Stern 2016), includes a recommendation supporting the current peer review based assessment and emphasises that if the metrics are provided to inform the evaluation, they should be used transparently.

Similarly to the UK, it looks like publishers' status is currently not a decisive factor in France (Williams and Galleron 2016) or Italy (Basso et al. 2017; Faggiolani and Solimine 2018). Nevertheless, an Italian study has been conducted investigating the possibilities of employing

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[12] The Research Excellence Framework (REF2021) <https://webarchive.nationalarchives.gov.uk/20180319165633/http:/www.ref.ac.uk/about/whatref/> accessed 21 July 2024.

quantitative metrics to assess books (Basso et al. 2017). Researchers conclude that classifying publishers is fraught with difficulty (Williams et al. 2018) and suggest surveying researchers, as was done in Spain (see subsection 4.3.1). Nevertheless, Giménez-Toledo et al. (Giménez-Toledo and Román-Román 2009), based on a thorough systematic review, conclude that although there is no simple way to determine the "prestige" of publishers, publishers' ranking is predominant in the research assessment.

*The importance of publishers' prestige varies in countries with metric-based assessment funding system*s (Giménez-Toledo et al. 2019). In the Czech Republic, the actual publisher of book outputs was of no significance until 2013, when panel peer review evaluation was introduced (Broz and Stöckelová 2018); and the current formal criteria do not mention the importance of publishers (Government of the Czech Republic 2018). In Poland, researchers could self-publish monographs that meet the formal criteria for metric-based assessment funding (Kulczycki 2018) until the List of Scientific Publishers was introduced in 2018 (see subsection 4.3.4).

Meanwhile, there are countries which extensively rank the publishers for years. Norway introduced the first and widely documented ranking of publishing channels in 2005 (Sivertsen 2018), Denmark implemented a similar levelling in 2008[13], and Finland followed them with a national system launched in 2012[14]. More details of these rankings are presented in Sub-sections 4.3.2 and 4.3.3 below.

A slightly different publishers' assessment system was established in Flanders, the Northern Dutch-speaking region of Belgium. The Flemish regulations do not mention the publisher's prestige; the main criterion is peer review—the procedures expected from the book publishers (Verleysen and Engels 2013). The national Authoritative Panel, consisting of professors affiliated with Flemish universities with expertise covering the social sciences and humanities, is authorised to evaluate publication channels (journals, publishers, and book series) against the criteria stipulated in the regulations (Verleysen, Ghesquiere, and Engels 2014). This panel has found the most challenging aspect of its work is to verify the peer review procedures in book output production. In response to the regulations and doubts, the Flemish Publishers Association invented a label, "the guaranteed peer reviewed content." So, the Flemish list of publishers consists of two publisher types—those who handle peer review for all their published books and those who manage peer review for individual books or book series.[15] Thus, the Flemish system has no concept of "prestigious" publishers: Springer, Catholic University of America Press, Oxford University Press, or Berg (to name but a few) are all treated the exact same way.

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[13] The BFI is an element of the performance-based model for distribution of the new block grants for research to universities. In: Ministry of Higher Education and Science, Denmark <https://ufm.dk/en/research-and-innovation/statistics-and-analyses/bibliometric-research-indicator/bfi-rules-and-regulations> accessed 25 April 2020.

[14] Publication Forum in: Federation of Finnish Learned Societies <https://www.julkaisufoorumi.fi/en/publication-forum> accessed 21 July 2024.

[15] The Flemish Academic Bibliographic Database for the Social Sciences and Humanities (VABB-SHW) is a database of academic publications from the social sciences and humanities authored by researchers affiliated to Flemish universities. <https://www.ecoom.be/en/data-collections/vabb-shw> accessed 21 July 2024.

4.3.1. Scholarly Publisher Indicators in Spain

Based on a thorough examination of methods to assess monographs through their publishers, Giménez-Toledo and Román-Román (2009) concluded that "there is no one quality indicator which can be considered determinant and by which the quality of the publisher can be established'.

To find out academics' perceptions of what exactly determines the quality of publishers of monographs, Giménez-Toledo et al. (Gimenez-Toledo et al. 2013) used responses from three thousand Spanish researchers. Considerable variations were revealed within the criteria for the "prestige" of publishers in different scientific fields. As Giménez-Toledo et al. noticed, some of the leading indicators recognised by researchers (peer review, an ongoing trajectory of publications, publishers' monographs being in libraries, and in international databases) partially coincide with those indicated by the Spanish research evaluation agencies: the National Agency for Quality Assessment and Accreditation and the National Commission for the Evaluation of Research Activity. Besides, the surveyed academics pointed out additional indicators of "prestige", such as good reviews in the best journals (in Prestige of Publisher), an adequate structure of publications (in Quality of Publications), or publishers maintaining a presence in foreign bookstores (in Dissemination and Distribution System of the Publisher) (Gimenez-Toledo et al. 2013).

A Spanish information system on publishers entitled the Scholarly Publishers Indicators was created in 2012 and later updated in 2014 and 2018 (Giménez Toledo 2018). Scholarly Publishers Indicators covers only Spanish and international publishers that researchers participating in a survey indicated to be among the top ten in their respective fields; thus, publisher prestige in Spain is field-specific. Accordingly, the Scholarly Publishers Indicators (SPI) ranking allows selection of the most highly valued publishers in sixteen disciplines within the social sciences and humanities. Additionally, the Spanish SPI includes interactive charts: *Manuscripts Selection Processes* (reported by publishers) and *Scholarly Publishers Indicators Expanded* (showing the presence of each book publisher in five information systems)[16].

The SPI is used quite widely in Spain. However, according to Giménez-Toledo et al. (Giménez-Toledo et al. 2016), Spanish assessment agencies use the indicators only as a reference, and their function is to support the decisions of expert panels. Mañana Rodriguez and Pölönen (Mañana Rodriguez and Pölönen 2018) specify that the information concerning scholarly publishers in Spain "is supplemented with further review of the individual titles by expert panels in the context of the applicant's CV" and conclude:

> *"It must also be said that a ranking of publishers based on "quality" does not mean that there is always a direct relationship between a high quality book and a high*

[16] SPIs Expanded showed the presence of each book publisher in five information systems: Book Citation Index (Clarivate Analytics); Scopus Book Titles (Elsevier); Norwegian list (Norwegian categorization of book publishers, used in various European countries); SPI/Book publishers' prestige (I ĽIA/CSIC Research Group); Finnish list (Finnish categorization of book publishers) <http:// ilia.cchs.csic.es/SPI/indexEn.html> accessed 13 Nov 2020 but not opened at the time this PhD thesis were prepared. See the SPI portal <https://spi.csic.es> accessed 21 July 2024.

> *quality publisher. Expert panels therefore need to have access to each individual publication in order to observe this limitation."*

Interestingly, Mañana Rodriguez and Pölönen (Mañana Rodriguez and Pölönen 2018), comparing Finish and Spanish ratings, identified differently ranked publishers (prestigious in one country and primary level in another).

4.3.2. Prestigious publishers in Norway

The widely discussed Norwegian model, developed for indicator-based funding, incentivises researchers to publish in the most prestigious channels within their research area (Sivertsen 2018). This model implies that prominent researchers designate which journals and book series that have met the entry requirements (level 1) are considered prestigious (level 2) in their particular science area; even book publishers in the Norwegian model are not separated by the science areas as in the Spanish SPI.

To better understand the Norwegian ranking of publishers, I investigated the regulations available on two separate portals: the Norwegian Publication Indicator and the Norwegian Register. Both have interfaces in English and provide extensive information on processes for publisher ranking.

According to mandatory regulations declared in the Norwegian Register, to be registered at level 1 (which is the basic entry level), book publishers must submit for primary evaluation: (1) their ISBN prefix, (2) documentation of their scientific publishing programme (not the editorial board), (3) external peer review procedures (an explanation in a PDF file is enough), and (4) proof of their international or national authors (names and affiliations from the last two years). Figure 1 shows the prerequisites in the Norwegian Registry for the entry level 1 and conditions for level 2.

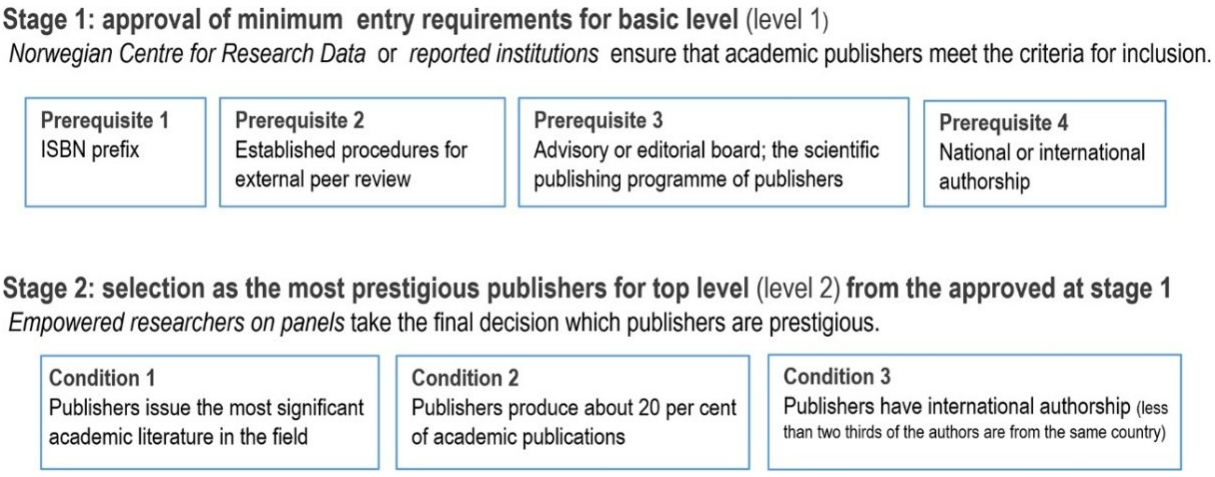

Figure 1. Prerequisites and approval procedures for publication channels of the Norwegian Register

The prestigious level 2 is limited to channels—journals, book series, or book publishers—that issue "the most outstanding works by researchers from different countries." But it is unclear how to identify outstanding works. Even more, the guidelines state that for calibrating

"prestige'—'level 2 publication channels shall together constitute about one-fifth (20 per cent) of the field's total academic publications" (Sivertsen 2018). However, according to the NPI, the Norwegian Register of academic book publishers is not divided into academic fields, and the National Board of Scholarly Publishing[17] "is responsible for the publisher rating levels and updates this annually based on input from academic fields where book publishing is a central or frequent format for publishing research." In addition to the experts" decision, level 2 has a 20 per cent field-based threshold, creating even more ambiguity in identifying the book publishers' prestige.

4.3.3. Publisher rankings in Denmark and Finland

Denmark and Finland have implemented the Norwegian model with some adjustments. The main requirements for an entry level listing correspond with those set in Norway (e.g. peer review before publication). Also, as in Norway, local researchers are empowered to decide which publishers deserve to be designated as prestigious.

In Denmark, the Bibliometric Research Indicator[18] (BFI), announced in 2008 and launched in 2009 (Pedersen 2010), has two types of lists: one for journals, books, and conference series, and the other one for book publishers. These BFI lists were each divided into two levels from 2012 to 2017. Since 2018, these lists have had three publication levels: level 1 (ordinary), level 2 (particularly distinguished), and level 3 (prestigious). Level 3 includes no book publishers but only the most prestigious journals, book series and conferences. The level allocation depends on researchers who serve on expert panels (Danish Agency for Science and Higher Education 2019).

The Finnish Publication Forum[19] (henceforth referred to as the Finnish ranking) was launched in 2012 and currently has three levels for book publishers. From 2012 to 2014, book publishers were only distributed between two levels in a particular proportion. In essence, 90 per cent of book publishers were in level 1, and ten per cent were designated as level 2 (prestigious leading publishers). Level 3 was reserved for a quarter of the level 2 journals and series (not book publishers). Since 2015, some book publishers have been awarded level 3.

It is worth noting that book publishers and the book series they produce are ranked separately, creating confusion in the rankings. But different countries deal with such issues differently. For example, the Norwegian model allows differences in levels, such as a book series can be ranked as level 2, and its publisher ranked as level 1. On the contrary, the Finnish ranking determines that (even if a book publisher was ranked at level 1 before), it must be rated at level 2 if one of its book series is assigned level 2. Despite this, the designers of the Finnish ranking warn: "the quality levels applied in the Publication Forum predict the average quality and impact of large publication volumes, but they are too arbitrary a tool for the evaluation of

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[17] The National Board of Scholarly Publishing <https://npi.hkdir.no/organisering> accessed 21 July 2024.

[18] The Bibliometric Research Indicator (BFI) is a part of the performance-based funding model for distribution of basic funding to Danish universities <https://medialibrary.uantwerpen.be/oldcontent/container50336/files/Faurbaek.pdf > accessed 21 July 2024.

[19] *Publication Forum* is a classification of publication channels created by the Finnish scientific community to support the quality assessment of academic research <https://www.julkaisufoorumi.fi/en> accessed 21 July 2024.

individual publications or researchers" (Auranen and Pölönen 2012; Mañana Rodriguez and Pölönen 2018).

4.3.4. The List of Scientific Publishers in Poland

Poland had a quantitative book evaluation system with some formal mandatory criteria (e.g., monograph's length), and neither the prestige of book publishers nor peer-review, book reviews, citations, or book visibility was measured. According to Kulczycki (Kulczycki 2018), the main weakness in the Polish system was giving the same number of points for books published by Cambridge University Press, books published by a small local publisher, and even self-published books.

Inspired by foreign publisher rankings, the List of Scientific Publishers was announced in Poland in 2018 (Kulczycki 2019). During the initial phase, to identify the most prestigious (level 2) and the less prestigious (level 1) publishers, the Ministry of Science and Higher Education established "the Ministerial group for the lists of scientific journals and academic publishers". This advisory body, consisting of almost 20 academics, prepared the first publisher list based on several data sources: (1) the Finnish Publication Forum; (2) the Norwegian Register for Scientific Journals, Series and Publishers; (3) the Scholarly Publishers Indicators (Spain); (4) the Book Citation Index (Clarivate Analytics); (5) Scopus (Elsevier); (6) data from the Polish research evaluation system to identify publishers of books authored by Polish researchers in 2013-16.

In 2019, the Ministry of Science and Higher Education founded the Research Evaluation Council, consisting of over thirty academics responsible for research assessment of Polish higher education and research institutions. Polish and foreign publishers interested in being included in the List of Scientific Publishers were invited to contact the committee responsible for maintaining the list. The chair of this committee, Emanuel Kulczycki, informed us that the ministry could modify the list prepared by the academics if needed.

The Polish Ministry of Science and Higher Education issued the List of Scientific Publishers in its regulation on December 17, 2020. According to this ministerial order, for every book issued by a level 2 publisher, institutions earned two hundred points in the sciences and three hundred points in the social sciences and humanities. For every book produced by a level 1 publisher, institutions acquired eighty points in the sciences and one hundred points in the social sciences and humanities. For every book published by any other publisher (not included in the List of Scientific Publishers), institutions obtained only 20 points (Kulczycki 2017).

At first sight, Lithuania (a close neighbour of Poland) may seem to have a similar system that distributes points according to publishers' levels. However, Lithuania introduced the List of Globally Recognised Publishers in 2006, soon after dropped it, and revived slightly different lists of prestigious publishers in 2017.

4.3.5. Prestigious publishers in Lithuania

Lithuania introduced a metric-based funding system in 2005 (when Norway launched its Norwegian Register). Since 2005, the Lithuanian regulations have defined "prestigious

publishers" as publishers that (1) continually release publications authored by national and international researchers, (2) distribute their products in many countries, (3) issue globally recognised journals and series of books, and (4) provide enough information about these achievements on their websites. According to the formal Lithuanian definition, prestigious publishers should fulfil each of the four criteria listed above.

In 2006, designers of Lithuania's national performance-based funding system changed some rules. They explained the aims of these amendments, declaring that they seek to incentivise research institutions to work efficiently, raise their international competitiveness, and comply with the state's needs.[20] Within this order for outputs in the sciences (and not for the social sciences and humanities), policymakers introduced *the List of Globally Recognised Publishers*. It comprised sixteen named book producers such as Elsevier Science Group, Springer Group, Oxford and Cambridge University Presses, and similar publishers.

We want to explicitly draw attention to the fact that publishers issuing book outputs in the sciences were assessed *based on their journal publishing activities*. The List of Globally Recognised Publishers concluded by stating that prestigious publishers of monographs are those publishers which issue at least *five peer reviewed journals* indexed in the Journal Citation Reports (Clarivate Analytics, the former Institute of Scientific Information). Officially, the list was revoked soon after, in 2010.

Yet the List of Globally Recognised Publishers is still alive in Lithuanian researchers" minds. From 2004 to 2016, the experts (senior researchers in their fields) consistently scored monographs or edited volumes issued by those sixteen large publishers as the highest-level book outputs produced by prestigious publishers.

From its beginning, he formal Lithuanian metric-based system was a purely quantitative formal assessment. However, in 2009, significant changes happened in the Lithuanian metric-based funding system. The evaluation was divided into two parts: *peer review assessment* (for 20 per cent of institutional outputs) and *formal metric-based assessment* (for the remaining eligible pieces of research). The Research Council of Lithuania still administers this ex-post evaluation. It assigns self-registered senior researchers (henceforth referred to as the experts) into the pool for two expert panels (one for the sciences and the other for the social sciences and humanities). The experts have not been named; they work anonymously. According to the Lithuanian regulations, in the peer review assessment part, the experts evaluate the quality of the research presented in a book; in the formal metric-based assessment part, the same experts should appraise the prestige of book publishers.

4.4. Inconsistencies in assessing the book publisher prestige

In Lithuania, for book outputs in the sciences, the only—prestigious publisher—level exists; books issued by other publishers are simply rejected and not scored. In contrast, any publisher is eligible for book outputs in the social sciences and humanities; however, research works

[20] The Ministry of Education and Science of the Republic of Lithuania, 12 April 2006 order No ISAK-685 (Valid from 7 May 2006, not valid from 19 July 2009) (see in Annex 1).

issued by prestigious book producers earn significantly more points than those published by not-so-prestigious ones.

Analysing the research assessment results, I selected publishers for which Lithuanian experts did not agree on their prestige. Table 1 compiled from the publishers that experts ranked as *prestigious* and at least one other category: *not-so-prestigious* (but sufficient for the social sciences and humanities) or *not-prestigious-at-all* (usually for outputs in the sciences).

Table 1. Publishers awarded by the Lithuanian experts to the highest category and at least one other category in the national research funding assessments from 2004 to 2016, indicating the levels and years these publishers were awarded in the Norwegian Register.

The titles on publishers identified by ISBNs in the Global Register of Publishers (country ISBNs were registered)	The number of books evaluated by the experts and categories publishers received within the years			The scientific level of the publisher and the years from the Norwegian Register
	Prestigious publisher (for all sciences) [a]	Not-so-prestigious, lower category (for SSH, scored)	Not prestigious, outcomes rejected (for the sciences)	
In Tech d.o.o. (Croatia)	16 | 2010–2011	4 | 2010–2016	25 | 2012–2016	level 1 | 2007–
OmniScriptum GmbH & Co. KG[b] (Germany)	20	26	18	–
VDM Verlag Dr Müller*	5 | 2008–2011	3 | 2007–2012	–	level 1 | 2008–2010
LAP Lambert Academic Publishing*	14 | 2009–2011	17 | 2012–2016	16 | 2010–2016	level 0
Südwestdeutscher Verlag*	1 | 2010	–	-	–
Scholars" Press*	–	3 | 2015	2 | 2014	level 0
Palmarium Academic Publishing*	–	1 | 2014	–	–
GlobeEdit*	–	1 | 2015	–	–
Nova Science Publishers, Incorporated (the USA)	9 | 2009–2015	12 | 2006–2016	9 | 2012–2016	level 1 | 2005–2017
Peter Lang (the USA)	10 | 2008–2016	10 | 2007–2016	3 | 2012	level 1 | 2004–
Authors or miscellaneous publishers (Austria, Australia, Estonia, Finland, Germany, Latvia, and Lithuania)	2 | 2009, 2011	9 | 2004–2016	2 | 2008, 2015	–
Studium Press, LLC (the USA)	1 | 2014	–	2 | 2013, 2014	level 0
Begell House Publishers, Incorporated (the USA)	4 | 2005–2010	–	1 |2012	level 1 | 2004–
Herder-Institut e.V. (Germany)	1 | 2015	–	1 |2005	level 0
IGI Global (the USA)	8 | 2011–2016	2 | 2010, 2014	1 | 2013	level 1 | 2007–
Shaker Verlag (Germany)	1 | 2017[d]	–	1 | 2016	level 1 | 2005–
Cambridge Scholars Publishing (the UK)	20 | 2010–2016	4 | 2010–2016	–	level 1 | 2006-2018
Hermann (France)	1 | 2017[d]	1 | 2013	–	level 1 | 2009–

* OmniScriptum imprints presented as they were named in the bibliographic data of books submitted to the assessment in Lithuania.

a The Lithuanian level "prestigious publishers" is equal to level 2 in the Norwegian Register.

b OmniScriptum GmbH & Co. KG (Germany) has the highest values and is the only publisher issuing books under many imprints.

d The status of the publishers was taken from the orders of the Research Council of Lithuania.

I identified sixteen inconsistently assessed publishers and thirteen self-publishers[21] that issued multiple books (either in the sciences or in the social sciences and humanities). This means the same publisher was sometimes assessed by anonymous experts as prestigious, while in other cases, it was assessed as non-prestigious. Selected publishers issued 224 books

[21] Thirteen self-publishers were identified in the GRP using prefixes of the book ISBNs. According to the Lithuanian formal regulations, self-published works do not qualify for submission to metric-based assessments, neither do those having no ISBNs or misleading ISBNs.

submitted for evaluation by the Lithuanian Research Council expert panels. The experts designated ninety-three books as published by prestigious publishers. They also rejected sixty-three books published by the same publishers, thus allocating them to both (the highest and lowest) categories. The remaining sixty-eight books produced by the same publishers were submitted to the not-so-prestigious publisher category (allowed only for books in the social sciences and humanities).

Identifying registrants of ISBNs in the Global Register of Publishers (GRP), quite a striking finding reveals that the publisher listed in a library catalogue (and on the book's copyright page) does not necessarily match the ISBN registrant. For example, the books" copyright pages state that publishers are universities or academic institutions; but factually, these books were issued by individuals or miscellaneous publishers who may have been assigned just one or two ISBNs. In the GRP system, such books are identified as self-published books. It must be pointed out that Lithuanian research assessment policies do not qualify self-published books as proper research outputs. This is why thirteen self-published books were distinguished in the row "Authors or miscellaneous publishers" in Table 1.

One more noteworthy finding was that six separate publishers (compiled in the first column and marked with an asterisk in Table 1) in the GRP were identified as one German-based company OmniScriptum GmbH & Co KG. Nevertheless, these publishers do not exist in the GRP and the ISBN system; they are listed on the OmniScriptum webpage and library catalogues. Even more, two (out of six) Omniscriptum branches in the Lithuanian results— Verlag Dr Müller (VDM) and Lambert Academic Publishing (LAP)— are included in the Beall's List of vanity presses[22], the Lithuanian experts awarded them the prestigious category from 2009 to 2011. Furthermore, LAP's books were rejected as inappropriate and awarded the highest (prestigious) category within the same years.

An in-depth investigation of the disagreements among the Lithuanian experts revealed a pretty complicated situation. In 2009, both panels (in the sciences and the social sciences and humanities) decided that LAP was a prestigious publisher, and book outputs received maximum points. Nevertheless, after a year, in 2010, the panel in the sciences rejected the book outputs issued by LAP as produced by a non-prestigious publisher (and institutions received zero points). At the same time, the panellists in the social sciences and humanities awarded the books issued by LAP the highest category (and institutions received the maximum points). Then, in the assessment of 2011, both panels decided that LAP was a prestigious publisher, and six books submitted in the sciences and the social sciences and humanities received the maximum points again. A turning point occurred in 2012 when the submission of monographs published by LAP doubled. Regrettably for the institutions (which were aware that the experts treated LAP as a prestigious publisher in the preceding year), the experts on both panels decided that LAP was not prestigious anymore. So, book outputs in the sciences were rejected (meaning no points), while those in the social sciences and humanities were awarded level 1 (meaning positive assessment and fewer points).

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[22] The Beall's List of vanity presses. *What is vanity press?* <https:// beallslist.net/vanity-press/> accessed 16 April 2020.

There are more inconsistencies in the experts" decisions. The following example deals with the status of InTech d.o.o. The Lithuanian experts scored maximum points for sixteen outputs (in the sciences) published by InTech d.o.o. over 2010-11. However, from 2012 to 2016, the experts decided that twenty-five books produced by this publisher were inappropriate because a non-prestigious publisher issued them. Thus, these twenty-five were rejected, and institutions did not receive the points (and funding) they expected, even though they had been incentivised to publish with this book producer one year earlier. Nevertheless, Lithuanian institutions received their points for chapters (in four edited volumes published by the same InTech d.o.o.) as outputs in the social sciences and humanities at the lower category (not-so-prestigious publishers) – where any publisher is eligible.

Significant changes in circumstances regarding a publisher's prestige have surrounded the widely known UK-based publisher Cambridge Scholars Publishing (formerly Cambridge Scholars Press Ltd.[23]). It is interesting to note that the Lithuanian experts designated twenty of its titles as being produced by a prestigious publisher from 2010 to 2016. At the same time, four books were classified as issued by a not-so-prestigious one (so institutions received fewer points). In 2018, the Lithuanian experts awarded Cambridge Scholars Publishing the highest level, deeming it a prestigious publisher in the humanities.[24] There is significant controversy around Cambridge Scholars Publishing across countries. In France, when describing the inevitable confusion about misleading value of publishing houses, interviewed researchers mentioned Cambridge Scholars Publishing:

> *'I published there, so I found it quite good, but lately I learnt from English researchers that they consider it their Harmattan [...] Harmattan is not greatly considered by "serious" French researchers" (Williams and Galleron 2016).*

However, in the UK, Cambridge Scholars Publishing was among thirty-nine publishers which had twenty or more books submitted to the Research Excellence Framework across the arts and humanities in 2014 (Tanner 2016). In the UK REF2014, nearly three hundred outputs (authored books, edited books, chapters in books) produced by this publisher were selected as institutional choices of their excellence.[25]

In Norway, Cambridge Scholars Publishing had level 1 status, and it was ninth on the list of top ten publishers, covering 25 per cent of all scholarly book outputs published in international languages in the social sciences and humanities between 2005 and 2009 (Sivertsen and Larsen 2012). However, Cambridge Scholars Publishing received level 0 status in 2019, although Norwegian scholars still publish their works with this publisher, which is confirmed by significant numbers of production points registered in the Norwegian Publication Indicator[26].

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[23] Cambridge Scholars Publishing Ltd in the Companies in the United Kingdom <https://www.companiesintheuk.co.uk/ltd/cambridge-scholars-publishing> accessed 21 July 2024.

[24] The Research Council of Lithuania 31 October 2019 order No V-554, the list of prestigious publishers in the humanities (full data in Annex 1).

[25] REF2014, Research outputs (REF2) <https://webarchive.nationa larchives.gov.uk/20170302140351/> <http://results.ref.ac.uk/Download Submissions/ByForm/REF2> accessed 20 Apr 2020.

[26] Cambridge Scholars Publishing in The Norwegian Register https://kanalregister.hkdir.no/publiseringskanaler/KanalForlagInfo.action?id=19631 accessed 21 July 2024

In the Danish BFI lists, Cambridge Scholars Publishing first appeared in 2011 (BFI lists had no levels for book publishers at that time), then it became a level 1 publisher over 2012-13 and has disappeared from the BFI lists since 2014. In Finland, researchers on panels also assigned Cambridge Scholars Publishing to the basic level 1 status. In the Flemish database (VABB-SHW), this book producer is indicated as a level 0 publisher, having only some ISBN titles peer reviewed.

Another striking instance occurred in the Lithuanian data when a publisher became prestigious in the sciences category within a year. In 2017, the unnamed experts on the sciences panel rejected a monograph published (in 2016) by Germany-based publisher Shaker Verlag on the basis that the publisher was not prestigious. In 2018, the experts on the same sciences panel (we do not know if these were the same anonymous experts) selected Shaker Verlag as a prestigious publisher.[27] This book producer has publisher status "level 1" in Norway, Finland, and Denmark and "level 0" in the Flemish database.

Since 2018, the Research Council of Lithuania has distributed three separate lists of book publishers determined as prestigious in the sciences (nine publishers), the social sciences (eleven publishers)[28], and the humanities (twenty-three publishers) on its website. However, this does not explain if books produced by these prestigious publishers in subsequent years would also receive maximum points—uncertainties for the submitting institutions still exist.

Additionally, the results presented in the last column of Table 1 indicate if the publisher was ranked in the Norwegian Register and if so, the years it happened. Level 0 means that somebody registered the publisher (or the publisher did so); however, they were not assigned a level (the Norwegian Centre for Research Data examines whether the book channel meets the minimum requirements). The sign "–" indicates that nobody has submitted the publisher to the Norwegian Register.

Notably, not a single publisher ranked as prestigious in Lithuania appeared at the Norwegian Register's level 2 (Norway's highest level), and four publishers ranked as prestigious in Lithuania did not attain level 1 (Norway's entry level).

In sum, several cases vividly illustrate that the prestige of publishers relies on the impressions or previous experiences of the scholars who serve on assessment panels. A considerable disagreement has persisted among researchers and experts regarding the prestige of publishers, not only in different countries but even within the same country (i.e. Lithuania). The evidence presented above challenges what may be defined as a prestigious publisher.

In the following section, I analyse whether the national Norwegian and Lithuanian regulations are clear enough to determine the required status of publishers (e.g. academic or prestigious publishers, respectively). If so, scholars could easily follow the rules, and policymakers would

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[27] The Research Council of Lithuania 31 October 2019 order No V-556, the list of prestigious publishers in the sciences (see in Annex 1).

[28] The Research Council of Lithuania 31 October 2019 order No V-555, the list of prestigious publishers in the social sciences https://www.lmt.lt/lt/doclib/grc78rw5k5pk3tyskcpm8bguunhwt323

reach their policy goals—to create an incentive for academics to publish their research with the most prestigious publishers.

4.5. Verifying whether book publishers meet mandatory prerequisites

We reviewed the above-analysed international publishers listed in Table 1 to see whether I could verify that publishers meet *the minimum requirements for entry* into the Norwegian Register and the Lithuanian *formal definition of prestigious publishers* set in the regulations. Making the right decision regarding book publishers is more prominent for scholars in countries approaching metric-based assessment systems (e.g. Norway or Lithuania) than in countries with peer review evaluation (e.g. the UK). For example, if Lithuanian researchers published with the "wrong" publishers, institutions would not earn funding for research (currently, this system is used to allocate forty per cent of the governmental funds for research). Table 2 shows data on publishers anyone could collect from various sources.

The first column shows how transparent and identifiable publishers are (to be discussed in subsection 4.5.1). The middle columns give the minimum prerequisites for inclusion into the Norwegian, Finnish, and Danish rankings of publishing channels (to be discussed in subsection 4.5.2). The last section offers insight into how the publishers fit the Lithuanian explanation of "prestige" (to be addressed in subsection 4.5.3). To be exact, I assumed that if publishers are international, they must provide information about the distribution of their books, policies, and authors on their websites in internationally understandable languages (see column 10).

4.5.1. Misdemeanours in the appearance of publishers

To interrogate the data further, I chose the Principles of Transparency and Best Practice in Scholarly Publishing developed by well-known scholarly organisations[29] as the primary standard. As an example, in a study on scholarly journals" compliance with this standard (Choi, Choi, and Kim 2019), the sixteen principles of the standard were sub-divided into 33 items in four different categories: (1) basic journal information, (2) publication ethics information, (3) copyright and archiving information, (4) profit model information. For the analysis presented in this sub-section, I adjusted the items proposed in the category "basic journal information."

ISBNs and publishers. The regulations mandate ISBNs for book outputs in Norway, Finland, Denmark, Flanders, and Lithuania. According to the International ISBN Agency, it is always the book publisher who should apply for the ISBN[30].

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[29] Principles of Transparency and Best Practice in Scholarly Publishing. The third version published on 15 January 2018 <http://wame.org/principles-of-transparency-and-best-practice-inscholarly-publishing> accessed 21 July 2024.

[30] Who should apply for ISBN? International ISBN Agency <https://www.isbn-international.org/content/what-isbn> accessed 21 July 2024.

Table 2. Publishers which Lithuanian panel experts awarded the highest and at least one other category compared with their ranks in the metric-based assessments by various other countries (data as of 19 April 2019)

The transparency of the publishers	The minimum requirements for entry to the national registries, and the levels publishers awarded by 2019							The Lithuanian description of prestigious publishers	
'Registrant name" in the Global Register of Publishers | "Publisher" on the website (if different) | a country of ISBNs, declared, year established	Policy on peer review of books	Editorial or Advisory Board	Author-ship	Publisher's level in the national system in				Publish book series or journals	Languages of the content provided on the website
				Norway	Finland	Denmark	Flanders		
1	2	3	4	5	6	7	8	9	10
In Tech d.o.o. (Croatia, 2007) = IntechOpen (the UK, 2017)	**yes** | COPE*	**yes**	Int'l	level 1 2007–	level 0	–	–	book series	English
OmniScriptum GmbH & Co. KG (18 academic brands, Germany, 2002)									
VDM Verlag	–	–	Int'l	level 1 2008-10**	level 1 2012-14	–	–	?	English
LAP Lambert Academic Publishing	–	–	Int'l	level 0	level 0	–	–	?	English
Nova Science Publishers**** (the USA, 1985)	**yes**	? *****	Int'l	level 1 2005-17	level 1 2012-19	level 1*** 2008-19	ISBN-selection	journals, book series	English
Peter Lang (the USA, Switzerland, 1970)	**yes**	–	Int'l	level 1 2004-19	level 1 2012-19	level 1 2008-19	ISBN-selection	journals, book series	English
Studium Press (the USA, India, 1980)	–	–	?	level 0	–	–	–	book series	English
Begell House (the USA, 1991)	–	?	Int'l	level 1 2004-19	level 1 2012–	level 1 2008-19	–	journals, book series	English, six more languages
Herder-Institut (Germany, 1990)	–	–	?	level 0	level 1 2014-19	–	–	journal, book series	German, English
IGI Global**** (the USA, 1998)	**yes** | COPE	?	Int'l	level 1 2007-19	level 1 2012-15 and 2018-19	level 1 2008-19	to employ peer review for all books	journal, book series	English, Chinese
Shaker Verlag (Germany, 1986)	–	–	Int'l	level 1 2005-19	level 1 2012-19	level 1 2008-19	ISBN-selection	book series	German, English, Dutch
Cambridge Scholars Publishing (the UK, 2001)	–	?	Int'l	level 1 2006-18	level 1 2012-19	level 1 2011-13	ISBN-selection	book series	English
Hermann (France, 1876)	–	–	?	level 1 2009-19	level 1 2015-19	level 1 2008-19	–	book series	French

* Publisher is a member of the Committee on Publication Ethics (COPE).

** as VDM Verlag Dr Müller Aktiengesellschaft & Co. KG. in the Norwegian Register. VDM Verlag was relaunched as OmniScriptum in 2013.

*** The BFI list of publishers in Denmark had no levels for book publishers from 2008 to 2010. Level 1 and level 2 for book publishers were launched in 2012.

**** Publishers included into the Beall's List of vanity presses https://beallslist.net/vanity-press/ assessed 9 June 2020.

***** "?" means that I was not able to find information on authorship or about an editorial/advisory board.

Thus, I examined the transparency of publishers, comparing the "registrant name" in the Global Register of Publishers (GRP) with the "publisher" as it appears on the website it owns. I supposed that the publishers are transparent for authors, readers, and evaluators when this information matches.

The data show that two (out of eleven) publishers have a different presence on their web pages, and the GRP: In Tech d.o.o. (named IntechOpen on its website) and OmniScriptum (which has numerous brands recognised on its website).

The publisher In Tech d.o.o. would look inconsistent for some researchers and the panel experts who assess its book outputs because searches in the GRP (by the prefix "978-953-307" of Lithuanian outputs" ISBNs) produce the publisher In Tech d.o.o. based in Croatia. However, the URL (provided on the GRP) directs users to the IntechOpen website [31], which declares only its headquarters in the UK ('About IntechOpen'). Nevertheless, the "Contacts" page reveals that IntechOpen has two offices: In Tech d.o.o. in Croatia (registered in 2007[32]) and IntechOpen Limited in the UK (registered in 2017[33]). Despite its achievements and membership of COPE and OASPA (both being developers of the principles of transparency), IntechOpen stands as a level 1 publisher in Norway, a level 0 in Finland, and has no level in Denmark and Flanders.

Researchers and assessment panel experts would have more doubts regarding the publisher OmniScriptum. In the Lithuanian dataset, OmniScriptum consists of six imprints. However, only two of them (those awarded the prestigious category in Lithuania and listed in the Norwegian Register) are included in Table 2. At its origins, it was VDM Verlag, launched in 2002 and relaunched as "OmniScriptum" in 2013. Lambert Academic Publishing (LAP) is another brand of OmniScriptum, about which searches on the internet reveal claims it is a predator, vanity press, or at least questionable (Broz and Stöckelová 2018).

Currently, OmniScriptum openly declares its policies and business models on its website:

> *'Yes, we are aware of the criticism towards OmniScriptum that can be found on the web. […] Our company has changed tremendously in the last years. We have changed our business (no more Wikipedia since ages), we have changed our publishing terms, we have even changed our name. Just to clarify – we are OmniScriptum! […] Meanwhile our publishing group incorporates more than 45 imprints'.* [34]

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[31] About IntechOpen <https://www.intechopen.com/about-intechopen> accessed on 21 July 2024.

[32] Fininfo <https://www.fininfo.hr/Poduzece/Pregled/in-tech/Detaljno/107379> accessed on 21 July 2024.

[33] Intechopen in the Companies in the United Kingdom <https://www.companiesintheuk.co.uk/ltd/intechopen> accessed on 21 July 2024.

[34] OmniScriptum—diversity and innovation <https://www.omnis criptum.com/>> accessed on 21 July 2024.

4.5.2. Compliance with necessary prerequisites

The criteria for including new scientific publication channels into the Norwegian Register[35] are like those required in Finland and Denmark. Book publishers should have (1) established procedures for external peer review and (2) an academic editorial board (or an equivalent) primarily consisting of academics; also, they should (3) issue books authored by an international or at least a national research community.

The first prerequisite—*necessary procedures for external peer review in book publishing*—is essential, as it usually takes place in journal publishing. However, independent academic book publishers operate differently (Derricourt 2012); this is why I looked for the policies on peer review practices on the publishers' websites (Table 2, column 2). I found that only four publishers make publicly available their statements or descriptions about their peer review procedures, the main requirement for publishers accepted for the entry level into these four publisher assessment systems.

The second prerequisite—*a required advisory board of academics*—is declared as a list of people only on the IntechOpen website (Table 2, column 3). The symbol "–" means that I did not find any advisory board on the publisher's website. The sign "?" means that publishers do not publish who is on their advisory board; instead, they list authors, editors, and reviewers (in some cases) in one general list (e.g. Nova Science Publishers, Begell House). Alternatively, Cambridge Scholars Publishing lists 130 boards in the physical sciences and 102 boards in the social sciences on its website. It is challenging to assess the presence of an editorial or advisory board, or scientific committee on the websites of book publishers because of diverse practices book publishers have in place.

The third prerequisite—*an international or at least a national authorship*—is required from book publishers for entry and standing at the minimum level 1 (Table 2, column 4). According to the Norwegian Register requirement, international publishers should have less than two thirds of their authors from the same country, while national authorship means "no single institution is responsible for more than two-thirds of the publications in the channel over time'.

Because I did not find a single piece of advice on the source of calculation in the NPI website, I just checked the publishers' websites to see their online book catalogues or statements on their authorship. For example, IntechOpen states:

> *'Our community ranges from key opinion leaders of the international academic and scientific community, including Nobel Laureates and the top 1% of the world's most cited authors, to the next up-and-coming generation of scientists looking to make their mark." https://www.intechopen.com/about-intechopen*

The symbol "?" means that there were no authorship statistics or relevant information on the publisher's website. For example, the Herder Institute has no online book catalogue, statement, or lists of authors or editors. However, I found that it is a unit of the Leibniz Association (the Leibniz-Gemeinschaft), having 96 non-university research institutes. Thus, I

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[35] In the Norwegian Register, the procedures for processing new submissions include: 'Note that the submitter must be a person, not the journal/series/publisher or an organization' <https://kanalregister.hkdir.no/publiseringskanaler/OmProsedyrer> accessed 21 July 2024.

could suppose that the Herder Institute would have at least a national authorship and meet this entry-level requirement. Nevertheless, I am not sure if I could make such an assumption about the fulfilment of this mandated criterion. So, it is challenging for assessors of book publishers to identify the level of publishers' authorship.

Additionally, I collected data on *the levels the publishers gained in the national systems* to compare our findings on the fulfilment of compulsory requirements with the publishers' levels (Table 2, columns 5-8). There are some disparities in the ranks of IntechOpen and the Herder Institute in their rankings in Norway and Finland, and it is not clear if these publishers had actually been considered and had not received any level in Denmark. However, LAP and Studium Press were not approved unanimously in all countries. The results suggest that some publishers (e.g. Begell House, Cambridge Scholars Publishing, Hermann, or Shaker Verlag) have no verifiable mandatory prerequisites in place.

Unfortunately, in some cases, I could not find a straightforward way to verify if the book publisher complies with the minimum prerequisites; thus, transparent verification of compliance with the requirements is impossible.

Notwithstanding, some publishers without exceptionally high results in other countries were designated as prestigious in Lithuania, prompting re-examine the formal national definition of prestigious publishers.

4.5.3. Adherence to the formal Lithuanian definition

The Lithuanian formal research assessment regulations define prestigious publishers as publishers that continually (1) release publications authored by national and international researchers and (2) distribute their products in many countries. Moreover, prestigious publishers are classified as such when they (3) issue globally recognised journals and book series as well as (4) provide sufficient information about these achievements on their websites.[36]

The first feature—*international authorship*—is a similar prerequisite for level 2 or level 3 publishers in the above-discussed national rankings (in Norway, Denmark, and Finland), which define this as less than two thirds of authors from the same country (Table 2, column 2). Nonetheless, Lithuanian policymakers do not specify that authorship should be "international'.

The second attribute—*distribution of books in many countries*—does not make publishers unique because currently, many publishers (and all I investigated in this study) distribute books they produce through their own websites, Amazon, or other vendors. Hence, I did not include this piece of additional information in the table.

The third quality—*issue globally recognised journals and series of books*—is somewhat ambiguous. It seems strange to judge book publishers according to their journal activities and decide whether their journals and book series are globally recognised (because the formal

[36] The Ministry of Education and Science of the Republic of Lithuania, 4 October 2017 order No V-747 (Valid since 1 November 2017) <https://www.e-tar.lt/portal/lt/legalAct/69270ef0a8d411e78a4c904b1 afa0332> accessed 21 July 2024.

regulation does not explain how to measure the level of recognition). Likewise, uncertainty is left regarding publishers which issue only book series (and no journals) as to whether such publishers can be prestigious or not. Therefore, the results compiled in column 9 (Table 2) suggest that producing only book series (and no journals) would be enough for publishers to be awarded the prestigious rank.

Notably, LAP (an imprint of OmniScriptum) announces on its website that its main targets are theses and dissertations (and I did not recognise series on its website). Nonetheless, the experts scored books they produced as those published by prestigious publishers, and with such a decision, they have created incentives for researchers to publish with this publisher.

The concluding requirement—*provide sufficient information about all achievements on their website*s—seems rational because achievements (if the formal regulations specify them) would help identify prestigious publishers. However, many controversial (or questionable) publishers have such perfect-looking websites that even experienced scholars do not recognise their failings.

Therefore, I decided that if international authorship is a mandatory feature, it would be reasonable to check whether the publishers have their policies and other content on their websites in English. Thus, any potential author could become acquainted with information provided on the website before submitting a manuscript, or the experts could ascertain that the publisher fits the definition of a prestigious publisher. Column 9 in Table 2 shows the languages of the content provided on the publisher's website. Only Hermann, the oldest publisher on the list, would not meet the fourth criterion because its webpage is only in French, so it is difficult to learn more about its achievements (and Google translate did not help in this case). Nevertheless, the Lithuanian experts designated Hermann as a prestigious publisher.

Given all the circumstances mentioned above, it is not surprising that the Lithuanian experts" panel has no consensus on the "prestige" of book publishers (presented in Table 1). Even the official national regulations do not help to differentiate the prestigious from the not-so-prestigious publishers.

4.6. Discussion and conclusions

The evaluation of book outputs is debated at length in research papers studying national research assessment systems or examining indicators for the assessment of books.

In countries performing national research assessment exercises that rely on qualitative peer review assessment, researchers debate the benefits of a metrics-based approach versus a peer review approach (Allen and Heath 2013) or look for new ways to assess books (Basso et al. 2017). Meanwhile, UK policymakers, exploring ways to extend the possibilities for evaluating books, have introduced some pioneering prerequisites, such as open access for monographs, which have already been widely discussed (Crossick 2015; Lockett 2018).

At the same time, researchers in countries that use quantitative assessment systems express concerns about the effects of metrics-based research assessment on research practice in general. For instance, some institutions reward individual researchers using metrics that were

originally intended to be used only at the institutional level (Aagaard 2015; Hammarfelt and de Rijcke 2015). Moreover, Mouritzen and Opstrup (Mouritzen and Opstrup 2020) reveal components of the Danish Bibliometric Research Indicator leading to game the system, and Rowlands and Wright (Rowlands and Wright 2021) investigate the effects of such research assessment on research practice in Denmark. In 2021, the Bibliometric Research Indicator (BFI) was terminated.[37] However, there seems to be relatively little debate about the underlying causes and consequences of incentive structures in countries that employ publishers' rankings to assess books.

Our findings show that no matter whether countries employ qualitative (peer review) or quantitative (metrics-based) research assessment, experts evaluate book outputs and decide on the quality of books. However, the UK policies urge experts do not consider book publisher standing. This is opposite in book publisher rankings, where empowered researchers select the most prestigious book publishers from all publishers that are considered meeting basic entry requirements; so, institutions receive state funding only by book publishers, but not by the quality of individual books.

As our examination of various national assessment systems reveals, publishers' rankings rely on four mandatory prerequisites—ISBN prefix, external peer review procedures, a scientific publishing programme or advisory board, and national or international authorship. However, as our findings show, rankings' descriptions do not disclose the details of their approval procedures, nor do book publishers make the information about peer review publicly available. Hence, there is little transparency in determining whether publishers meet the minimum requirements for entry into a national register.

Furthermore, our results show that experts in different countries may have contradictory opinions on the prestige of a publisher. The same publisher may be ranked differently in the Danish, Finnish, Norwegian, and Lithuanian registers. The results show that the same publisher in Lithuania may be categorised as prestigious in one year and as satisfactory or even ineligible in the next year. These findings indicate that it is difficult to reach a common understanding of what it means to be a prestigious publisher and that there is no consensus on international and prestigious publishers. This raises doubts about the outcomes of assessments of books based on a judgement about their publisher.

It strikes us that neither quantitative nor qualitative assessment approaches stress the importance of the dissemination of research published in books. The rankings of book publishers focus on the content quality expected from publishers maintaining peer-review prior to book publication. They do not assess how publishers contribute to disseminating academic research and scholarship (e.g. high-quality metadata). Even though the Lithuanian regulations mention dissemination as a feature of prestigious publishers, they do not explain or specify what it means or requires.

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[37] In 2021, a new political agreement was finalised. With this agreement the Bibliometric Research Indicator (BFI) was terminated. The steering committee, BFI commission, and research expert groups ceased to exist as of December 3rd, 2021. All activities related to BFI were discontinued at the same time <https://medarbejdere.au.dk/en/pure/bfi> accessed 11 July 2024.

Future research may focus on developing improved approaches for assessing books. Our suggestion would be to start that there are more roles of book publishers which are significant for communication between researchers: (1) quality control (e.g. peer-review, copyediting); (2) production (e.g. print runs, digital format, editions); (3) dissemination and archiving (e.g. metadata, digital formats, and long term digital preservation); (4) marketing (e.g. book reviews, social media); and other roles (Dagienė and Li 2021; European Commission 2019a).

Publishers may decide how much they want to offer in each area mentioned above. However, they need to be transparent about the services delivered at each stage for every book. Presumably, different publishers will make different choices in that respect. If publishers are transparent and show what they offer in terms of quality control, dissemination, and other services, research assessment systems can use this information. In an ideal situation, publishers should provide information at the level of individual books, eliminating the need to rely on general information about publishers.

The literature lacks studies on book metadata, transparency of editorial and peer review practices, publisher services, and imprints in book publishing. Researchers should consider these factors from a research assessment perspective and take a more detailed approach to understanding the practicalities in book publishing. Another direction for future research is understanding why different countries take different approaches to evaluate book outputs. Understanding country differences can help explain why some countries prioritise Open Access for books (Crossick, 2015), while others focus on a global register of publishers[38].

[38] Academic Book Publishers (ABP): a global and multilingual register <https://enressh.eu/wp-content/uploads/2019/08/Academic-Book-Publishers-ABP-A-global-and-interactive-register.pdf> accessed 11 July 2024.

Chapter 5.
The challenge of assessing academic books: The UK and Lithuanian cases through the ISBN lens

This chapter based on:

Dagienė, E. (2024). The challenge of assessing academic books: The UK and Lithuanian cases through the ISBN lens. Quantitative Science Studies, 5(1), 98–127. https://doi.org/10.1162/qss_a_00284

5.1. Introduction

Assessing academic books is a major challenge for countries with performance-based research funding systems or national research assessment exercises. The limited availability of information to support the assessment of books is particularly challenging. Despite a substantial body of research on evaluating books and ranking their publishers, there is a scarcity of studies examining how the actual publishers of books submitted to research assessment exercises can be identified and how their activities can be determined. In this paper, I study the use of the ISBN Manual and the Global Register of Publishers to obtain this information. My focus is on books submitted to the research assessment systems in Lithuania and the United Kingdom from 2008 to 2020.

Assessment of books in Lithuania and the United Kingdom

Policymakers in some countries assume that a prestigious publisher guarantees higher research quality, so they tie publishers' status to financial incentives (Dagienė 2023a). Sometimes, decisions about what counts as "prestigious" are made along geographic lines: Lithuanian policymakers, for example, believe domestic book publishers do not deserve the highest rank, so only foreign publishers guarantee two- or threefold funding points. Such incentives have led Lithuanian researchers to seek out foreign book publishers (Dagienė et al. 2019), and, in the end, some questionable foreign publishers have been granted prestigious positions in Lithuania. Furthermore, according to national policies, books self-published locally are not eligible for research assessment and are being rejected as submitted outputs, even as some books self-published abroad receive maximum funding. Additionally, only specific genres—not always clearly defined—are eligible for research assessment in Lithuania; an analogous situation was identified in Italy, where Basili and Lanzillo (Basili and Lanzillo 2018) stressed the need to classify research products.

In contrast to Lithuanian practices, the UK Research Excellence Framework (REF) guidelines instructed evaluators to be neutral with respect to the standing of book publishers. Even so, institutions and departments insisted that researchers publish with more established and reputable academic publishers and university presses (Deegan 2017). Instead of publisher prestige, research policymakers in the United Kingdom increasingly focus on or even require open access to scholarly outputs (Hill 2018). This requirement has sparked an ongoing debate around open access in anticipation of future policy changes (Ayris et al. 2014; Collins, Milloy, and Stone 2015; Crossick 2015; Deegan 2017; Finch 2012; Jubb 2017; Universities UK Open Access and Monographs Group 2019; Vincent and Wickham 2013). It was expected that UK universities would lead the implementation of open access to books, as the role of universities in scholarly book publishing has been continually discussed over the decades (Esposito and Barch 2017; Hahn 2008; Thatcher 2007). According to some researchers, university publishing became more active and transformed significantly not only because of technological change (Bonn and Furlough 2015) but also because for-profit trade publishers were not interested in every scientific work (Sisättö, Mäki et al., 2012). Still, only a few university presses in the United Kingdom can compete effectively with those publishers that are part of international media conglomerates (Fyfe et al. 2017).

Challenges in identifying book publishers

In the changing book publishing landscape, reputational capital still matters for scholars and established publishers alike. For scholars, books produced by elite publishers lead to higher chances of promotions and awards, even though the academic prestige economy creates perverse incentives (Collyer 2018; Fyfe et al. 2017; Nosek and Bar-Anan 2012). Despite this, the brand of the publisher remains a proxy for quality within academia (Crossick 2015). For publishers, esteemed "trademarks" carry their own intrinsic value. Although newcomers strive to meet expectations and establish their reputation within academia, reputable publishers often opt to acquire well-known brands rather than starting new publishing houses from scratch (Goodson, Dillman, and Hira 1999).

Crossick (Crossick 2015) noted that in 2013, the four leading academic publishers released twice as many monographs as they did in 2004. He emphasized that this growth was entirely organic and not the result of acquisitions. It is worth noting that these four publishers were asked to provide the numbers of books they published. Interestingly, the same publishers were recognized in the research on the oligopoly of publishers of peer-reviewed journals (Larivière et al. 2015). In fact, identifying publishers and their actual titles using bibliographic data of books presents a significant challenge due to the numerous brands (or imprints) that publishers use to attract authors and readers, as well as the mergers and acquisitions within the publishing industry.

Several studies have underscored the challenges in identifying book publishers due to events such as mergers, consolidations, and closures. In the analysis of arts and humanities research outputs submitted to REF2014, Tanner (Tanner 2016) found that 46% of the submitted books were published by the top 10 unique publishers. In this context, "unique" refers to publishers that were not repeated in the REF data set and were operational in 2014. However, the publishing landscape underwent significant changes in 2015, during the preparation of Tanner's report. For instance, Informa, the parent company of the academic publishing group Taylor & Francis (and owner of Routledge, ranked fourth in Tanner's top 10), acquired Ashgate Publishing[39,40], (ranked fifth). Additionally, Springer Nature completed its merger with Palgrave Macmillan[41] (ranked second). If these changes had been taken into account, the list of top publishers would have looked different. In another study analysing the concentration of publishers for books submitted to the Flemish database, Guns (Guns 2018) discovered that the top 10 publishers accounted for 28.7% of all books. Guns assigned a unique publisher name to each combination of ISBN prefix and year, utilizing various sources that overview acquisitions and imprints. However, he acknowledged that if divisions and imprints were treated as separate entities, different patterns might emerge, especially at the disciplinary level.

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[39] Save Ashgate Publishing. Progressive Geographies <https://progressivegeographies.com/2015/11/20/save-ashgate-publishing> accessed on 7 November 2022.

[40] Springer Nature merges Major Reference Works portfolios of Palgrave Macmillan and Springer, October 12, 2016. Springer. <https://www.springer.com/us/about-springer/media/press-releases/corporate/springer-nature-merges-major-reference-works-portfolios-of-palgrave-macmillan-and-springer-/10862304> accessed on 7 November 2022.

[41] Ashgate acquired by Informa (Taylor & Francis). Ashgate Publishing Blog. <https://ashgatepublishing.wordpress.com/2015/08/03/ashgate-acquired-by-informa> accessed on 7 November 2022.

There is a clear need for further exploration of data sources on book publishers to better understand and monitor the processes of publisher oligopoly/concentration. Currently, scientometricians lack evidence to determine whether non-English speaking or smaller countries are experiencing an "oligopoly" of book publishers. This area certainly warrants more in-depth research.

Over the decades, the scientometric community has sought ways to assess scholarly books, discovering various sources for bibliographic information (Halevi, Nicolas, and Bar-Ilan 2016; Torres-Salinas and Moed 2009), and testing book metrics (White et al. 2009; Zhu et al. 2020). Many researchers analysing book evaluation practices have noticed that ISBNs are mandated for research outputs globally. However, those who have conducted research on book metrics based on citations or publisher titles listed in bibliographies have questioned the usefulness of ISBNs. They argue that ISBNs are not suitable for tracking citations or identifying publishers (Williams et al. 2018; Zuccala et al. 2018; Zuccala and Cornacchia 2016). Those interested in book publishers have suggested keeping the publisher names as recorded in library catalogues (Sīle et al. 2021; Zuccala et al. 2015); that is, as provided by the publishers themselves on book copyright pages. It has been noted, however, that this option would lead to a dozen ways of recording even well-known publisher names (Guns 2018; Tanner 2016). No means of identifying book publishers using any existing identifier has yet been proposed.

The ISBN Manual and the Global Register of Publishers

So far, no study seems to have systematically analysed the International Standard Book Numbers (ISBN) Manual itself or empirically explored the ISBN metadata compiled in the Global Register of Publishers (GRP). The ISBN Manual is a practical guide to the key regulations of the ISBN Standard for users within the book publishing industry; as such, it mirrors actual book publishing practice. The GRP provides metadata relating to publishers worldwide, including the ISBN blocks that have been assigned to them. Both sources supply firsthand information about ISBNs for investigating book publishing processes. These sources were helpful in exploring the practicalities of assessing book publishers in different countries (Dagienė 2023a) and cleaning the data of books submitted for research assessment in Lithuania (Dagienė et al. 2019) and to the Research Excellence Frameworks in the United Kingdom (Dagienė and Li 2021).

Research questions

To further inform book assessment practices in Lithuania, the United Kingdom, and other countries, I will address the following research questions:

RQ 1: Using the ISBN Manual and the GRP, is it possible to determine the genre of a book?

RQ 2: Using the ISBN Manual and the GRP, is it possible to determine the publisher of a book and the role the publisher has played in producing the book?

RQ 3: Can the GRP be used to determine the primary activities of book publishers? This may help to determine with whom researchers publish their works: universities, academic

publishers, or other actors such as libraries, research institutions, or companies providing publishing services.

RQ 4: Can the GRP be used to develop an in-depth understanding of researchers' book publishing practices? This may help to establish book assessment criteria suitable for national use.

This paper is organized as follows. Section 5.2 overviews data sources, ISBN prefixes as elements used to enrich metadata, and primary activities of book publishers for the purpose of the subsequent analysis. To address the first research question, Section 5.3 investigates how books and their genres are represented in the ISBN Manual. To address the second and third research questions, Section 5.4 studies the types of publishers and their roles in book publishing as defined in the ISBN Manual, illustrating the considerable complexities related to imprints, mergers, and acquisitions. The bibliometric analysis presented in Section 5.5 answers the fourth research question by exploring the GRP metadata to identify book publishing practices in the United Kingdom and Lithuania. This section shows the top publishers of books produced by researchers in the United Kingdom and Lithuania, the number of books per publisher, the primary activities of ISBN registrants, and the countries in which publishers are based. Finally, Section 5.6 summarizes the findings, draws conclusions, and discusses implications for research assessment practices.

5.2. Research design and data compilation

A mixed-methods approach was taken to answer the research questions, combining a qualitative analysis and a bibliometric analysis.

In the qualitative analysis, I sought to determine three related phenomena: the genre of a book, the publisher of a book, and the roles a publisher plays in producing a book, which emerged from the analysis of book evaluation practicalities (Dagienė 2023a). I analysed the seventh edition of the ISBN Users' Manual and the corresponding Frequently Asked Questions. Both documents are freely available on the International ISBN Agency website[42] as day-to-day instructions or sets of practical rules for national ISBN agencies and publishers across the globe. I also communicated with Stella Griffiths, the executive director of the International ISBN Agency, who thoroughly answered questions that arose while analysing the documents and exploring the empirical data.

Previous research (Dagienė 2023a) revealed that publishers in the ISBN system could be identified by a publisher prefix extracted from an ISBN comprising five elements (Figure 1). The first three elements—GS1, registration group, and registrant—identify a publishing entity (a particular publisher, its imprint, or any other company or individual) who assigned the ISBN of a book. Thus, publisher prefixes were used to identify the formal publishers of the books submitted to research assessment systems.

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[42] ISBN Users' Manual. International ISBN Agency <https://www.isbn-international.org/content/isbn-users-manual/29> accessed on 26 January 2023.

Figure 1. Structure of an ISBN, showing publisher prefix used to recognize the registrant of the ISBN.

I also performed a bibliometric analysis, in which I examined two research assessment systems: the Research Excellence Framework (REF) in the United Kingdom and the annual quantitative research assessment exercise in Lithuania. In both systems, books are evaluated among other research outputs to inform the allocation of public funding for university research. Both book assessment systems rely on expert assessment, but they do so differently. In the United Kingdom, experts are requested to provide an expert assessment of the scientific content of the submitted books and not to pay attention to the publisher's standing. In contrast, Lithuanian experts are requested to determine the prestige of the publishers of the submitted books. Lithuania has been using a metric-based approach to book assessment for three decades. Here, the prominence of the publisher, as determined by the experts, determines the funding scores the institutions receive.

The REF system has the unique feature that data is made openly available for the two most recent editions of the framework: REF2014 and REF2021[43]. The Research Council of Lithuania likewise provided book ISBNs submitted between 2008 and 2020 for research purposes. Thus, the ISBNs from REF2021 and Lithuanian data were added to data sets explored in a previous study (Dagienė and Li 2021). The distribution of ISBNs submitted as authored books and chapters in edited volumes from 2008 to 2020 is presented for each country in Figure 2.

[43] REF 2021 submission system validation rules. Research Excellence Framework. <https://www.ref.ac.uk/media/1723/submissions-system-validation-documentation-for-ref2021-feb2021.pdf> accessed on 23 October 2022.

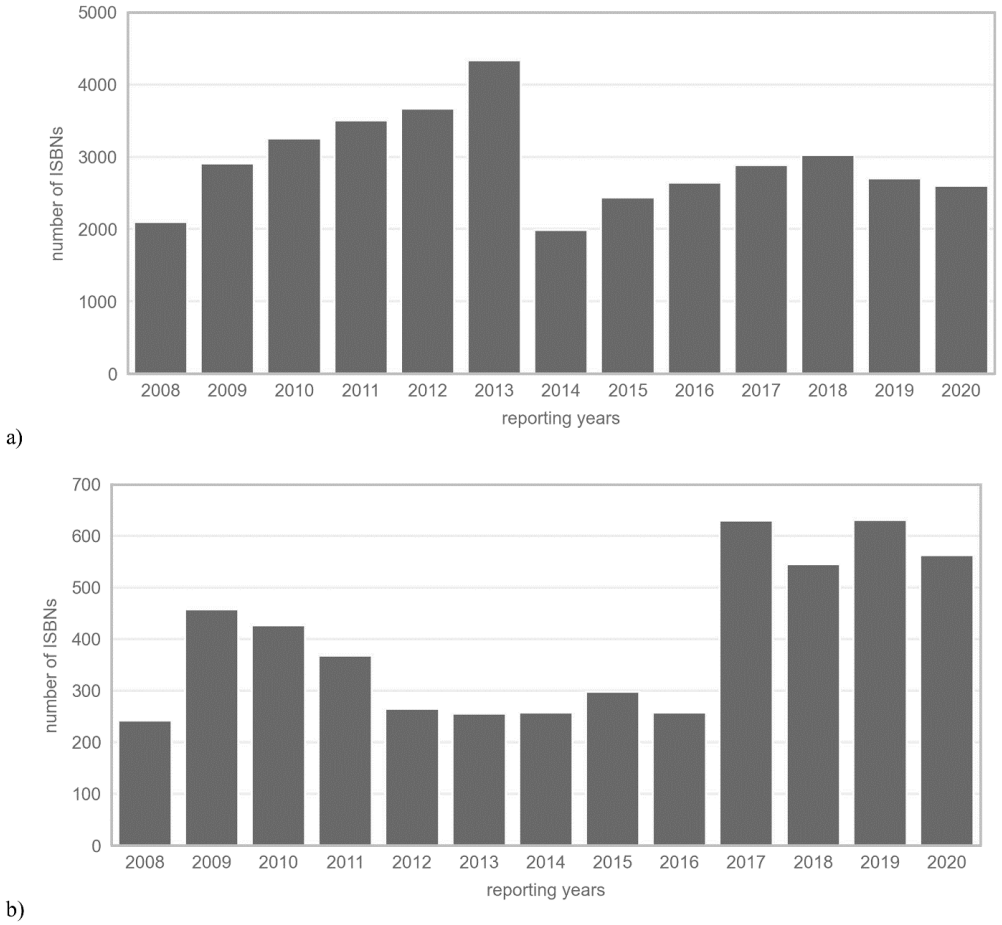

Figure 2. Number of books submitted to the research assessment systems in (a) the United Kingdom and (b) Lithuania by publication year.

5.2.1. Data gathering and processing

The initial empirical data contained valid ISBN codes extracted from the UK (38,050 ISBNs) and Lithuanian (5,199 ISBNs) data sets, along with years of publication and publishers' names manually added by institutions in the submission stage. In the next step, additional metadata were gathered from the Global Register of Publishers[44] (GRP). This freely available registry is maintained by the International ISBN Agency; formally, it is the primary source by which to recognize the registrants of book ISBNs. It is worth emphasizing that the GRP provides book publishers' names under "registrant name," along with other metadata related to the book publisher as identified by its registrant name or ISBN prefix (Figure 3).

[44] Global Register of Publishers. International ISBN Agency <https://grp.isbn-international.org> accessed on18 January 2023.

Figure 3. ISBN metadata available on the GRP website.

Using publisher prefixes extracted from the ISBNs in the initial data sets, the names of all registrants were gathered from the GRP employing the Selenium package in Python alongside other pieces of available metadata. The initial data was enriched with registrant names (often just names of publisher imprints), URLs, business contacts, and the country in which a particular ISBN was registered.

5.2.2. Constructing "unified titles" of publishers

A publisher might utilize many prefixes and brands. As a starting point to unify publisher names, I chose prefixes in the GRP metadata field "ISBN Prefix." Different registrant names owned by the same parent organization were identified by prefixes repeatedly appearing in the metadata field "ISBN Prefix." Figure 4 shows how the prefixes 978-0-19 and 978-0-511 recur in the "ISBN Prefix" sets of different well-known academic publishers' brands. In fact, both of these publishers have more prefixes registered in other countries, but only prefixes extracted from the initial data sets were considered.

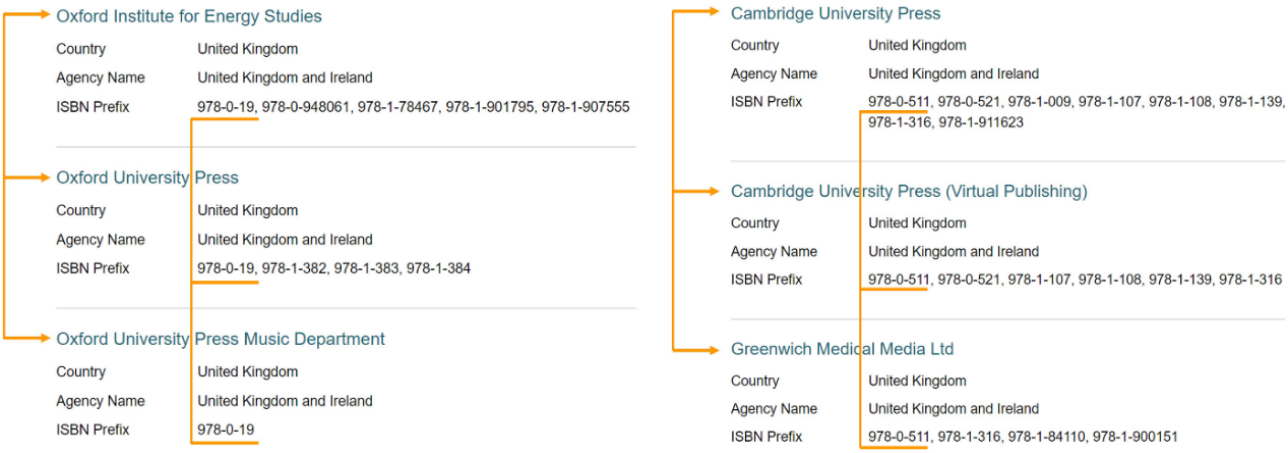

Figure 4. The same prefixes appear in different registrants' metadata in the GRP: the prefix 978-0-19 links imprints of Oxford University Press, and 978-0-511 links brands of Cambridge University Press.

Having extracted all prefixes and their registrant names, I used Python code to compile intermediate results, or "GRP names," indicating all registrant names linked to the same prefix. Figure 5 shows the GRP name sets for the top 10 prefixes by number of ISBNs assigned; these GRP titles, in turn, determined the final piece of data: the "unified title" or parent publisher.

prefixes	GRP titles	unified title
978-0-19	Clarendon Press; Early English Text Society; German Historical Institute London; IRL Press at Oxford University Press; Oxford Institute for Energy Studies; Oxford University Press; Oxford University Press Music Department	Oxford University Press
978-0-230	Baby Campbell; Campbell Books Ltd; Environment Press (an imprint of Macmillan Press Ltd); Macmillan; Macmillan Audio Books; Macmillan Caribbean; Macmillan Children's Books; Macmillan Digital Audio; Macmillan Education; Macmillan Education UK; Macmillan English Campus; Macmillan General Books; Macmillan Journals Ltd; Macmillan London Ltd; Macmillan New Writing; Macmillan Press; Macmillan Publishers Limited; Macmillan Reference Ltd; Mantle; Palgrave Macmillan; Palgrave Pivot; Pan Books; Pan Macmillan; Papermac; Picador; Piccolo; Red Globe Press; Sidgwick & Jackson Ltd; TFPL Multimedia; Tor; Young Picador	Springer Nature
978-0-415	ABP (UK) Ltd; Architectural Press; Ashgate Publishing Limited; Birkbeck Law Press; Brunner-Routledge; CRC Press; David Fulton Publishers Ltd; Earthscan Ltd; Estates Gazette; Focal Press; Frank Cass Publishers; Gestalt Press; Gower Publishing Ltd; Informa Healthcare; Informa Law; Psychology Press Ltd; Routledge; Routledge Academic; Routledge Falmer; Routledge India; RoutledgeCurzon; Spon Press; Taylor & Francis Ltd; UCL Press	Informa (Taylor & Francis)
978-0-521	Cambridge University Press; Cambridge University Press (Virtual Publishing)	Cambridge University Press
978-0-7190	Chetham Society; Manchester University Press	Manchester University Press
978-1-107	Cambridge University Press; Cambridge University Press (Virtual Publishing)	Cambridge University Press
978-1-137	Macmillan Education UK; Palgrave; Palgrave Macmillan; Palgrave Pivot; Red Globe Press	Springer Nature
978-1-138	Ashgate Publishing Limited; Birkbeck Law Press; CRC Press; David Fulton Publishers Ltd; Focal Press; Gestalt Press; Gower Publishing Ltd; Informa Healthcare; Psychology Press Ltd; Routledge; Routledge Academic; Routledge Cavendish; Routledge Falmer; Routledge India; Spon Press; Taylor & Francis Ltd	Informa (Taylor & Francis)
978-3-319	Springer Nature Switzerland AG	Springer Nature
978-90-04	Koninklijke Brill N.V.	Brill

Figure 5. Top 10 prefixes by number of books in the REF ISBNs, ISBN registrant titles linked to these prefixes in the GRP, and unified titles (parent publisher) attributed to these prefixes.

Not all prefixes are connected with their parent publishers in the GRP metadata. For some registrant names, a significant amount of manual work was needed to identify the parent organization.

5.2.3. Identifying primary activities of book ISBN registrants

When assessing the quality of books based on their publishers' standing, it is beneficial to understand the primary activities of those who assign ISBNs. Such metadata could shed light on the actual contribution of ISBN registrants to the quality of books. An initial analysis of the GRP metadata revealed that the GRP does not include specific metadata indicating the primary activities of book publishers. But it does provide useful information for identifying them using links to registrants' websites ("Web Site"), contact details ("Admin Email"), and postal addresses ("Address") assisted in uncovering the organization responsible for registering ISBNs and its primary activities (as shown in the 'primary activities' block in Figure 3). Manual title-by-title inspection revealed a wide variety of activities corresponding to the following main categories: academic publishers; university presses and other university departments; general publishers; specialized publishers; publishing services and self-publishing; and nonpublishers (i.e., ISBN registrants for whom publishing is not the primary activity).

Academic publishers includes well-known academic publishers such as Springer Nature, Elsevier, SAGE, Walter de Gruyter, and other smaller publishers of scholarly books. Oxford University Press (OUP) and Cambridge University Press (CUP) were included in this category because they are not typical university presses, which are usually subsidized by their universities (Sisättö et al. 2012). Instead, OUP and CUP contribute to their universities' central budgets and are under similar pressures to commercial companies (Ferwerda, Pinter, and Stern 2017). However, the tax-exempt status of these presses—a long-standing source of resentment to other, truly commercial, companies—means that they cannot be considered entirely commercial publishers. Simply put, this category consists not only of commercial publishers (of any size) but also of not-for-profit publishers issuing only scholarly literature in any format (from printed to open access only).

University presses & departments comprises all university presses other than OUP and CUP, along with faculties, libraries, and other university departments.

General publishers consists of book publishers issuing publications for general audiences, including nonfiction, fiction, poetry, and comics. Some of these publishers engage in academic book publishing activity as part of their broader publishing program by issuing anthologies, interdisciplinary projects, and other writings.

Specialized publishers reflects the discovery that a significant share of REF book publishers are devoted solely to publishing books and related materials on a single topic, such as dance, football, translations of a particular author, faithful facsimile editions of medieval illustrated manuscripts, or esoteric studies.

Publishing services and self-publishing covers contract publishing companies, which offer editorial, copywriting, proofing, printing, book sales, distribution, marketing, and many other services. Some Lithuanian universities contract such companies to produce their scholarly books, so these companies assign ISBNs from their publisher prefixes. In addition, some Lithuanian researchers pay fees to printing houses to hide self-publishing because self-published books are not eligible as research outputs in Lithuania, where book publisher status is vital for research assessment. As was found in earlier research (Dagienė 2023a), a few books self-published abroad were awarded prestigious status because their title pages indicated universities or their departments as publishers, even though the ISBNs of those books were registered by individual faculty members. It must also be noted that whether the ISBN applicant becomes a self-publisher or an established publisher depends on the rules applied by the regional or national ISBN agency (see Section 5.4.1). This category also includes services for self-publishing, such as Amazon Kindle Direct.

Nonpublishers comprises organizations whose main sphere of activity is something other than publishing, such as independent research institutions (e.g., think tanks) established by governments, intergovernmental organizations, private funds, or researchers. Nongovernmental organizations such as the OECD, the World Bank, the International Trade Centre, and the European Union's diplomatic service fall into this category. The same applies to charitable foundations that work with schools, communities, agencies, governments, and NGO partners worldwide and at local, regional, and national levels. Also included are philanthropy projects,

"various learned societies" (e.g., the Royal Society or the ACM), museums, art galleries, public libraries, and other organizations with nonpublishing missions.

As mentioned, analysing the primary activities of book publishers revealed that some registrant names were not connected by prefixes in the GRP metadata. For example, searches for the primary activity of Oceana Publications led to Oxford University Press (OUP), which purchased Oceana in 2005[45]. A similar situation arose with Foundation Books, an imprint of Cambridge University Press (CUP) India[46], and with the Journal of Roman Archaeology, owned, managed, and published by CUP[47]; both were attributed to CUP in the final data set. Such discoveries helped unify publisher titles even further.

Some additional sources were used to refine the initially compiled data. First, the International Association of Scientific, Technical and Medical Publishers (STM) prepared a list of imprints of its publisher members in March 2016[48]; this list assisted in linking imprints to their parent companies in the final data set. Second, WorldCat Identities was handy when a registrant's website was not provided in the GRP or did not open, and the publisher could not be found on the internet. This portal helped to investigate whether a registrant was (or had been) a publisher[49]; if the answer was "yes," the topics of the books they produced indicated whether they were general, specialized, or academic publishers. Third, PublishersGlobal provides a directory that helped in gathering information about publishers, their publishing programs, and their services[50]. Fourth, the Open Library directory of the Internet Archive was used to determine the type of books issued by "disappeared" publishers[51]. Fifth, Crunchbase was used to find information on some of the acquisitions (e.g., that of Sense Publishers by Brill)[52]. These additional sources were convenient when a publisher shut down postacquisition and only its books could reveal the category to which it should be assigned.

The final UK data set comprises 38,050 ISBNs issued by 2,469 book publishers ("unified titles"), and the Lithuanian data set has 5,199 ISBNs published by 1,129 book publishers ("unified titles"). Section 5.5.1 analyses book publishers in the UK and Lithuanian data sets in more detail, and Section 5.5.2 shows the distribution of publishers by their primary

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[45] OUP buys Oceana. November 11, 2005. Publishers Weekly <https://www.publishersweekly.com/pw/print/20051114/26216-news-briefs.html> accessed on 19 January 2023.

[46] Foundation Books, an imprint of Cambridge University Press India Pvt. Ltd. <https://www.cambridge.org/core/publications/publishing-partners/foundation-books#> accessed on 19 January 2023.

[47] The Journal of Roman Archaeology is owned, managed, and published by Cambridge University Press <https://www.cambridge.org/core/journals/journal-of-roman-archaeology/information/about-this-journal> accessed on 19 January 2023.

[48] List of imprints of publisher members of STM. Revised March 2016 <https://www.stm-assoc.org/2016_03_23_STM_Imprint_list.pdf> accessed on 16 October 2022.

[49] WorldCat Identities <https://worldcat.org/identities> accessed on 1 December 2022.

[50] Services in Publishing Services Directory. PublishersGlobal <https://www.publishersglobal.com/directory/list-services/sort/popular> accessed on 1 December 2022.

[51] Publisher Search. Open Library is an initiative of the Internet Archive <https://openlibrary.org/publishers> accessed on 16 October 2022.

[52] Koninklijke Brill acquired Sense Publishers for an undisclosed amount. Crunchbase Inc. <https://www.crunchbase.com/organization/sense-publishers> accessed on 16 October 2022.

activities and number of books issued over the years. Section 5.5.3 analyses the countries in which ISBNs were registered.

5.3. Determining book genres

This section addresses my first research question: Using the ISBN Manual and the GRP, is it possible to determine the genre of a book?

One primary and widely accepted genre—the scientific monograph—is welcomed by policymakers in any country; even so, there is no unified definition of "monograph." Although research assessment policies usually expect a monograph to be a solid book, English dictionaries describe a "monograph" as a formal piece of writing or a short book on a particular subject.

5.3.1. Books and book genres in research assessment

In the United Kingdom, Crossick (2016) describes the monograph as "an extended work that exists as an integral whole in which argument and evidence weave together in a long and structured presentation." However, in the UK regulations, scientific works in book form are most often described as "books," "monographs," or "long-form research publications" (Crossick 2015; Lockett 2018) without unambiguous definitions.

Lithuanian policymakers, on the other hand, provide more definitions and clarifications, even though their main focus is on monographs. The first Lithuanian order for Requirements Applicable to Research Monographs, issued in 2001[53], provided the definition from Harrod's Librarians Glossary: "A monograph is a non-serial bibliographic item, i.e., an item complete in one part, or a systematic or complete publication on a single subject."

Since 2008, the Lithuanian regulations have contained an exhaustive definition of a monograph. Thus, books have been treated as scholarly monographs (and made eligible for research assessment) only if they have such features as being a "non-serial and non-continuous bibliographic unit (publication), which systematically and (or) exhaustively analyses one topic (subject), contains clear and prominent novelty elements, provides a solution to scientific uncertainty (which was not evident from the existing body of knowledge and level of methodology), assigned with ISBNs, and being longer than 140 pages."

Nevertheless, in addition to monographs, the Lithuanian regulations list a wide variety of book genres eligible for research assessment, such as scientific study, research reference book, encyclopaedia, (bio)bibliography, and scientific dictionary. However, no formal definitions are given in the orders, leaving it to the experts to decide whether submitted books fit into any listed genres.

In addition to several items mentioned in the Lithuanian regulations, Basili and Lanzillo (2018) list the following genres identified in Italian research assessment policies: assessment

[53] Order No. 1704 "Requirements Applicable to Research Monographs" was signed by the Minister of Education and Science of the Republic of Lithuania on December 22, 2001.

lexicons, critical editions, conference proceedings, systematic indices, scientific comments, collections of own research articles, and publications of unpublished sources.

Moreover, inventive scholars create many more genres of books than research assessment policies could describe. Unfortunately, neither dictionaries nor research assessment policies have universally accepted unambiguous definitions of which books are considered scientific monographs and which are not—to say nothing of the ambiguities surrounding other genres. In the following subsection, I will examine how the ISBN Manual portrays a book and its genres.

5.3.2. Books and book formats in the ISBN Manual

In fact, the ISBN Manual (International ISBN Agency 2017) has neither "book" nor book genre definitions, stating only that "A definition of 'Book' is not included as continuing technological and market developments would rapidly make any definition obsolete." Perhaps such a statement discouraged bibliometricians from exploring the ISBN Manual further in their works.

Instead, the ISBN Manual uses only three terms—work, manifestation, and item—describing books as products that may have many formats embodying essentially the same content. The world of books is multifaceted, resulting in an even more extensive number of ISBNs that may be associated with the same book. The ISBN Manual envisions many variations when different ISBNs are given to the same book content; each of these ISBNs may indicate a different print format, corrected or enhanced edition, translation, digital edition, or other forms of the same work or research product. Such a variety of ISBNs creates confusion for research assessment systems, which consider original research products but typically have no interest in their variations. Indeed, the ISBN Manual provides detailed guidance on the assignment of ISBNs to numerous formats of books issued for retail trade because "correct use of the ISBN allows different product forms and editions of a book, whether printed or digital, to be differentiated clearly, ensuring that customers receive the version that they require." Moreover, the ISBN Manual explains the steps necessary to ensure that ISBNs are correctly assigned.

The most essential feature of ISBNs created for the book supply chain is that "a particular edition published by a particular publisher receives only one ISBN. This ISBN must be retained no matter where, or by whom, the publication is distributed or sold." However, as the ISBN Manual states, a unique book can be either a "work" identified with a single ISBN (assigned by its primary publisher) or a "work" identified with multiple ISBNs (assigned by either direct publishers or other ISBN registrants). Collecting the metadata for those multiple ISBNs in one place would considerably simplify the assessment of books. Precise identification of a book (and its possible formats) is the most valuable ISBN feature from the perspective of book evaluation and book metrics seeking to assess individual books but not their publishers. This ISBN feature is already employed by librarians, who enrich the metadata linked to every book ISBN in library catalogues, suggesting directions for future research.

Because the ISBN Manual does not define a book or its genres, it is impossible to determine the book genre using ISBN-relevant metadata compiled in the GRP or even in internationally known library catalogues. The ISBN Manual does, however, explain that in the supply chain, each book and its various formats are identified by unique ISBN codes. Such identifiers could be valuable for research assessment systems seeking to assess individual books instead of evaluating scientific works according to the reputation of their publisher.

5.4. Determining book publishers

This section addresses my second and third research questions: Using the ISBN Manual and the GRP, is it possible to determine the publisher of a book and the role the publisher has played in producing the book? Furthermore, can the GRP be used to determine the primary activities of book publishers?

Using ISBNs from empirical data and metadata gathered from the GRP, this section will give a more detailed account of the complexities one might face in identifying actual book publishers. The not-so-apparent practicalities of assigning ISBNs highlight challenges in recognizing primary publishers. Here, I argue specifically against relying on a publisher's reputation as a proxy measure for book quality.

5.4.1. Who is the book publisher in the ISBN World?

According to the ISBN Manual, book publishers are "*individuals or corporations responsible for all stages in creating, producing, disseminating, and marketing digital or printed publications*." When participating in the ISBN system, publishers and self-publishers must report all information about titles to which they have assigned ISBNs to the regional or national ISBN Agency[54].

According to the ISBN Manual, the book publisher's name should appear in a publisher statement on the book's copyright page (e.g., "Published by ------"). To comply with that rule, the book publisher's name should be the same as the ISBN registrant name found in the GRP metadata using the publisher prefix extracted from the book ISBN. However, this is not always the case in real life: Empirical investigation shows that even though universities or departments are named as book publishers on books' copyright pages, the GRP metadata occasionally reveals that researchers, faculty members, or other natural persons registered the books' ISBNs. Such findings differentiate the ISBN registration role from other publishers' responsibilities specified in the ISBN Manual, such as production, dissemination, and marketing.

Even though *ISBN registrant* is only one of the possible roles in book production, three types of registrants are recognized in the ISBN Manual: established publishers, intermediaries, and occasional publishers (Figure 6).

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[54] About the ISBN Standard. ISBN.org by Bowker <https://www.isbn.org/about_ISBN_standard> accessed on 26 January 2023.

Established publishers can be identified by a publisher prefix which consists of a set containing from 10 to 100,000 ISBNs. From such sets, publishers can assign ISBNs to the books they publish. Publisher prefixes can be given to legal entities (companies and institutions) or individuals declaring their intention to publish books (i.e., to become established publishers).

Intermediaries can only issue ISBNs in certain limited circumstances (i.e., the publisher asks an intermediary to produce different digital formats but does not provide the corresponding ISBNs, or the publisher is based in a country outside the ISBN system and so asks a distributor from another country to import and distribute the book and assign ISBNs). According to the ISBN Manual, this is quite rare, but the empirical data indicates that it also depends on the traditions prevailing in the country (Figure 15); for example, intermediaries rarely assign ISBNs in the United Kingdom, but almost 6% of Lithuanian book ISBNs were assigned by intermediaries. In this way, the ISBN registrant and copyright holders may differ.

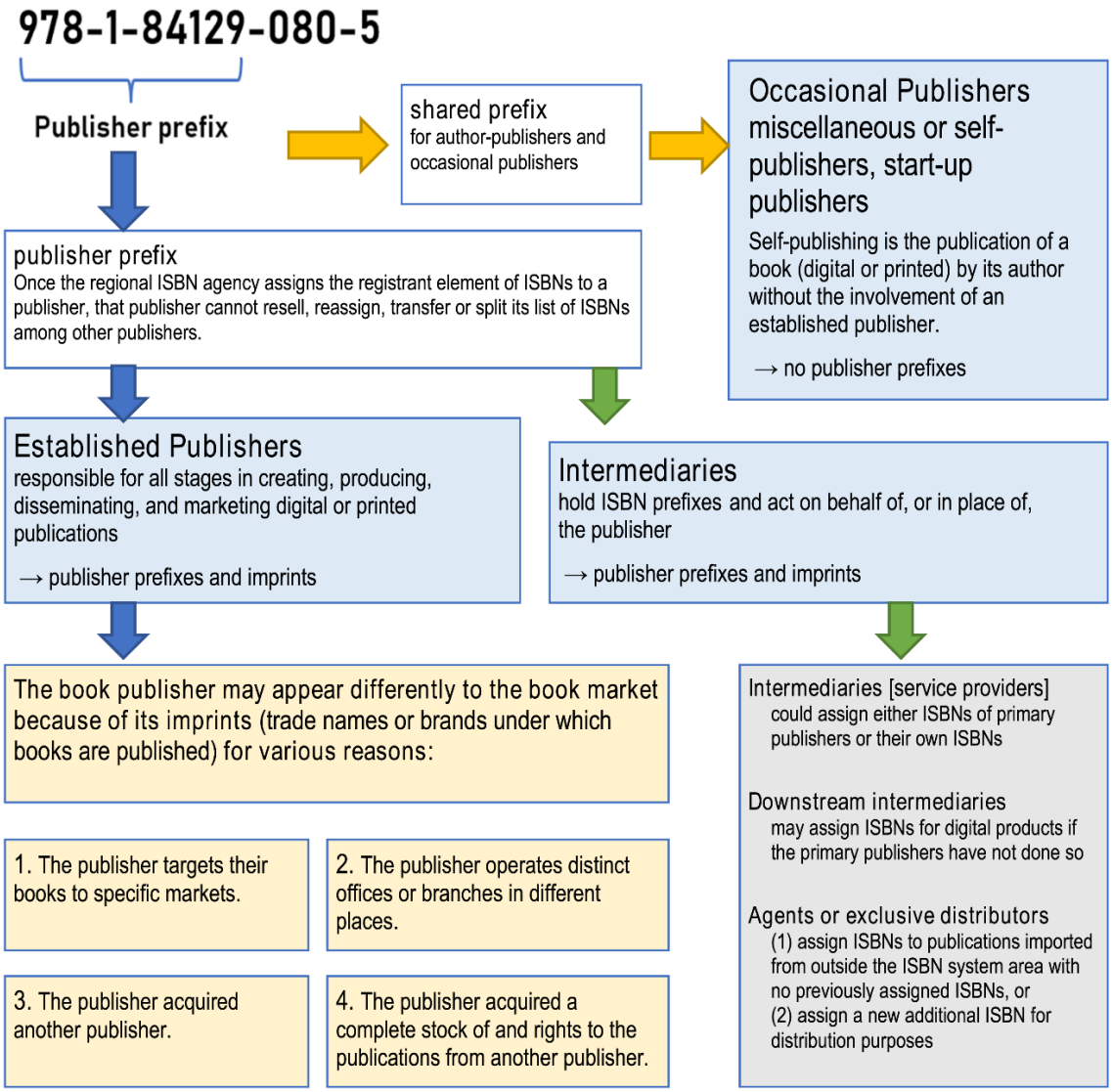

Figure 6. Types of publishers identified by publisher prefixes and their roles in book publishing as defined in the ISBN Manual.

Occasional publishers, also called *miscellaneous* or *self-publishers*, are usually authors or independent organizations having no intention of becoming book publishers apart from making their own books publicly available. They can obtain ISBNs for their books from shared prefixes. These shared prefixes in the GRP metadata have a variety of names, such as *Author-publishers (miscellaneous)*, *Various UK Author Publishers*, *Polish ISBN Agency*, and *Agencia del ISBN de España*.

However, if research assessment systems, mandating ISBNs, judge books by their publishers, they must be aware that regional or national ISBN agencies have different application procedures and protocols. These rules differ from country to country, causing confusion for implementers of research evaluation policies and for those being evaluated.

The ISBN system has flexible rules about who can hold publisher prefixes: legal entities, their departments independently, or individuals. There are differences among ISBN agencies in terms of how the ISBN system operates, and this often reflects legal requirements in the countries concerned; for example, in some countries, all publishers may have to be formally registered as legal entities before they may apply for ISBNs. Differences arose from empirical data when I attempted to identify which ISBN registrants were established publishers by analysing publisher prefixes extracted from ISBNs. The first difference in agency rules exists in *giving publisher prefixes for newcomers in book publishing*. Registration agencies may impose a limit on the number of ISBNs from a shared prefix that can be given to occasional publishers before they are allowed to request their own prefixes (along with a range of ISBNs). In some countries, registration agencies may decide that publishing three or four books over a few years is enough to merit the smallest publisher prefix (a block of 10 ISBNs), but in other countries, persons or organizations entering book publishing and requesting ISBNs for their books may obtain individual ISBN codes and receive self-publisher status at the beginning—a status deemed entirely legitimate in the ISBN world.

Another difference is that *only legal entities can be given publisher prefixes in Lithuania*. In general, any organization can receive publisher status and publisher prefixes, regardless of the organization's legal status. However, in Lithuania, a university faculty or department cannot act as a publisher. Instead, a single university department—usually a university press—holds the authority to assign all ISBNs. This policy differs from that in the United Kingdom or other European countries, where many universities have numerous departments owning publisher prefixes containing just 10 ISBNs and identifying them as small book publishers. Similarly, natural persons will not be given publisher prefixes in Lithuania if they do not operate an officially registered business. In other countries, there are several cases in which individuals are registered as established publishers and may assign ISBNs from their publisher prefixes. A deeper look at these individuals/publishers reveals that such individuals are usually intermediaries playing the ISBN registration role. In some cases, those ISBN registrants have been found to be book authors, and in other cases, their functions (e.g., as established publishers) are not apparent either from the book metadata or from internet search.

Academic publishing is constantly changing, and more intermediaries have become involved in assigning book ISBNs. I identified individuals, printing houses, companies offering print-on-demand or publishing services, and self-publishing platforms when I explored primary

activities of the ISBN registrants engaged in UK and Lithuanian book production. According to the ISBN Manual, third-party service providers should not typically be given a registrant element (publisher prefix) unless they are also publishers. As those intermediaries were identified in our data sets by their publisher prefixes, they acted as established publishers and did not violate the ISBN rules. For example, publishing service providers assigned more than 6% of Lithuanian but only 0.5% of British book ISBNs (see Section 5.5.2).

To conclude this subsection, even though the ISBN Manual attributes many roles to a book publisher, such as the creation, production, dissemination, and marketing of both digital and printed formats, the flexibility of the ISBN system allows anyone to register book ISBNs and be named as a publisher. However, the ISBN Manual and the GRP clearly identify the registrant of a particular ISBN—which means both sources point to "the ISBN registrant role." Even so, "ISBN registrants" are not always responsible for the quality of the research presented in a book, contrary to what some research evaluators and academics seem to believe.

In the following subsection, I show why it may be challenging to identify the actual publisher of a book, even when the ISBNs were registered by a well-known publisher.

5.4.2. Complexities of identifying "parent" publishers

To demonstrate that even publisher prefixes cannot always help detect the book's actual publisher, it is worth exploring the ISBN Manual to learn about situations that arise in assigning ISBNs. Analysing the ISBN Manual, I noted that publishers may hold many prefixes and be represented by numerous imprints. The ISBN Manual describes "imprint" as a trade name or brand under which a work is published, providing three notes regarding imprints. First, a publishing company may have multiple imprints in order to target their books at specific markets (e.g., HarperCollins Education, Voyager, and William Collins are all imprints of HarperCollins and not separate companies). Second, in some cases, "multiple imprints may be the result of mergers or acquisitions of different companies who wish to differentiate their brands." Third, an imprint is a name and not only a logo.

The imprints of the same publisher may appear different from their parent companies, and researchers investigating book metrics have noted the implications for reporting about such publishers and their brands. Because of the constantly changing publishing landscape, some researchers focus on publishers' titles as presented on the copyright pages of books (Tanner 2016), and others argue that imprints must be distinctly identified because they "do not necessarily have the same role as their 'parent' publishing houses" (Zuccala et al. 2015). The number of brands/imprints linked to a parent company may increase or decrease as a result of mergers or acquisitions.

The ISBN rules state that when the ownership of the prefix changes, the publisher must inform the ISBN agency responsible for that prefix to make relevant changes in the ISBN and GRP metadata. According to the ISBN Manual, when publishers merge, books may continue to be issued under the names of both publishers using either separate registrant elements or sharing the same one, depending upon market practice. If publishers follow the rules in reporting their imprints' connections, the same prefixes will appear in the metadata of all related brands. In

the following subsection, I will explain the challenges that nonetheless arose in identifying parent publishers in the UK and Lithuanian data sets.

Operating under multiple imprints

The most significant challenge was connecting not-so-apparently linked imprints/brands to specific publishers. Three rationales behind publishers' use of multiple brands were identified by exploring the ISBN Manual, analysing empirical data, and consulting the International ISBN Agency.

The first rationale is that publishers target their books to specific readers (children, academics, poetry aficionados, etc.). For example, multinational publisher HarperCollins has decided that it suits their business to have one ISBN prefix (e.g., 978-0-00, holding 1 million ISBNs) and use the same prefix for nearly a hundred names/brands: Collins, Fourth Estate, Bartholomew, Fontana, Thorsons, etc. Another publisher, Dostoyevsky Wannabe, tells a vivid story about its creative use of imprints:

> *Still, we decided we liked making up imprints so we have a few and we'll probably have more later. Who doesn't like a good imprint anyway? We might firm up these imprints eventually and make them mean something more. We might. Or we might not. Actually maybe the imprints are grouped according to aesthetic design style. Are they? That might be it. Let's see if we can find out*[55].

Linking all brands is simple when publishers have a single publisher prefix. However, many publishers have separate ISBN prefixes for each imprint name. By extension, university departments or an entire university can also choose to have their individual ISBN prefixes—their own ISBN blocks—distinct from that of the university press (further discussed in Section 5.5.2). Many obscure names of presses run by university departments were found in the data sets. Nevertheless, both models (one prefix, many brands; many brands, separate prefixes) are possible and are equally supported by the flexible ISBN system. As various cases were identified in the empirical data, all brands were appropriately linked in the final data sets used for the bibliometric analysis presented in Section 5.5.

The second rationale is that publishers operating separate and distinct offices or branches in different places may have a registrant element for each office or branch. The office responsible for a publication assigns it an ISBN, indicating the region it was registered in. For this reason, books published by international publishers such as Springer, Peter Lang, or Oxford or Cambridge University Press may have imprints (publisher prefixes) distinguishing books issued in the United States, the United Kingdom, Germany, India, Italy, and other countries.

The third rationale is that multiple imprints with different prefixes may result from mergers or acquisitions of other companies that wish to differentiate their brands. According to the ISBN Manual, the new owners should inform the national ISBN agency responsible for the acquired registrant element about the changes in ownership. If books continue to be published under the names of both publishers, they may have separate registrant elements or share the

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[55] About Dostoyevsky Wannabe and its different imprints. Dostoyevsky Wannabe "Publishing." <https://dostoyevskywannabe.com/about> accessed on 1 December 2022.

same prefix, depending upon market practice. Publishers can continue to use unassigned ISBNs from the initially assigned registrant elements after an acquisition.

There are cases in actual book publishing where book publishers do not declare their imprints in the ISBN system; thus, their brands are not traceable in the GRP metadata. For example, many academics have heard of Lambert Academic Publishing, but they may not be aware that LAP Lambert is one of 17 academic brands owned by OmniScriptum. This parent company only introduces its imprints on its webpage[56], not in the ISBN system. In the GRP, OmniScriptum is presented under the registrant name *OmniScriptum GmbH & Co. KG*, registering ISBNs in Germany, and under two further registrant names, *International Book Market Service ltd* and *VDM*, *Omniscriptum*, which operate in Mauritius.

Merging, acquiring, and moving back and forth

In addition to the use of multiple brands, the ISBN Manual addresses other practicalities, such as mergers and acquisitions, that challenge those who seek to identify "parent" publishers. I discovered several such cases contemplated in the manual and borne out by the empirical data. In one instance, the imprints of purchased publishers were split, so one merged with the parent company, and another was spun off as an independent publisher. In another case, the acquired brand moved back and forth before becoming independent, and smaller competitors were absorbed by more prominent publishers. There are additional cases in which publishers do not join another publisher but instead sell their entire book program, or a part of their publishing program, or one of many book series. All these practices are considered legitimate in the book publishing business but create confusion when books are assessed by the standing of their publishers. Below, these examples are explained in more detail.

Splitting imprints of the purchased publisher. Before Taylor & Francis acquired Ashgate Publishing in 2015, Ashgate Publishing had two brands: Gower Publishing and Lund Humphries. Both brands still have the prefix 978-1-4724 in their GRP metadata. This prefix is found in 287 REF books across seven registrant names (see column "GRP titles" in Figure 7).

In fact, Taylor & Francis acquired only Ashgate but not Lund Humpries, which relaunched as an independent publisher in December 2015[57]. In the GRP system, Lund Humphries holds five prefixes, of which two (978-1-4724 and 978-1-84822) were found in the REF data. Double-checking the distribution of books assigned from those prefixes over the years (Figure 7) and consulting the library catalogues led to the decision that books assigned from the prefix 978-1-84822 should be attributed to Lund Humphries as an independent publisher. Nevertheless, one could argue that only books issued after 2015 can be attributed to Lund Humphries, which maximizes the number of books assigned to Informa (Taylor & Francis).

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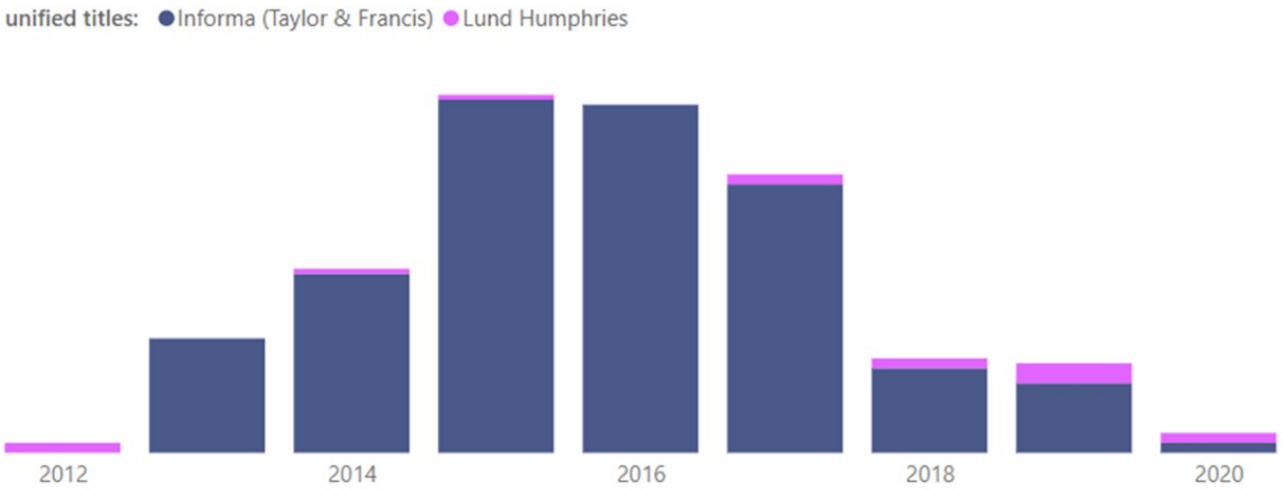
[56] Our brands. Omniscriptum <https://www.omniscriptum.com> accessed on 1 December 2022.

[57] Onwuemezi, N. Lund Humphries relaunches as indie publisher. The Bookseller, December 3, 2015. <https://www.thebookseller.com/news/lund-humphries-relauches-indie-publisher-317843> accessed on 1 December 2022.



prefixes	GRP titles	Count of ISBNs	unified titles
978-1-4724	Ashgate Publishing Limited; CRC Press; Gower Publishing Ltd; Lund Humphries Publishers Ltd; Routledge; The Hakluyt Society; Variorum	287	Informa (Taylor & Francis)
978-1-84822	Lund Humphries Publishers Ltd	14	Lund Humphries

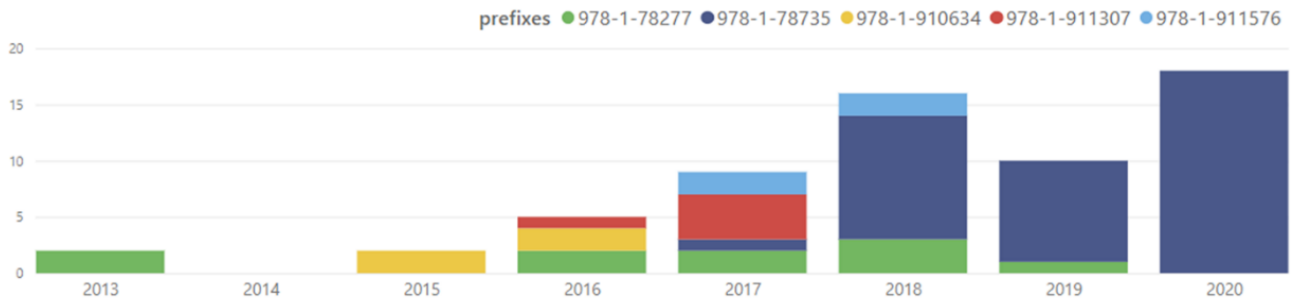
Figure 7. Dealing with the prefixes 978-1-4724 and 978-1-84822.

Imprints moving back and forth. The University College London (UCL) Press may be the most notorious example of a brand migrating between publishers. Figure 8 shows that in the GRP metadata, UCL Press appeared among many brands attributed to Informa (Taylor & Francis) under the prefix 978-0-415, as an imprint of Cavendish Publishing Limited under the prefix 978-1-84472, and with five additional prefixes. According to Ayris et al. (2014), "The UCL Press imprint was licensed to a commercial publisher(s), but no one had published under the imprint since 2007." Consulted library catalogues indicate that REF books with this prefix were published by Routledge and, as the STM list of imprints suggested, Cavendish was a Taylor & Francis brand at that time. For these reasons, two books published under the prefix 978-1-84472 in 2008 and 2010 should be attributed to Informa (Taylor & Francis).

prefixes	GRP titles	Count of ISBNs	unified titles
978-0-415	ABP (UK) Ltd; Architectural Press; Ashgate Publishing Limited; Birkbeck Law Press; Brunner-Routledge; CRC Press; David Fulton Publishers Ltd; Earthscan Ltd; Estates Gazette; Focal Press; Frank Cass Publishers; Gestalt Press; Gower Publishing Ltd; Informa Healthcare; Informa Law; Psychology Press Ltd; Routledge; Routledge Academic; Routledge Falmer; Routledge India; RoutledgeCurzon; Spon Press; Taylor & Francis Ltd; UCL Press	2092	Informa (Taylor & Francis)
978-1-78735	UCL Press	39	UCL Press
978-1-78277	Institute of Education Press; UCL Press	10	UCL Press
978-1-911307	UCL Press	5	UCL Press
978-1-910634	UCL Press	4	UCL Press
978-1-911576	UCL Press	4	UCL Press
978-1-84472	UCL Press an Imprint of Cavendish Publishing Limited	2	Informa (Taylor & Francis)
Total		**2156**	

Figure 8. University College London (UCL) Press appearances in the GRP metadata.

An additional issue with the UCL-related prefix 978-1-78277 relates to the Institute of Education Press, based at UCL's Faculty of Education and Society, which issued several books from 2013 to 2019. The prefix attribution decision was simple when it was found that the institute officially merged with UCL Press in 2019[58]; finally, the unified title "UCL Press" shows an independent publisher holding five prefixes (Figure 9).



prefixes	GRP titles	Count of ISBNs	unified title
978-1-78735	UCL Press	39	UCL Press
978-1-78277	Institute of Education Press; UCL Press	10	UCL Press
978-1-911307	UCL Press	5	UCL Press
978-1-910634	UCL Press	4	UCL Press
978-1-911576	UCL Press	4	UCL Press
Total		**62**	

Figure 9. UCL Press prefixes and book ISBNs issued from 2013 to 2020.

The situation of UCL Press becoming independent after migrating from one publisher to another is not unique in the REF data set. For nearly 12 years, David Fickling Books operated as an imprint—first as part of Scholastic, then of Random House—before setting up as an independent business in 2013[59].

Absorbing competitors. Although some brands have survived after mergers with more prominent publishers, others have disappeared. This can be seen in the case of Cavendish Publishing, which was acquired by Taylor & Francis in 2006. After the acquisition, for some time, books were issued under a new name, "Routledge-Cavendish,"[60] until Cavendish Publishing finally disappeared in 2012[61].

Book copyrights or book series sold to another publisher. Research assessment policies oriented to assessing books by their publishers must also consider the situation in which publishers sell part of their program or the entire book series to another publisher. I came across this case in identifying the primary publishers of 187 books whose ISBNs were assigned from the registrant prefix 978-1-4742. This prefix appeared in the GRP metadata of both megapublishers Bloomsbury and Taylor & Francis (Figure 10). As those publishers are

[58] UCL IOE [Institute of Education] Press. UCL Press <https://www.uclpress.co.uk/pages/ucl-ioe-press> accessed on 22 October 2022.

[59] About us. David Fickling Books <https://www.davidficklingbooks.com/AboutUs.php> accessed on 1 December 2022.

[60] Cavendish Publishing Limited. WorldCat Identities, OCLC <https://www.worldcat.org/identities/lccn-no95015467> accessed on 22 October 2022.

[61] Cavendish Publishing Limited. Companies House <https://find-and-update.company-information.service.gov.uk/company/02235830> accessed on 22 October 2022.

independent, I needed to determine which one actually published these books. I inspected initial REF data, searching for the publishers that institutions included, along with ISBNs bearing the relevant prefix. Bloomsbury is indicated as the publisher for some books, Taylor & Francis for others. Library catalogues and search engine results have resolved the mystery, because some library catalogues have included a statement "First published … by Bloomsbury Academic" from the book's copyright page, along with corresponding information presented in the books issued by Taylor & Francis. As attested in the ISBN Manual, selling rights to book series, distribution, or different formats is normal in book publishing. Consequently, Bloomsbury is set as responsible for these prefixes and their ISBNs in the final data sets.

prefixes	GRP titles	Count of ISBNs	unified titles
978-1-4742	Arden Shakespeare; Bloomsbury Academic; Bloomsbury Visual Arts; Fairchild Books; Methuen Drama; Nomos/Bloomsbury; T&T Clark; Taylor & Francis Ltd; The Arden Shakespeare	187	Bloomsbury
Total		**187**	

Figure 10. The same prefix was used to assign ISBNs for later editions.

There is one further case to consider, in which a publisher purchases copyrights of some books from the publishing program of another publisher. I discovered this in my data set while determining the unified title attributed to the prefix 978-1-84773 and the main activities of New Holland Publishers. According to the search results, New Holland Publishers sold copyrights to their natural history list to Bloomsbury in 2013[62] and 1,400 titles to Fox Chapel in 2014[63]. However, because the book in the data set was issued in 2010, New Holland Publishers was set as the unified title. There are other examples of this situation; the goal here is simply to demonstrate challenges in detecting book publishers by publisher prefixes.

In summary, although the GRP is the primary source for gathering reliable information on ISBN registrants, the GRP metadata do not always help unravel the twists and turns of complex interactions within the book publishing industry. In some cases, the detecting parent titles of particular book publishers requires considerable manual effort, as does determining the primary activities of ISBN registrants in parallel with the unique names of book publishers. Having enriched the metadata of the ISBNs, I proceed with a bibliometric analysis.

5.5. Analysing book publishing practices using GRP metadata

I now consider my fourth research question: Can the GRP be used to develop an in-depth understanding of researchers' book publishing practices? Using ISBN metadata relevant to research assessment practices, obtained through a manual curation process (as discussed in Sections 5.3 and 5.4), I demonstrate that the GRP is a suitable source for bibliometric

[62] Allen, K. Bloomsbury buys New Holland list. The Bookseller <https://www.thebookseller.com/news/bloomsbury-buys-new-holland-list> accessed on 22 October 2022.

[63] Fox Chapel buys 1,400 New Holland titles. Publishers Weekly, April 21, 2014 <https://www.publishersweekly.com/pw/by-topic/industry-news/industry-deals/article/61952-fox-chapel-buys-1-400-new-holland-titles.html> accessed on 22 October 2022.

analysing. As mentioned initially, reputational capital still matters for scholars and publishers alike, and the following subsections analyse whether researchers' publication practices have changed along with shifts in the publishing landscape and research assessment requirements. For instance, have British authors started to publish more books with universities? Or have Lithuanian researchers moved abroad to publish their research outputs? First, however, I will examine the publishers' portfolios and their changes over the years.

5.5.1. Publishers of UK and Lithuanian books

The final UK data set shows that just under 38,050 valid ISBNs were assigned from 3,804 prefixes attributed to 2,469 publisher titles. In the Lithuanian data, approximately 5,199 valid ISBNs were assigned from 1,561 prefixes linked to 1,154 unique publisher titles. These numbers indicate that an average publisher in the UK data set doubled the number of books produced, from four in 2008 to eight in 2020. Meanwhile, in the Lithuanian data set, an average publisher issued about two books nearly every year from 2008 to 2020 (Figure 11).

The top 10 publishers of UK books have published more than half of all REF books since 2009, and the other 2,459 publishers have produced considerably fewer books since 2013 (Figure 12). Conversely, for Lithuanian books, the top 10 publishers published fewer books than the other 1,144 publishers over the entire period.

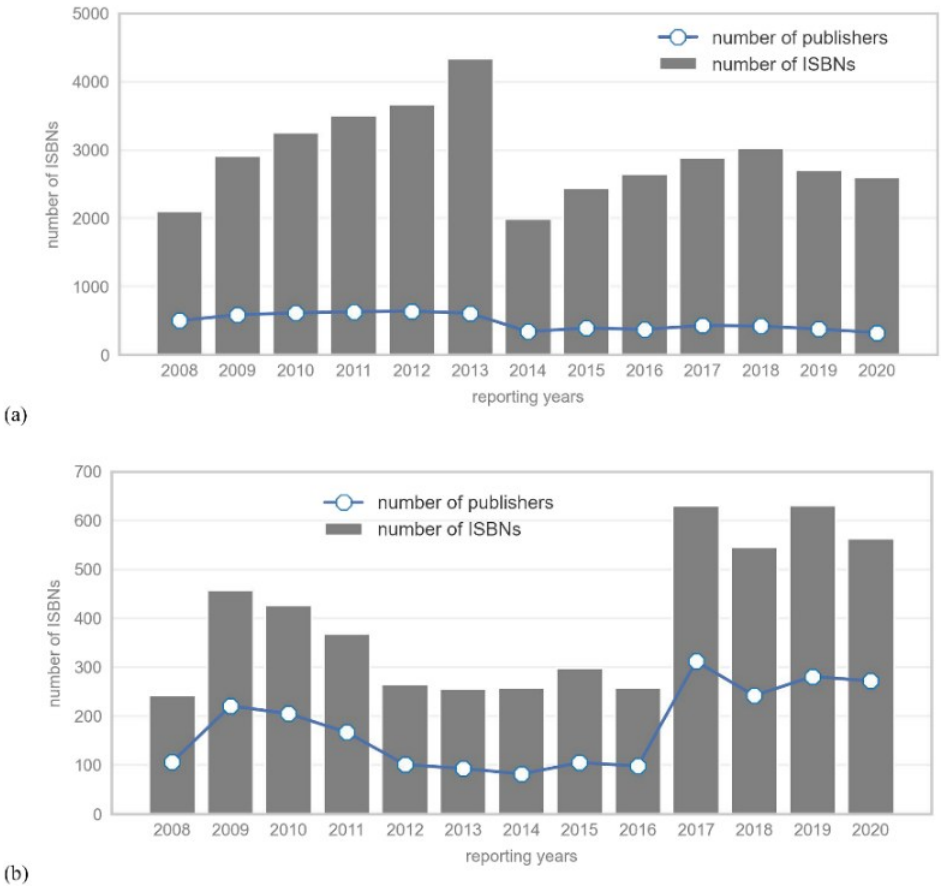
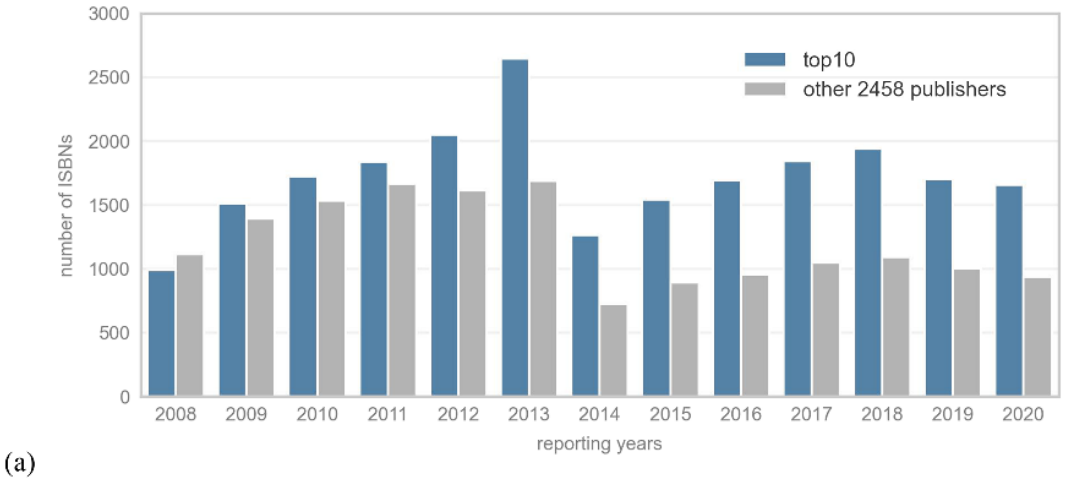
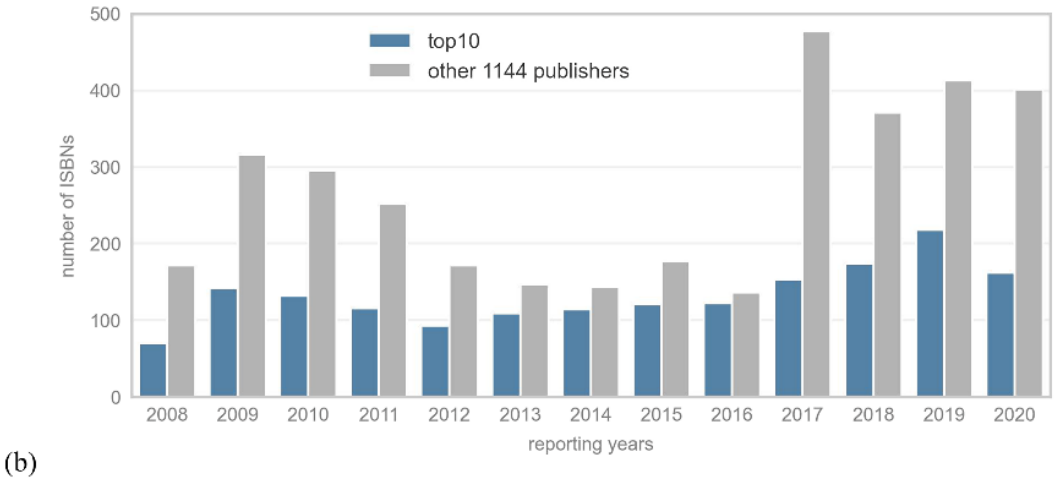


Figure 11. Number of publishers involved in production of (a) UK and (b) Lithuanian books.



(a)



(b)

Figure 12. Number of books in (a) the United Kingdom and (b) Lithuania published by the top 10 publishers and others.

As seen in Figure 13, the UK and Lithuanian results differ in some additional respects. In the United Kingdom, the top 10 publishers produced almost two-thirds of books submitted for research evaluation from 2008 to 2020, whereas in Lithuania, the top 10 published just over one-third of such books. Moreover, in the Lithuanian setting, occasional publishers (i.e., those issuing 1–10 books) collectively "out-published" the top 10, whereas in the United Kingdom, these occasional publishers are responsible for only a tiny fraction of books published.

Looking deeper into the data, the top 10 publishers in each country include well-known academic publishers and local university presses or academic institutions (Figure 14). In the United Kingdom, Informa (Taylor & Francis) and Springer Nature lead the top 10 book publishers, followed by Oxford University Press (OUP) and Cambridge University Press (CUP). For reasons outlined in Section 5.2.2, the latter two are quite distinct from other university presses in their scope and operation; thus, we may say that only two university presses represent universities among the United Kingdom's top 10 book publishers.

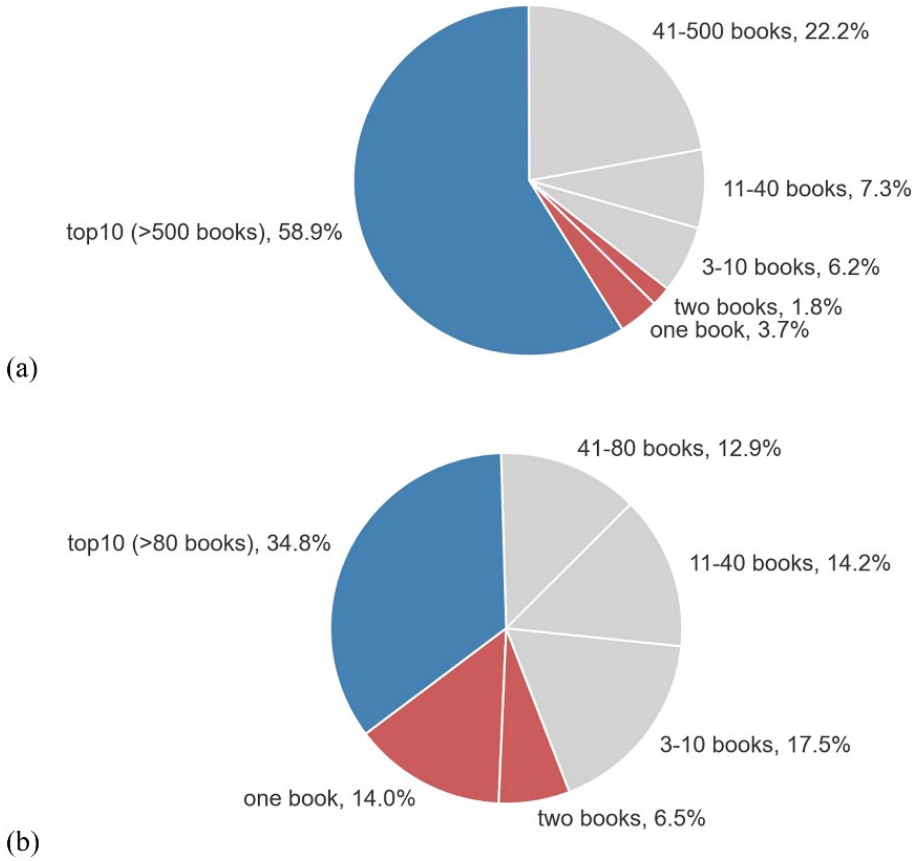


Figure 13. Share of books in (a) the United Kingdom and (b) Lithuania published by publishers of different size, as determined by the number of published books.

	UK data, 2008-2020		**Lithuanian data**, 2008-2020	
	top 10 publishers (> 500 ISBNs)	Share of ISBNs	top 10 publishers (> 80 ISBNs)	Share of ISBNs
1	Informa (Taylor & Francis)	15.42%	→ **Springer Nature**	6.44%
2	Springer Nature	11.39%	Vilnius University	5.02%
3	Oxford University Press	8.95%	Vytautas Magnus University	4.79%
4	Cambridge University Press	6.82%	→ **Informa (Taylor & Francis)**	3.17%
5	Bloomsbury	6.60%	Institute of Lithuanian Literature and Folklore	3.02%
6	Brill	2.73%	Mykolas Romeris University	2.52%
7	→ **Manchester University Press**	2.04%	Klaipeda University	2.50%
8	John Wiley & Sons	1.75%	Institute of the Lithuanian Language	2.04%
9	→ **Edinburgh University Press**	1.72%	Kaunas University of Technology	1.67%
10	Boydell & Brewer	1.44%	Institute of Lithuanian History	1.67%
	Other 2,5K publishers (41.15%):		Other 1,1K publishers (67.14%):	
	73 publishers of 41-500 books	22.05%	399 publishers of 2-10 books	26.33%
	833 publishers of 2-10 books	8.04%	718 publishers of one book	13.81%
	56 publishers of 21-40 books	4.19%	12 publishers of 41-80 books	13.43%
	1461 publishers of one book	3.84%	15 publishers of 21-40 books	8.17%
	80 publishers of 11-20 books	3.03%	18 publishers of 11-20 books	5.40%
	Total	100%	Total	100%

Figure 14. Percentage of books in the UK and Lithuania published by the top 10 publishers and others.

In contrast to the United Kingdom, domestic higher education and research institutions made up most of the top 10 Lithuanian book publishers; only two international commercial publishers make the list. Every university and research institute in Lithuania has its own publishing department, which leaves almost no room for independent academic publishers. Moreover, in-house publishing is a long-standing tradition in Lithuania and perfectly suits the country's academic community: It meets the needs of researchers who wish to publish their books as quickly as possible in pursuit of degrees and promotions, and it is useful to institutions seeking to maximize book publications for funding and assessment purposes. In fact, Lithuanian university presses usually do not influence the content of works they issue; they simply manage production, distribution, and marketing of manuscripts already approved by faculties. A similar situation can be found in the Czech Republic (Broz and Stöckelová 2018) and other European countries (Ferwerda et al. 2017).

5.5.2. The primary activities of book publishers

Academic publishers produced more than two-thirds of the UK books in the data set and slightly over a quarter of the Lithuanian books (Figure 15). Interestingly, the share of UK books produced by universities is almost the same as that of Lithuanian books issued by "nonpublishers" (organizations whose main mission is something other than publishing). Self-publishing, meanwhile, includes books issued by companies providing publishing services (see Section 5.2.2), which usually act as intermediaries (Section 5.4.1).

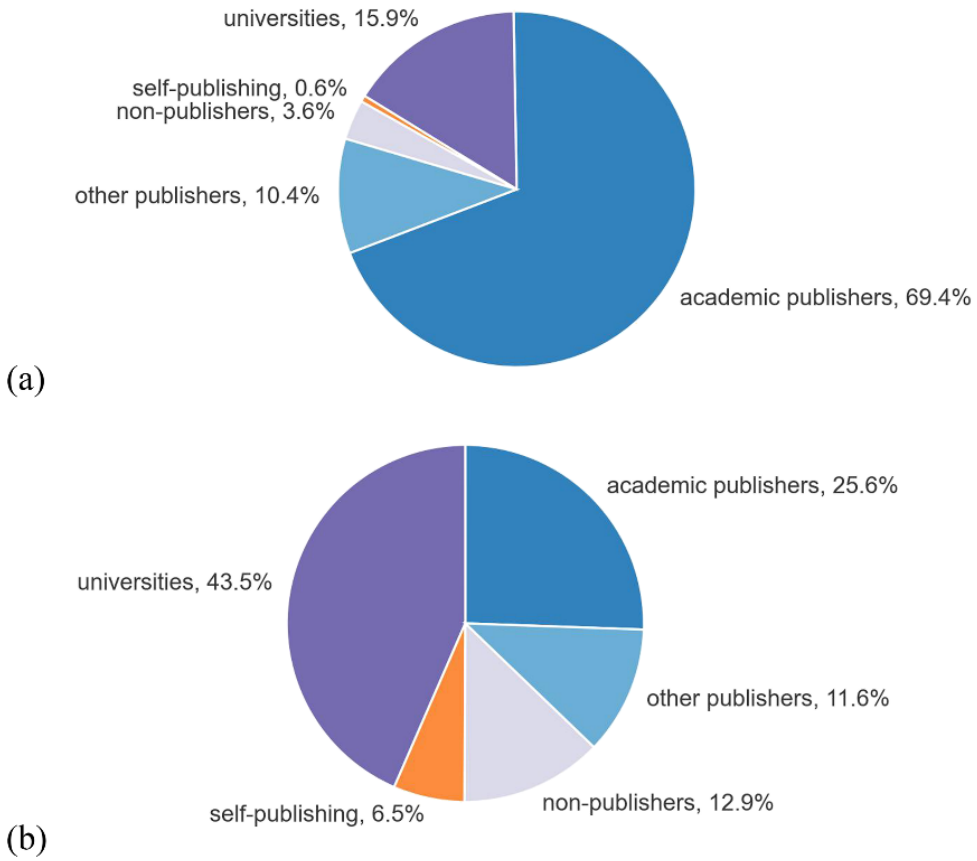


Figure 15. Share of books in (a) the United Kingdom and (b) Lithuania published by different types of publishers.

The large share of academic publishers and universities in the United Kingdom can be explained by the fact that UK institutions and departments selected the books they considered their best research outputs and "still insist that scholars publish with the more established and reputable academic and university presses" (Deegan 2017). The UK picture would change considerably if all scholarly books, not just those selected by institutions and submitted to the REF, were included in the analysis.

In the United Kingdom, the number of books published through publishing and self-publishing services is relatively small. In contrast, Lithuania has seen a significantly higher number of books being self-published or released by intermediaries, with a substantial portion being issued by nonpublishers. These findings for Lithuania are particularly noteworthy given the long-standing policy efforts aimed at internationalizing local research and encouraging researchers to publish with the most prestigious academic publishers.

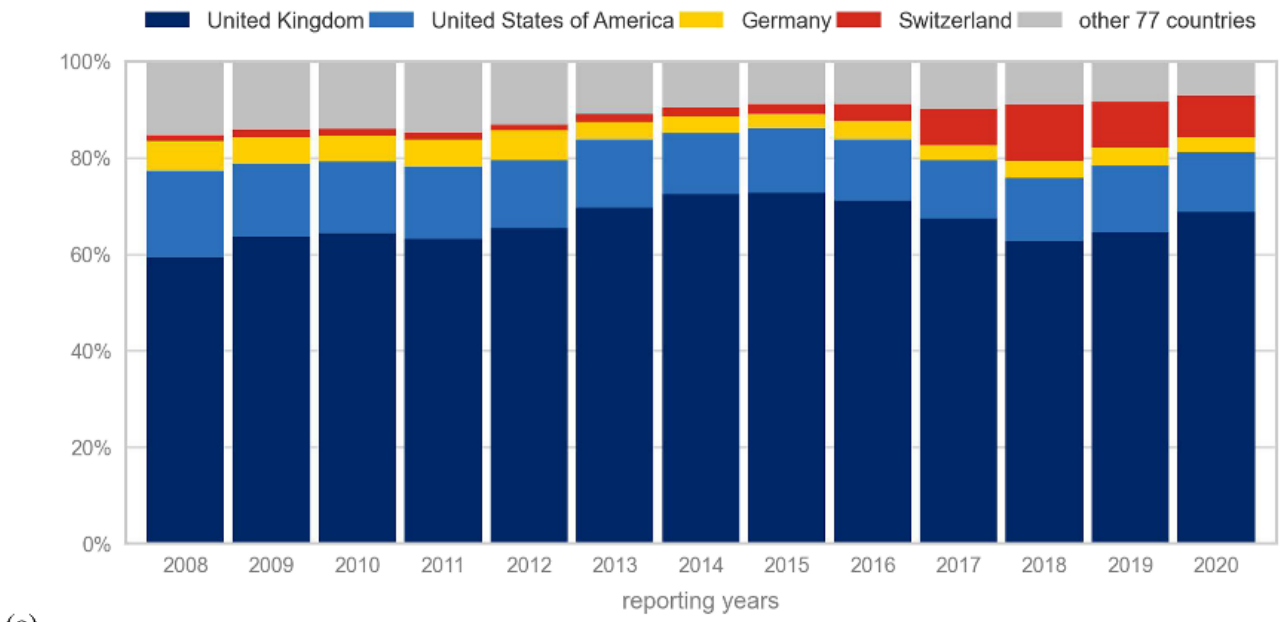
According to Lithuania's research assessment policies, institutions receive several times more funding points for books issued by prestigious publishers, but only foreign publishers can be awarded this highest rank. In the following section, I will explore whether politicians have succeeded in incentivizing Lithuanian researchers to utilize foreign publishers.

5.4.3. Countries where ISBNs were registered

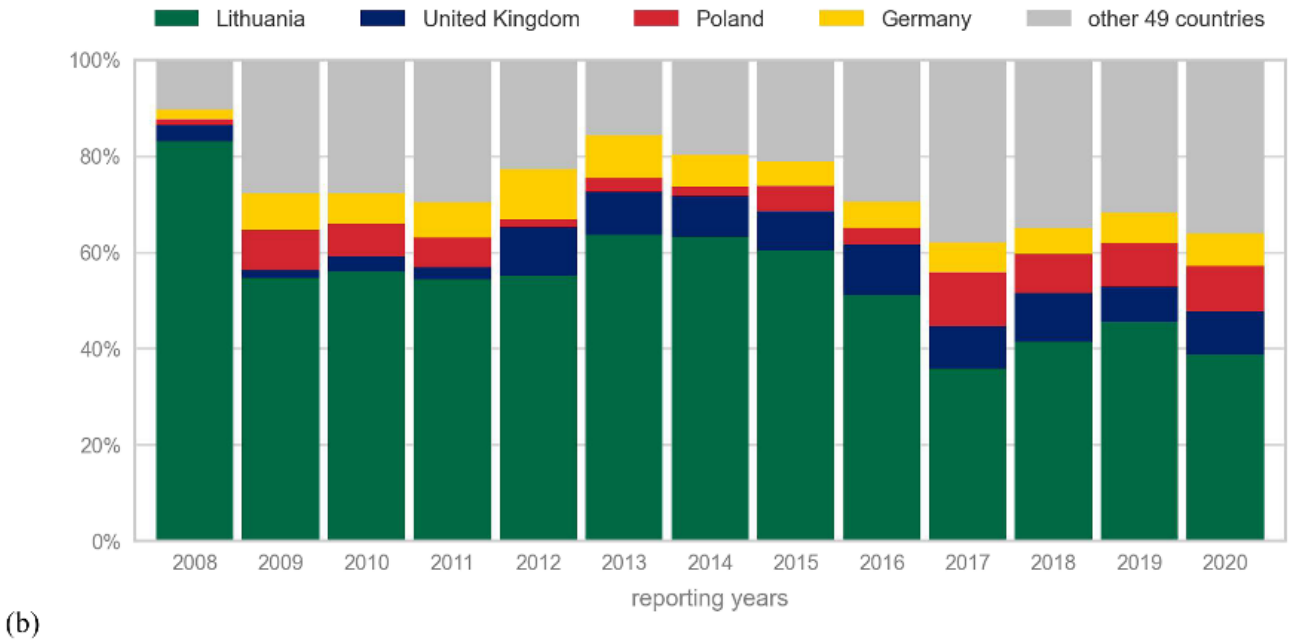
Because every prefix in the GRP metadata indicates only one country, analysing where ISBNs were issued was straightforward. The ISBNs of the 38,050 British books in the data set were assigned in 81 countries, but more than 98% of the REF-submitted books were published in Europe, which echoes results from another report (Tanner, 2016). British publishers produced 60–70% of all outputs over the years, and U.S. publishers issued more books than the publishers in the remaining 77 countries nearly every year. Figure 16 shows the results for the top four and other countries.

The Lithuanian results show ISBNs for 5,199 books registered in 53 countries. The portion of books published domestically plummeted in 2009, when only books in the sciences issued by prestigious foreign publishers became eligible for the annual research assessment. Since then, the number of domestically published books has slowly decreased year by year. In 2020, only 39% of books submitted for yearly research evaluation were produced in Lithuania.

A quote from an interview with a UK researcher, "I wanted to publish in the States, and ideally with a university press" (Butchard, Rowberry, and Squires 2018), encouraged me to examine with whom UK and Lithuanian researchers publish their books locally and abroad. Figure 17 shows the distribution of ISBN registrant categories in each of the seven randomly chosen countries, along with aggregate figures for the remaining countries.



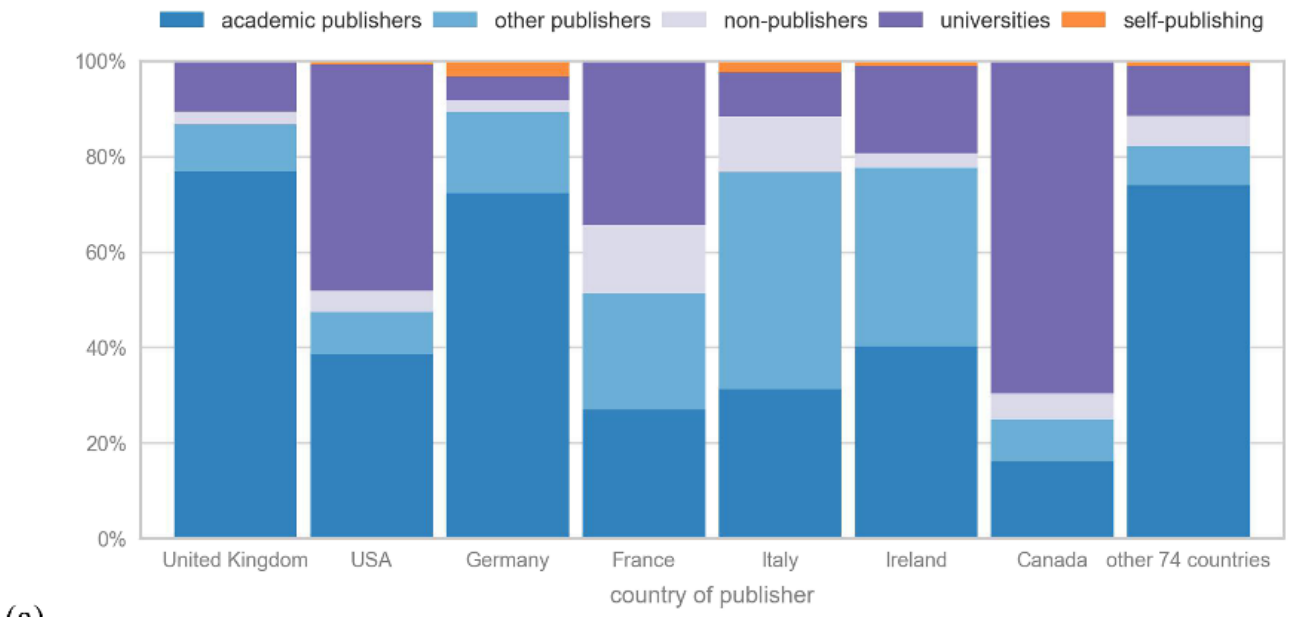
(a)



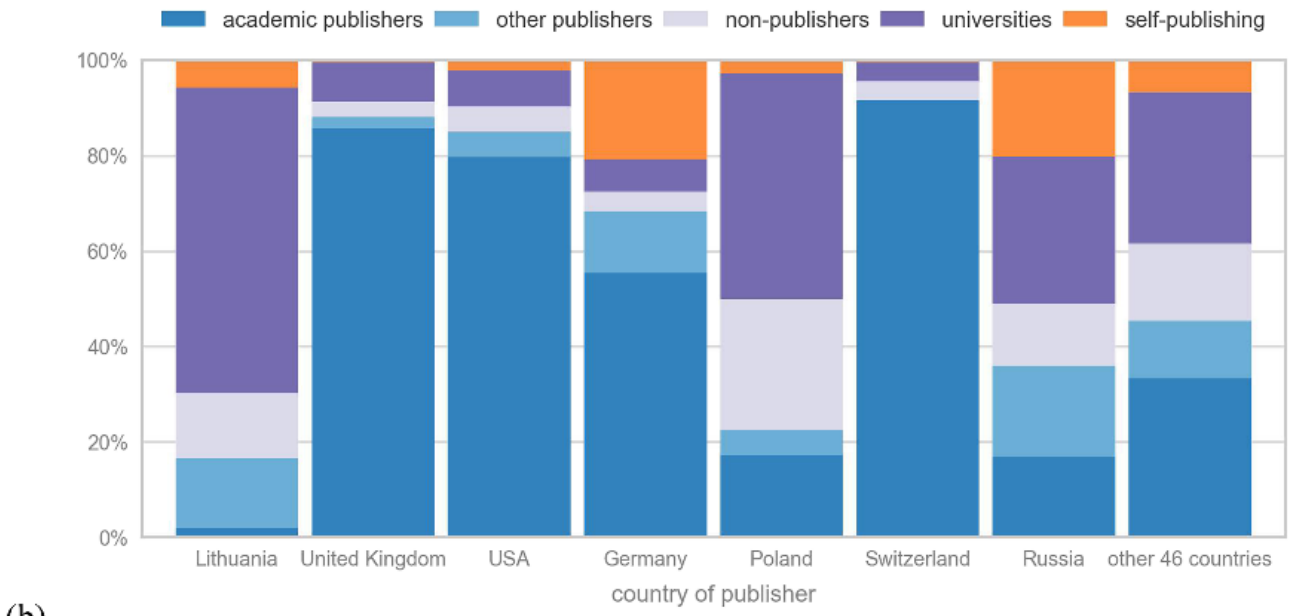
(b)

Figure 16. Share of books in (a) the United Kingdom and (b) Lithuania by country of book publishers.

For books submitted to the UK REF, British universities accounted for only 10% of the books published in the United Kingdom, whereas universities in Canada, the United States, and France accounted for a much larger share of the books issued in those countries. This indicates that British researchers published their books with universities in those countries more often than with academic publishers. By contrast, for books submitted to the Lithuanian research assessment system, Lithuanian universities published over 60% of the domestically published books. In Poland, Russia, and the remaining 46 countries, universities also accounted for a large share of the Lithuanian books published.



(a)



(b)

Figure 17. Distribution of books in (a) the United Kingdom and
(b) Lithuania by country of publisher and by publisher type within each country.

5.6. Discussion and conclusions

The motivation for this research was to explore whether the ISBN Manual and the GRP can be used to develop an in-depth understanding of book publishing practices, and more specifically, whether the requirements of research assessment systems align with the standards of the book publishing industry.

I summarize the answers found to the four research questions presented in the introduction.

RQ 1: Using the ISBN Manual and the GRP, is it possible to determine the genre of a book?

The systematic analysis of the ISBN Manual revealed that publishers, librarians, databases, and information managers seem to operate without defining the genres of academic books, even though research assessment regulations set requirements for numerous genres of books. The ISBN Manual declines to define the term *book*, instead naming types of works that are *not* eligible to be assigned an ISBN. As the manual provides no basis for distinguishing among book genres, research assessment systems asking for specific genres require something not standardized in book publishing. Academic organizations that deal in book genres must therefore take care to define those genres and include definitions in a convenient reference, such as the Frascati Manual[64]. This supports Basili and Lanzillo's (2018) suggestion that "academics and decision-makers could make further steps towards a pan-European framework for classification of research products in the SSH [social sciences and humanities]."

RQ 2: Using the ISBN Manual and the GRP, Is It Possible to Determine the Publisher of a Book and the Role the Publisher Has Played in Producing the Book?

The results show that the ISBN Manual defines book publishers' responsibilities as creating, producing, disseminating, and marketing digital or printed publications. According to the ISBN Standard, "The publisher is normally responsible for the content and for any financial risk involved in the process,"[65] meaning that a publisher is the person or entity responsible for initiating production and bearing the financial risk. However, this is not always the case for open-access books, where authors are usually copyright holders and publishing costs are covered by various sources. Further complexities can affect the development of book publishing, such as when institutions fund publications written by researchers in their employ (Ferwerda et al. 2017; Norwegian Association of Higher Education Institutions 2004). Irrespective of these issues, the ISBN registrant, responsible for making books publicly available, is one of many roles in book production apparent from the practicalities envisioned in the ISBN Manual. These registrants can be identified by publisher prefixes extracted from any book ISBN in the GRP.

It was possible to identify "parent" publishers using publisher prefixes and exploring their interrelationships in the GRP. In occasional cases, when GRP metadata does not capture every

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[64] Frascati Manual 2015: Guidelines for collecting and reporting data on research and experimental development <https://www.oecd.org/innovation/frascati-manual-2015-9789264239012-en.html> accessed 27 May 2023.

[65] ISO 2108:2017(en) Information and documentation—International Standard Book Number (ISBN) <https://www.iso.org/obp/ui/#iso:std:iso:2108:ed-5:v1:en> accessed on 27 May 2023.

twist and turn in the convoluted interactions between publishers, it is still possible to detect parent publishers by consulting additional sources of information, such as library catalogues and online search results.

Even though the ISBN Manual provides comprehensive explanations of the complex interactions within the book publishing industry, the way in which a book's publisher is defined in the ISBN system may be very different from the understanding of a publisher from a research assessment perspective. In countries where publishers are being ranked for research funding distribution, policymakers assume that the publisher of a book can be seen as an indicator of the book's quality. However, the ISBN system offers a great deal of flexibility in who can assign ISBNs and be seen as book publishers—in essence, anyone can be a book publisher in the ISBN world. Awareness of this flexibility is crucial for designers of research policies and committee members who seek to assess research outputs consistently and fairly.

RQ 3: Can the GRP be used to determine the primary activities of book publishers?

Researchers may publish their books with many different types of publishers: universities, academic publishers, or other actors, such as libraries, research institutions, or publishing services firms. My results show that GRP metadata on book publishers (such as website URL and contact details) can be used to identify whether publishers are universities or higher education institutions, dedicated academic or commercial publishers, or organizations whose main mission lies outside book publishing.

RQ 4: Can the GRP Be Used to Develop an In-Depth Understanding of Researchers' Book Publishing Practices?

Answering this question may help to establish book assessment criteria suitable for national use. My empirical investigation demonstrates that GRP metadata can be used for bibliometric analysis. Moreover, this source of ISBN metadata is free for registered users and easy to use. As the GRP is maintained by the International ISBN Agency, it is a reliable source for obtaining insights into book publishing practices.

Implications for Research Assessment Practices

The findings of this study have several practical implications for bibliometric analysis and book evaluation. For bibliometric analysis, the findings provide a new understanding of the ISBN as a meaningful digital code for which firs-hand metadata is freely available in the GRP. It is worth exploring other metadata sources available for ISBNs, such as WorldCat or other library catalogues, which might be the perfect complement to the GRP metadata. For book evaluation, the findings suggest not relying on book publishers' reputations but paying more attention to actual book publishing practices and their fit into the needs of future scholarly communication, as explained for instance in the Vienna Principles (Kraker et al. 2016). One of these principles, "scholarly communication should be immediately and openly accessible by anyone," has already been addressed by UK policymakers and is being widely discussed in the United Kingdom. Future research may demonstrate how the Vienna Principles can be incorporated in book evaluation policies.

The most obvious finding to emerge from this study is the potential of ISBN codes and the Global Registry of Publishers as sources of book metadata for scientometric analysis, policymaking, and the development of book metrics. By using ISBN codes and their open metadata in the Global Registry of Publishers, scientometricians can access reliable and firsthand information on the characteristics and provenance of books. The results of this study can inform experts and policymakers about the practicalities of the book industry and contribute to the improvement of research assessment practices. In addition, this study can also provide valuable insights for developers of book metrics, who can use the results to enhance their existing indicators or to create new ones that can then be used by experts in book evaluation.

Chapter 6.
Mapping scholarly books:
Library metadata and research assessment

This chapter is based on:

Dagienė, E. (2024a). Mapping Scholarly Books: Library Metadata and Research Assessment. *Scientometrics* 129, 5689–5714. https://doi.org/10.1007/s11192-024-05120-1

6.1. Introduction

Current research assessment policies in Lithuania prioritise book publication with prestigious publishers to maximise visibility and internationalisation of national research. However, this "prestige economy", prevalent not just in Lithuania but worldwide, goes beyond inconsistencies in evaluation, neglecting the merits of individual books (Dagienė 2023a). New approaches, such as comprehensive book metrics, are needed to track individual books throughout their lifecycle.

This paper advocates for individual book assessment, aligning with the open science and responsible research evaluation principles outlined by UNESCO (UNESCO 2021), the European Commission (2019), and various declarations and guides (Collins et al. 2015; European Commission 2019a; Federation of Finnish Learned Societies et al. 2019; Kraker et al. 2016; Universities UK Open Access and Monographs Group 2019). While these principles are widely supported, they are often overlooked in research assessment practices, particularly with regard to books.

To adapt policies, policymakers require an awareness of the evolving book publishing landscape. Examining book metadata in library catalogues can offer valuable insights. Existing studies primarily focus on book citations; less is known about the broader impact of books. Yet to evaluate scholarly books comprehensively and responsibly, we need metrics that capture a book's full journey, from creation and dissemination to digital preservation. Existing metrics often lack this detail, highlighting the need for new approaches.

Many researchers have used data from WorldCat[66], the world's most comprehensive library catalogue, to explore book metrics. WorldCat holds extensive metadata for millions of books across thousands of libraries worldwide. This metadata is stored in MARC21 XML format, allowing researchers to analyse and utilise it efficiently. Examining this accumulated metadata can help identify practical issues such as collaborations in the book publishing industry and book metadata supply at both national and individual levels.

This study investigates the suitability of book metadata for evaluating individual books and analyses the visibility of nationally assessed books in WorldCat. Specifically, I address the following research questions:

RQ 1: Which book metadata elements required for research assessment systems are present in WorldCat and are suitable for evaluating individual books?

RQ 2: What is the level of visibility in WorldCat of books submitted to national research assessments, and who are the primary metadata suppliers?

In this empirical research, I used two datasets of ISBNs of books submitted as research outputs in the UK (Dagienė 2023c) and Lithuania (Dagienė 2023b) derived from a previous study on book evaluation (Dagienė 2024b). However, these questions might be tested using any other set of valid ISBNs and using this research methodology regardless of specific book assessment practices.

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[66] Inside WorldCat <https://www.oclc.org/en/worldcat/inside-worldcat.html> accessed on 22 July 2024.

This paper is structured as follows: Section 6.2 presents a literature review on the development of book metrics and their main data sources. Section 6.3 describes the research methodology and data sources for the empirical study. Section 6.4 addresses the first research question, providing insights into the most relevant book metadata required for research assessment system and their equivalents in MARC21 XML format. Section 6.5 delves into book visibility in library catalogues and the main metadata suppliers for both UK- and Lithuanian-authored books. Finally, Section 6.6 summarises the findings, draws conclusions, and discusses implications for research assessment practices.

6.2. Literature review

Evaluating the impact of scholarly books presents a unique challenge compared to journal articles. In this section I review the literature on metrics and approaches for assessing the impact of scholarly books, moving beyond sole reliance on citation counts to consider diverse indicators such as book reviews, library holdings, online platforms, and altmetrics. By examining these diverse perspectives, I aim to provide a holistic understanding of the current state of book impact assessment and identify potential future directions for research.

6.2.1. Book citation metrics

At the beginning of book metric exploration, researchers attempted to assess book impact through *book citations*, as they did for peer-reviewed journals. Perhaps the first and most frequently used databases to explore book citation impact were the Science Citation Index and the Social Sciences Citation Index (Butler and Visser 2006; Cronin, Snyder, and Atkins 1997).

Further research emerged after the Book Citation Index (BKCI) was added to the Web of Science Core Collection (Gingras and Khelfaoui 2019; Gorraiz, Gumpenberger, and Purnell 2014; Gorraiz, Purnell, and Glänzel 2013; Zuccala et al. 2018). The launch of the BKCI has led scholars to identify differences between monographs and edited volumes, and between book series and annual series (Leydesdorff and Felt 2012).

Since then, research on book citation impact has become more complex in the range of sources it considers (Halevi et al. 2016; Linmans 2010; Zhou and Zhang 2021; Zuccala and Robinson-García 2019). In addition to well-established data sources, researchers have examined whether *Google Books*, *Google Scholar*, and *Scopus* (Kousha, Thelwall, and Rezaie 2011) or book mentions and citations in *Wikipedia* (Kousha and Thelwall 2017) can potentially be considered as a valuable measure of citation impact for book-based disciplines.

6.2.2. Book reviews

As complementary metrics to book citations, researchers have gradually explored *book reviews* to measure the impact of scholarly books. Among those studied to date are reviews indexed in the *Web of Science databases* (Gorraiz et al. 2014), book reviews published in *a particular journal* (Zuccala, van Someren, and van Bellen 2014), and book reviews sourced from *Choice Reviews Online* (Kousha and Thelwall 2015; Zhou and Zhang 2020).

Researchers have also examined online reviews from *Amazon* (Kousha and Thelwall 2016) and *Goodreads*, together with their ratings, for impact assessment (Kousha, Thelwall, and Abdoli 2017). They found that both can be used as evidence of the impact of popular academic books in the arts, the humanities, and, to some degree, the social sciences, although they cautioned that qualitative research is needed to verify their quantitative findings.

6.2.3. Library holdings and metrics

Library holdings have served as yet another way for scientometricians to measure book impact. Often referred to as catalogue inclusions (Torres-Salinas and Moed 2009) or libcitations (White et al. 2009), they can potentially address some of the most glaring shortcomings of citation analysis.

Researchers have compared library holdings with citations across various databases Linmans (2010), while testing new indicators for humanities, introduced library holdings from WorldCat. He derived citations from Web of Science, the library holdings from WorldCat, and the productivity data from METIS, a Dutch database covering research output. Linmans suggested that "the citation counts for books supplied by Google Scholar will be of great value".

Building on this, Cabezas-Clavijo et al. (2013) examined correlations between library loans in university libraries and citations in Google Scholar and Web of Science databases. Zuccala & White (2015) investigated whether libcitations in WorldCat correlate with citations in Scopus. After further research, they concluded that numerous libcitations may not necessarily signal high-quality books (White and Zuccala 2018).

6.2.4. Broader impacts of books

Researchers have also combined information on library holdings with additional book metadata. For instance, in studies aimed at ranking scholarly book publishers, researchers first pinpointed book titles cited in Scopus history journals, then juxtaposed the extracted book metadata with that in WorldCat, which includes library holdings (Zuccala and White 2015). In a recent study, the researchers utilised both library holdings in WorldCat as a visibility indicator and citations in Google Scholar to measure the academic impact of books (Zuccala et al. 2021).

Many studies have analysed the broader impacts of books. In one investigation, researchers evaluated impact via meticulous analysis of citation literature. They employed three indicators: sales on amazon.co.uk; at least one citation on Google Books, Google Scholar, or Scopus; and library holdings on WorldCat (Zhou and Zhang 2021). In a separate study, Maleki (2022) modelled the relationships between print and electronic book format holdings, book citations, and altmetrics. This helped to draw out various aspects of impact made by printed and electronic books.

6.2.5. WorldCat and OCLC data

Among bibliographic databases, WorldCat, maintained by OCLC, has become the main source for data on library holdings and other book-related research. In addition to collecting library holdings, researchers (Halevi et al. 2016) have employed OCLC's book classification system to allocate books to their appropriate subject areas.

To examine whether Lotka's law for literary author productivity holds true, Friedman & Bernstein (2017) analysed the number of bibliographic records in WorldCat associated with famous authors. Other studies (Tausch 2023; Torres-Salinas, Arroyo-Machado, and Thelwall 2021; Zavalin 2023) analysed author productivity using publication records, investigated subject classifications, and explored research trends using various data points. Although WorldCat Identities is now discontinued, users can continue exploring similar data through WorldCat Entities[67].

6.3. Research design

I took a mixed-methods approach to explore book metadata associated with research outputs in the UK and Lithuania. For the empirical analysis, I used ISBNs sourced from national research assessments: 38,050 ISBNs from the UK's REF 2014[68] and REF 2021[69] (Dagienė 2023c) and 5,199 ISBNs from Lithuania's annual assessments (Dagienė 2023b). The years 2008–20 were aligned to ensure comparable representation of the findings from Lithuanian and UK data.

First, I manually reviewed randomly selected ISBNs from UK and Lithuanian (LT) books in WorldCat. Later, I quantitatively analysed metadata of all ISBNs in both national datasets, extracting the available metadata from particular MARC21 fields in the datasets provided by OCLC.

6.3.1. Evaluating WorldCat book metadata elements for individual books

To answer the first research question and determine what types of book metadata are required for research assessment systems, are suitable for evaluating individual books, and are present in WorldCat, I manually searched through book metadata using 180 randomly selected ISBNs: 90 each from the 37,641 records available in the OCLC databases for REF books and the 3,666 records for LT books. These ISBNs were used to screen the publicly accessible WorldCat bibliographic catalogue[70]. The focus was on evaluating the availability of book metadata mandated for research assessments, which typically require institutions to submit data to research evaluation systems.

Primary book metadata usually encompasses elements such as author, title, publisher, language, year of publication, and ISBNs. Although ISBN codes are machine-readable, have

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[67] WorldCat Entities <https://entities.oclc.org/worldcat/entity> accessed on 22 July 2024.

[68] REF2014 <https://www.ref.ac.uk/2014> accessed on 22 July 2024.

[69] REF2021 <https://results2021.ref.ac.uk> accessed on 22 July 2024.

[70] WorldCat catalogue <https://www.worldcat.org/> accessed on 22 July 2024.

the potential for automated validation, and can be used to obtain book metadata from various sources, some research evaluation systems do not give them enough credit (Dagienė and Li 2021). The UK's REF, which already mandates and automatically verifies ISBN codes, stands as an exception.

Beyond primary metadata, such as title, author, or ISBN, WorldCat also offers additional metadata. In this study, the exploration of this additional metadata commenced with advanced searches, entering the selected ISBNs, and specifying the intention to locate a particular record. The first title presented in the search results was chosen, and its associated metadata fields on the opened webpage were meticulously examined.

Subsequent exploration of available metadata types began by selecting 'Edition: View all formats and editions' on the newly opened webpage. The investigation aimed to determine whether WorldCat contains any additional metadata pertinent to current research assessment requirements, including open access status, or that could shed light on prevailing practices of scholarly knowledge production, review, organisation, dissemination, and preservation—stages identified as the most important for the future of scholarly communication (Kraker et al. 2016).

It is important to acknowledge that the WorldCat website has been subject to changes since the time of this research project. For instance, after a recent update, the website lacks the 'Responsibility' field, formerly a valuable asset due to its relevance to research assessments that necessitate peer review information for scholarly books.

6.3.2. Analysing OCLC MARC21 metadata for completeness of national datasets

To address the second research question regarding the level of visibility in WorldCat of books submitted to national research assessments and the identities of primary metadata suppliers, I delved into book metadata provided by OCLC in the MARC21 format. This allowed me to analyse the quantities of book metadata elements in national datasets.

I obtained the relevant metadata by submitting ISBNs to the OCLC team and requesting all available metadata for those ISBNs. The provided data arrived in two instalments: December 2021 (covering years 2008–14) and December 2022 (covering years 2015–20). Selection of ISBNs for LT books aligned with the corresponding years.

While OCLC processed both sets of MARC21 XML files as a combined entity, prior research has documented a noticeable English language bias in WorldCat's coverage (Torres-Salinas et al. 2021; Wakeling et al. 2017). Therefore, I conducted separate analyses examining metadata availability and completeness for books authored by researchers from the UK and Lithuania.

Book metadata in MARC21 format facilitates machine-readable representation and communication of bibliographic and related information. The specific OCLC MARC21 XML structure employs numerous fields and subfields, each corresponding to distinct book metadata elements. OCLC provides a comprehensive explanation of MARC21 fields in its

online training and support documentation[71]; a further series of OCLC web pages illustrates the usage of the individual MARC tags[72].

I began investigating the empirical MARC21 data provided by OCLC identifying the fields that have every record in the datasets. Notably, a consistent subset of five fields (001, 008, 020, 040, and 245) appeared across all REF and LT records within the OCLC databases. These fields play a critical role in book identification and description, while others may be absent from specific entries or lack subfields containing the desired metadata elements.

Fields 001 and 008 are mandatory for all OCLC MARC21 records. Field 001 acts as a control field, while field 008 is a fixed-length control field containing elements common to all MARC formats, often referred to as the "leader". For instance, leader positions 35–9 hold the language code, indicating the primary language of the catalogued item (see subsection 6.4.2). Additionally, leader positions 7–10 contain two dates, with the first representing the publication year. Notably, OCLC employs a structured field system with fixed width, allocating four positions for the year in YYYY format within the MARC21 leader (see subsection 6.4.3).

Field 020 is specifically designed to record the ISBN for the particular book. In some cases, this field may contain subfields indicating invalid or cancelled ISBNs, such as those with incorrect check digits or mismatches with the catalogued item. Furthermore, field 020 may be repeated to capture all ISBNs associated with the specific ISBN, potentially identifying different editions or parts linked to the book. While I do not explore this aspect in detail here, it may hold significance for research assessment system developers.

Field 040 serves to identify the organisations responsible for creating, maintaining, or modifying each bibliographic record. This field and its subfields provide valuable information regarding the provenance of the record, aiding in understanding its context and credibility. Multiple codes may be present within the field, each representing an organisation involved in the development of the record (see subsection 6.5.2).

Field 245 functions as the primary container for title information, playing a pivotal role in accurately representing the title and authorship of a book within the MARC21 XML metadata. Field 260 primarily deals with aspects related to the publication, distribution, acquisition, etc. of the book, complementing the title information found in field 245 (see subsection 6.4.1).

It is important to reiterate that MARC21 formats encompass a vast array of elements potentially applicable to research assessment systems or monitoring open access policy implementation. However, the subsequent sections will focus solely on the fields that are most clearly relevant to research assessment policies.

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71 Bibliographic Formats and Standards. OCLC <https://www.oclc.org/bibformats/en.html> accessed on 22 July 2024.

72 MARC tags details. OCLC <https://help.oclc.org/Library_Management/OLIB/Data_import_and_export/MARC_tags_details> accessed on 22 July 2024.

6.4. Key book metadata elements for research assessment

Research assessment requirements vary across countries, prompting diverse interests among experts evaluating book outputs. These interests depend on the specific metadata that open access and national research evaluation policies demand.

Simulating the experiences of experts evaluating individual books or analysing national achievements, this section explores key metadata elements within WorldCat and MARC21 XML data, answering the first research question: Which book metadata elements required for research assessment systems are present in WorldCat and are suitable for evaluating individual books?

6.4.1. Book titles, authors, and variety of contributors

WorldCat draws upon MARC21 data fields to present key book metadata elements such as titles and contributors. While these elements might appear unique, experts navigating WorldCat may encounter slight variations (Figures 1–2).

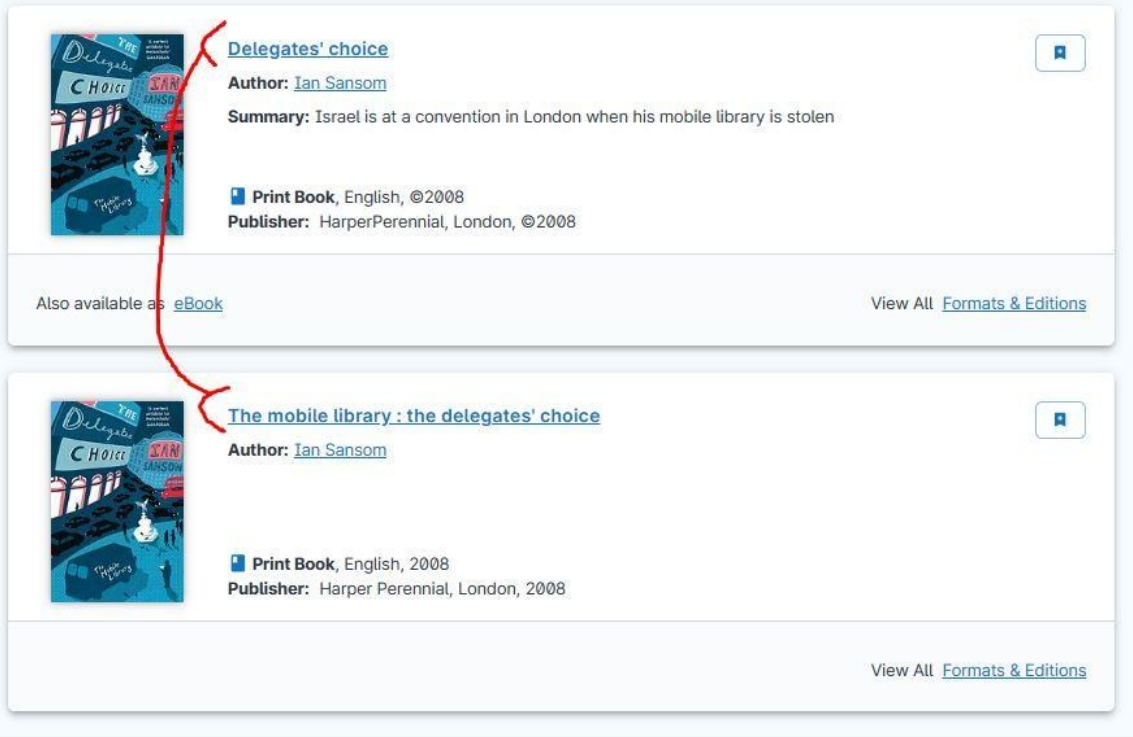


Figure 1. An example of different titles for the same book (ISBN 9780007255344).

Notably, the "Author" field can offer valuable insights, showcasing not only the book's writer(s) but also individuals who played contributing roles such as "Translator", "Writer of Introduction", or "Degree Supervisor". The composition of the "Author" field can also vary depending on the book's genre, edition, or format, as illustrated in Figure 2.

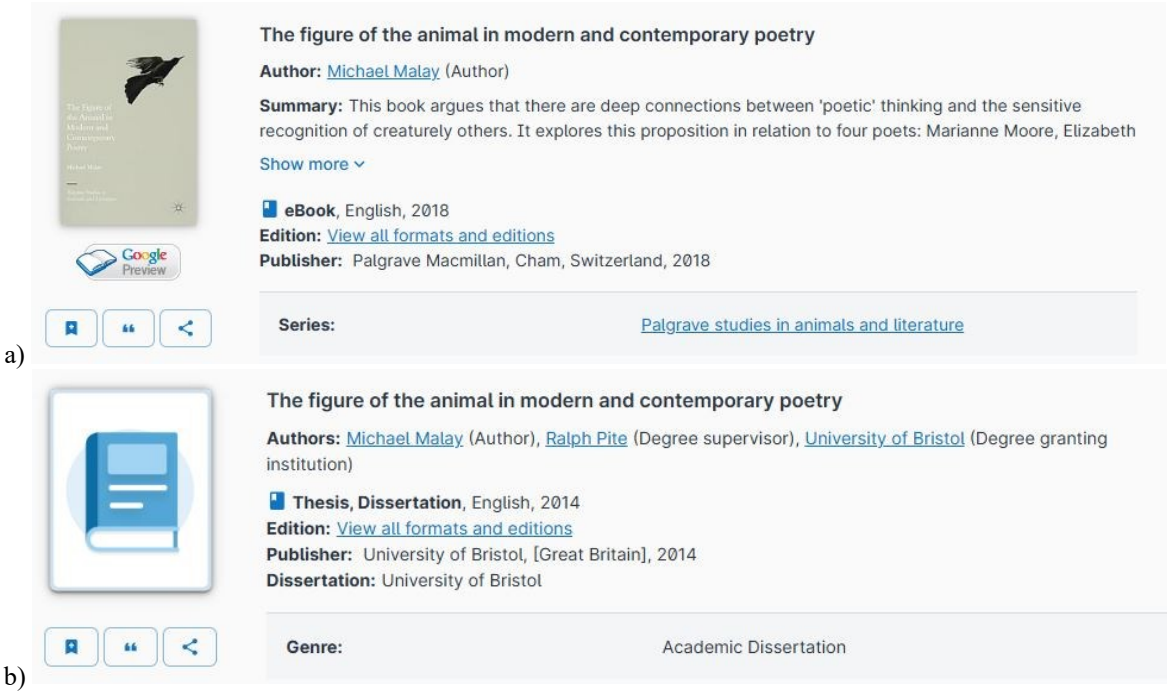


Figure 2. An example of different compositions of the "Authors" field depending on the book genre or format: (a) one author when selecting the printed book and (b) more contributors when selecting "Thesis, Dissertation" format (ISBN 9783319706658).

Figure 3 presents an intriguing example from the Lithuanian sample, highlighting an academic who serves as both author and publisher. WorldCat identifies this researcher in both roles. Further verification through the Global Register of Publishers confirms her registered status as a Polish publisher. However, despite the listed affiliation, search engines revealed neither a dedicated website for the publishing company nor concrete evidence of the researcher's ownership, though they did surface a published interview (Lamanauskas 2017). This interview reveals the publisher's affiliation with the university that is mentioned among the contributors without a specific role designation. This case underscores the comprehensiveness of WorldCat in displaying all contributors identified in MARC21 data.

Figure 3. An example of contributor metadata revealing a self-published book (ISBN 9788394810429).

Analysing the underlying MARC21 data, I found that *book titles* for both REF and LT books primarily originated from field 245a, with only 0.06% of all books missing title metadata. Notably, these missing titles were primarily in languages other than English, subsequently incorporated into WorldCat manually.

However, the picture for *author* and *contributor* data, primarily sourced from field 245c, is slightly different. Here, a more substantial data gap exists, with missing information for 11.9% of REF books and 10.1% of LT books. To address these gaps, I employed manual checking and merged data from various designated fields (100, 110, 700, etc.). While this process improved completeness, the extracted data often required further cleaning and standardisation for accurate author-specific analyses.

Overall, while WorldCat offers valuable information about book titles, authors, and contributors, users should be mindful of potential inconsistencies and limitations in the data. Manual intervention and further cleaning may be necessary for specific analyses, particularly those focusing on individual authors or contributors.

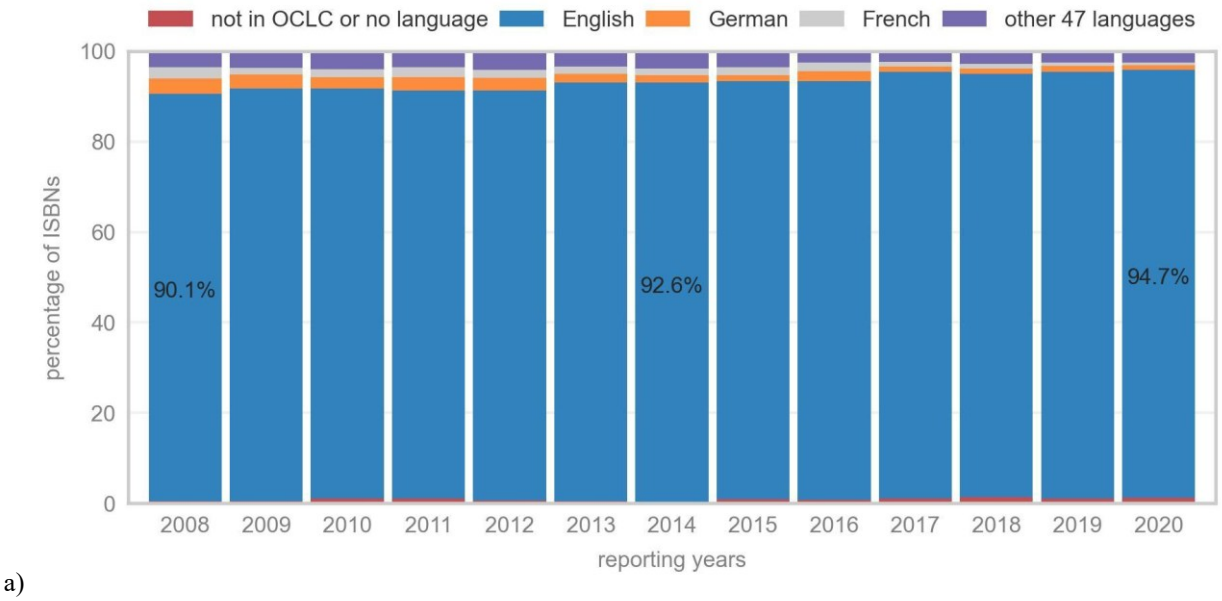
6.4.2. Book language: Representation and trends

WorldCat prominently displays book languages, allowing users to quickly identify the primary language of a work. For multilingual books, separate records may exist (Figure 4), highlighting diverse contributions and intellectual origins as well. The information on languages is further encoded within the mandatory MARC21 "leader" field (positions 35–7) using three-letter language codes.

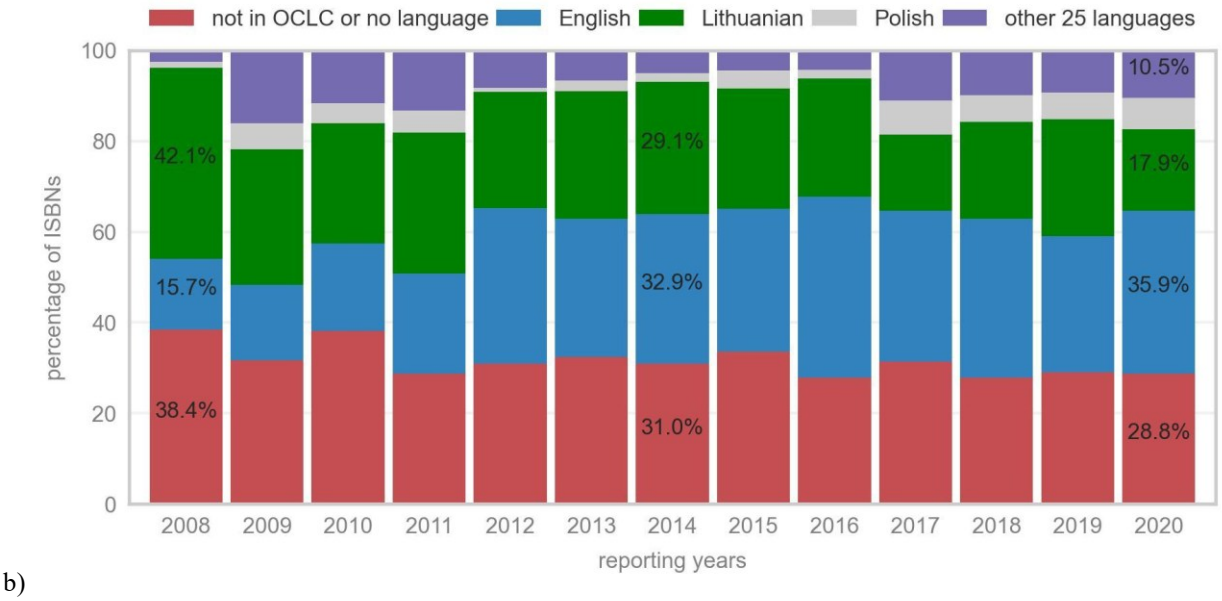
Figure 4. Split records for the same book highlight multilingualism (ISBN 9789955185611).

While REF books were written in 48 languages and LT books in 26, a relatively small portion lacked clear language identification: 0.83% of REF records (313 of 37,641) and 0.76% of LT

records (28 of 3,666). These ambiguities stem from the limitations of the three-letter code system, which can represent various meanings such as "Undetermined" or "Multiple languages".



a)



b)

Figure 5. Top three vs. other languages with annual trends for (a) REF and (b) LT books.

Additionally, collective codes indicate broader language groups (e.g. Slavic or Romance), making precise identification difficult if the particular languages are not further specified. Fortunately, MARC21 field 041 offers more detailed language information, though my investigation found that many records with unclear leader codes lacked corresponding details in this field. This highlights the potential inconsistencies and gaps within available metadata, but only for less than 1% of all national records. Figure 5a illustrates that over 90% of REF books have been published in English, while the percentage of books in German and French is declining. Figure 5b reveals a significant decline in the number of books in Lithuanian from

42.1% to 17.9% between 2008 and 2020, while English publications doubled during the same period. This trend might be partly explained by national research assessment policies that incentivise publishing with "prestigious" foreign publishers, who often publish in English.

Altogether, this analysis of book languages in WorldCat and MARC21 metadata yielded valuable insights into language trends within research publications, despite some missing data. The data confirms the great predominance of English in REF books while illustrating the growing tendency towards bilingual publishing among Lithuanian institutions, where English is gaining ground alongside Lithuanian. This shift warrants further exploration to understand the driving factors, such as national research assessment policies, and their potential impact on the visibility and accessibility of research outputs.

6.4.3. Publication year: Completeness and challenges

While the content of a book holds more weight than its publication date in expert evaluations, accurate publication years remain crucial for bibliographic research and identifying trends across specific timeframes. Like in an earlier study (Dagienė 2024b), in this paper I rely on publication years reported by institutions during research assessment submissions. However, the results show that reporting years are not always the same as the publication years found in library catalogues.

Fortunately, union catalogues such as WorldCat (MARC21 metadata) offer a reliable alternative source for publication year information. The mandatory MARC21 fields hold publication year data, making them ideal for retrieval. The MARC21 "leader" field emerges as the primary and most comprehensive source for publication years, offering an impressive coverage of 99.2% for REF books and 97.5% for LT books available in the OCLC databases. I identified only minor discrepancies due to variations in data format and the presence of manually entered mistaken information. This highlights the crucial role of MARC21 metadata in ensuring data completeness and accuracy for bibliometric analyses.

Field 260c, serving as an additional source for languages other than English, contained publication years for a third of REF books and two-thirds of LT books. Unstandardised manually recorded publishing and copyright dates made the data in this field inconsistent and difficult to process automatically, though it remains helpful in cleaning and complementing the years obtained from the "leader" field.

With up to 1% of OCLC entries missing year data overall, comparing the reported years with those retrieved from OCLC reveals a substantial level of agreement: 78.0% for REF books and 79.9% for LT books. Nevertheless, some discrepancies exist, involving publications that occurred earlier or later than the reported dates. 18.8% of REF and 17.2% of LT books were published one to three years earlier than the dates reported by institutions, while 3.0% of REF and 1.7% of LT books were published one to three years later than the dates reported by institutions (delayed publications).

These discrepancies notwithstanding, the analysis of MARC21 metadata within library catalogues holds valuable potential for retrieving more accurate publication years for almost

all the REF and LT books available in OCLC. However, exploring alternative data sources remains necessary for the one-third of LT books not included within the OCLC databases.

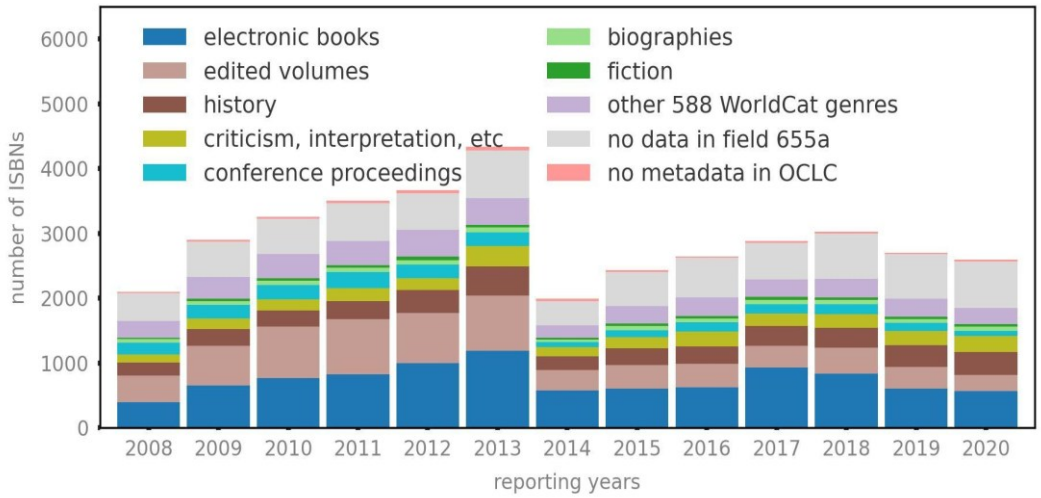
6.4.4. Book genres: Challenges in standardisation and consistency

The UK's REF policies define books as long-form research outputs, but in some countries, including Lithuania, diverse types of books play a significant role in research assessments. Policies may prioritise specific genres, often without unambiguous definitions or standardised application across contexts. Bibliometricians have investigated these practices, highlighting the inconsistent interpretation of terms such as "(scholarly) monograph" by different stakeholders, including policymakers, academics, publishers, and librarians (Clemens et al. 2010; Dagienė 2024b; Sīle et al. 2021; Zuccala et al. 2018; Zuccala and Cornacchia 2016).

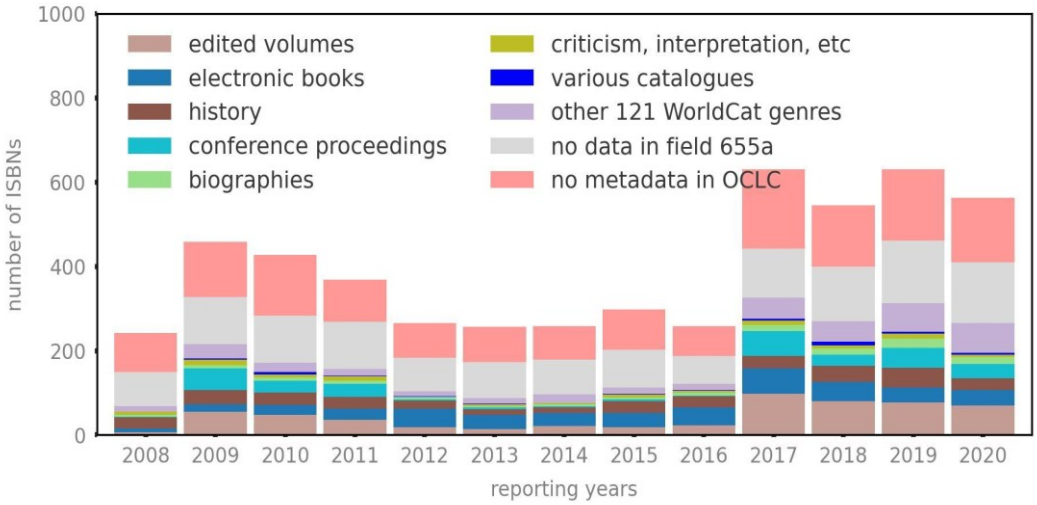
Research evaluation requirements often diverge from the publishing industry standard: the ISBN Manual (International ISBN Agency 2017) lacks definitions for "book", "book genre", or even "scientific monograph." Conversely, library cataloguing rules (International Federation of Library Associations and Institutions (IFLA) 2009) define a book as a "work" representing an "intellectual or artistic creation", with variations such as translation considered a separate "expression". The physical manifestation of an "expression" can be diverse, encompassing print, electronic formats, and other media. This suggests that publishers and library catalogues may not readily capture book genres in the way book assessment protocols perceive them.

Analysing REF and LT book samples in WorldCat, I found a wide variety of terms in the "Genres" field: "academic dissertation", "novels", "conference papers", "biographies", "poetry", and many others in different languages. Exploring the completeness of genre metadata for these books, I extracted data from MARC21 field 655a, "Genre/Form", which is optional; consequently, 25.2% of REF and 59.0% of LT books had no such field in their MARC21 records. Even where data existed, hundreds of unique words in multiple languages described not only typical genres but a diversity of forms, characteristics, and indeed categories, though the latter were not necessarily genres eligible for Lithuanian research assessment. As recognised earlier, the REF policies require long-form research outputs but do not stipulate specific genres for submission.

Figure 6 shows the 7 most prevalent genres among the REF and LT books identified in MARC21 field 655a. In the Lithuanian data, we see a mismatch between the top identified genres and those required by national research evaluation policy. Formats such as "electronic books" and "edited volumes" dominate, while "monographs" are rare.



a)



b)

Figure 6. Top 7 vs. remaining genres for (a) REF and
(b) LT books identified in MARC21 metadata field 655a.

Prior to this research, I expected large, globally recognised publishers to handle book metadata and provide it to library catalogues. Based on this belief and my previous research, showing that UK and US publishers issued about 80% (and the top 10 publishers roughly 60%) of all REF-assessed books (Dagienė 2024b), I expected that the genres of REF books I obtained from MARC21 would be predominantly in English. Surprisingly, the REF data revealed a variety of genres across multiple languages. Figure 7 shows that identifying categories such as “electronic books” or “conference proceedings” required aggregating records with various terms in German, Polish, French, and 26 other languages in which book metadata was supplied (see also subsection 6.5.2).

```
electronic_books = ['e-book download', 'e-book online only', 'e-books', 'ebook', 'ebooks', 'elecctronic books', 'elecronic books',
                    'electronic book', 'electronic books',  'elektronische publikation', 'elektronisches buch',
                    'elektronische publikation, publications électroniques', 'libros electronicos', 'libros electrónicos',
                    'livre électronique (descripteur de forme)', 'livres électronique', 'livres électroniques', 'livres numériques',
                    'livres num©ьriques', 'livres numériques', 'llibres electrònics', 'llibres electrònics',
                    'publications électroniques']

conference_proceedings = ['actas de congresos', 'actes de congrès', 'actes de congrès', 'conference "cultures and societies in the
middle euphrates and habur areas in the second millennium bc: scribal education and scribal traditions", 5-6 december 2013,
held in tsukuba, japan', 'conference materials', 'conference papers and proceedings', 'conference proceeding',
                    'conferences - meetings', 'conferencias', 'congresos', 'congresos, conferencias, etc', 'congress',
                    'congressen (vorm)',  'congresses', 'congresses (form)', 'congressi', 'congresso', 'congressos',
                     'congresverslag', 'congrès', 'congrès', 'konferenser', 'konferenz',  'konferenzschrift', 'konferenzschrift 2014',
                     'kongresi', 'kongress', 'kongress (zaragoza ; 2004)', 'kongress ca', 'kongreß', 'materiały konferencyjne',
                     'proceedings', 'proceedings of conferences']
```

Figure 7. Examples of terms found in MARC21 field 655a (reserved for genres) and used to count the number of electronic books and conference proceedings in the REF and LT books

The observed variations in genre terms highlight the lack of a single standard for genre assignment in book cataloguing. Additionally, misspellings and other errors suggest that some records were manually added.

The metadata also reflects national genre restrictions and their concomitant inconsistencies. For instance, the REF assessment process allows for submissions of various genres, including fiction and poetry, which appear among the top 20 genres identified in the UK data. However, Lithuanian research assessment policies restrict eligible genres, excluding fiction and poetry. The most highly valued, attracting significantly more funding points than other qualifying genres, are "scholarly monographs" and "collective monographs" (i.e. edited volumes published by "prestigious publishers"). In the Lithuanian data, only 17 books are classified as "monographs", but edited volumes dominate (Figure 6b).

The ambiguity surrounding the definition of 'scholarly monograph' in Lithuanian policies creates uncertainty in how anonymous experts decide on book genres and the associated funding points. Authors and domestic publishers often include genres on title pages, presumably to influence expert assessment. In light of this, it is unsurprising that of the thousands of books available in OCLC databases, only two REF books—but almost 300 LT books—have the word "monograph" in their MARC21 title data.

This analysis highlights the significant challenges associated with using book genres for research evaluation. Discrepancies exist between research assessment policy priorities, book publishing industry standards, and library cataloguing practices, leading to inconsistencies and ambiguities in genre data. Notably, formats such as electronic books often dominate, while genres explicitly required by policies (e.g. "scholarly monographs") are scarce. This mismatch creates dilemmas for researchers and book evaluators, raising concerns about fairness and effectiveness in research assessment.

Moving forward, further research is necessary to investigate the potential for standardised genre classification systems. Only by addressing these challenges can we ensure the reliable and consistent use of book genres for research assessment purposes.

6.4.5. Publishers: Complexities of collaboration and practice

In research evaluation, publisher prestige reigns supreme, yet the name alone can conceal a labyrinth of collaborations and practices. This subsection exposes the complexities behind the 'Publisher' field, revealing undisclosed partnerships and diverse publishing models that impact our understanding of scholarly works (Figure 8). Delving into WorldCat and MARC21 metadata reveals the challenge of identifying publishers and the need for more nuanced and effective research evaluation.

a)

b)

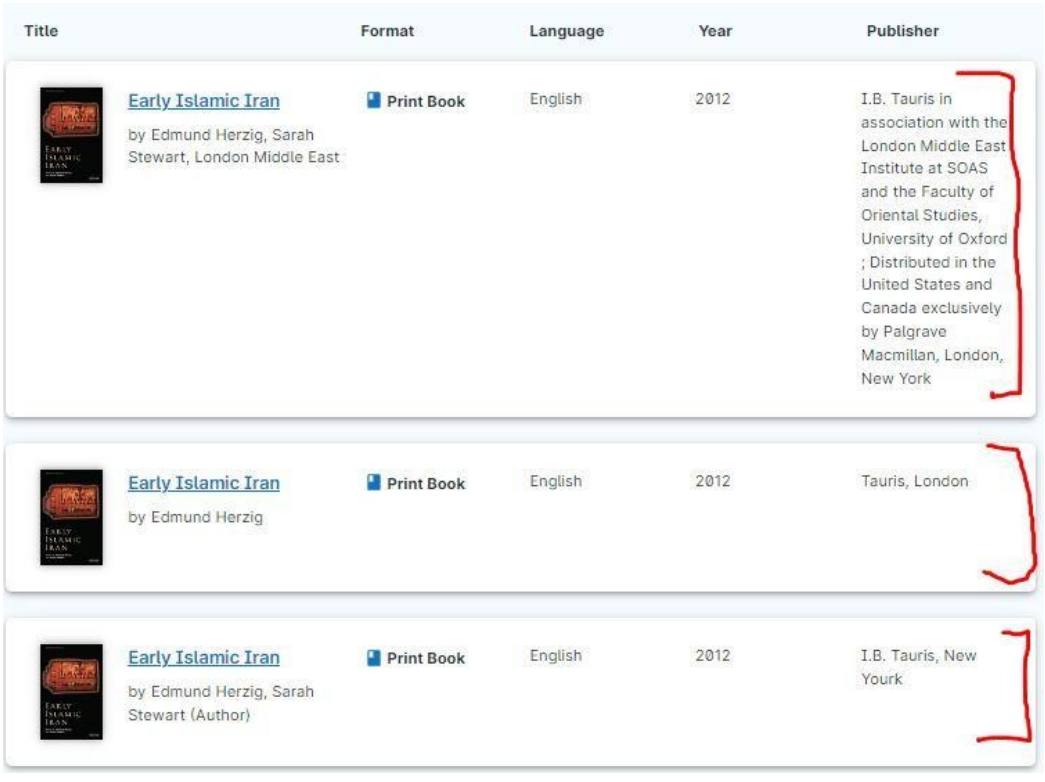


Figure 8. An example of a variety of 'Publisher' field names associated with the same book title: (a) ISBN 9780197264935 and (b) ISBN 9781780760612.

Figure 8a exemplifies this complexity, where one record lists only Oxford University Press, while another reveals its partnership with the British Academy. This obscurity intensifies in Figure 8b, showcasing a book with four collaborators: I.B. Tauris, the London Middle East

Institute, the Faculty of Oriental Studies at the University of Oxford, and Palgrave Macmillan. Evaluating such books solely based on publisher name (or prestige) becomes challenging, highlighting the need for deeper analysis. These are not isolated cases: numerous books exhibit similar discrepancies in their "Publisher" field details.

My exploration extended beyond the main "Publisher" field, uncovering valuable information hidden in the "Notes" and "More Information" sections. One book is credited to Crawford House Publishing, with "Notes" specifying a collaboration with the University of Cambridge Museum of Archaeology and Anthropology. Another listed Gandon Editions for Irish Architecture Foundation [and] Irish Architectural Archive, with "Notes" adding publication coinciding with an exhibition. Even ISBNs, often overlooked, unlock hidden connections.

Even more, WorldCat and MARC21 data of ISBNs in UK sample coupled with same ISBNs metadata from Global Register of Publishers revealed a network of partnership linking entities such as Gower, Ashgate, Routledge, the Hakluyt Society, MyiLibrary, and ProQuest. These findings underscore the crucial role of comprehensive data exploration in understanding diverse publishing practices.

A focus on book publication quality, professional digital formats, discoverability, and long-term preservation must take the place of traditional publisher prestige (Kraker et al. 2016). Current assessment often relies heavily on publisher reputation, but metadata reveals that societies, institutions, and museums often curate content before publishers become involved. This suggests focusing on the selection process and publication quality rather than solely on publisher reputation. Such a focus becomes even more critical when "Publisher" fields vary across editions due to mergers and acquisitions, as seen with a book (9781409432661, 9781283367738) whose successive editions were released by Ashgate (2011, 2012), Routledge (2016), and Taylor & Francis (2016).

While multiple ISBNs hint at undisclosed partnerships, the current process to identify them requires manual effort, highlighting the need for standardised and machine-readable metadata to fully comprehend the complexities of publishing practices. Disappearing imprints and changing publishers underscore the critical need for long-term preservation of scholarly books. This includes creating discoverable and freely accessible digital book versions, available in any language and distributed over the internet, even when the original publishers no longer exist. Such digitization ensures accessibility for future generations and aligns with the principles of open science. Additionally, the presence of multiple ISBNs suggests the involvement of various publishers depending on formats and editions, yet current metadata lacks information on the discoverability of digital publications. Further investigation and data enrichment are crucial for a more holistic understanding of the publishing landscape.

Progress towards standardisation has already been made. Rich MARC21 data with WorldCat Entities helps reveal contributors and connections invisible in an ordinary WorldCat search. Utilising metadata from the Global Register of Publishers can further simplify the abundance of publisher titles and imprints (Dagienė 2024). Integrating these resources, along with more comprehensive MARC21 data, presents promising opportunities for book metadata improvement.

By addressing these challenges and leveraging these opportunities, a more precise and comprehensive understanding of book outputs can be obtained, ultimately contributing to fairer and more effective research evaluation practices.

6.4.6. Forms of publication: Print vs. electronic, open access, translations, and editions

The REF sample presents a comprehensive cross-section of books, each with a plethora of editions, translations, and formats disseminated by various publishing houses. This diversity highlights the expansive nature of book metadata, which is readily accessible within both WorldCat and MARC21. To illustrate the vast scope of metadata accumulated over time, I will delve into the specific case of *The Lessons*, analysing the information available in WorldCat for individual book evaluation.

Classified in WorldCat as a fictional work within the "College Students England Oxford" subject area, *The Lessons* transcends publisher boundaries. Viking (an imprint of Penguin Random House), W. F. Howes (UK), and various French and Italian publishers have released various formats and translations. Assessing this work solely through its publisher would prove challenging. Viking released the first English edition in 2010, and subsequent editions followed in 2011 and 2018. Australian publisher Bolinda later issued an audiobook in 2019. Furthermore, the book received an Italian translation in 2020 and French translations across three editions published between 2010 and 2012 (Figure 9). This exploration of *The Lessons* metadata exemplifies the intricate web of publishers, editions, and languages that enrich the bibliographic landscape.

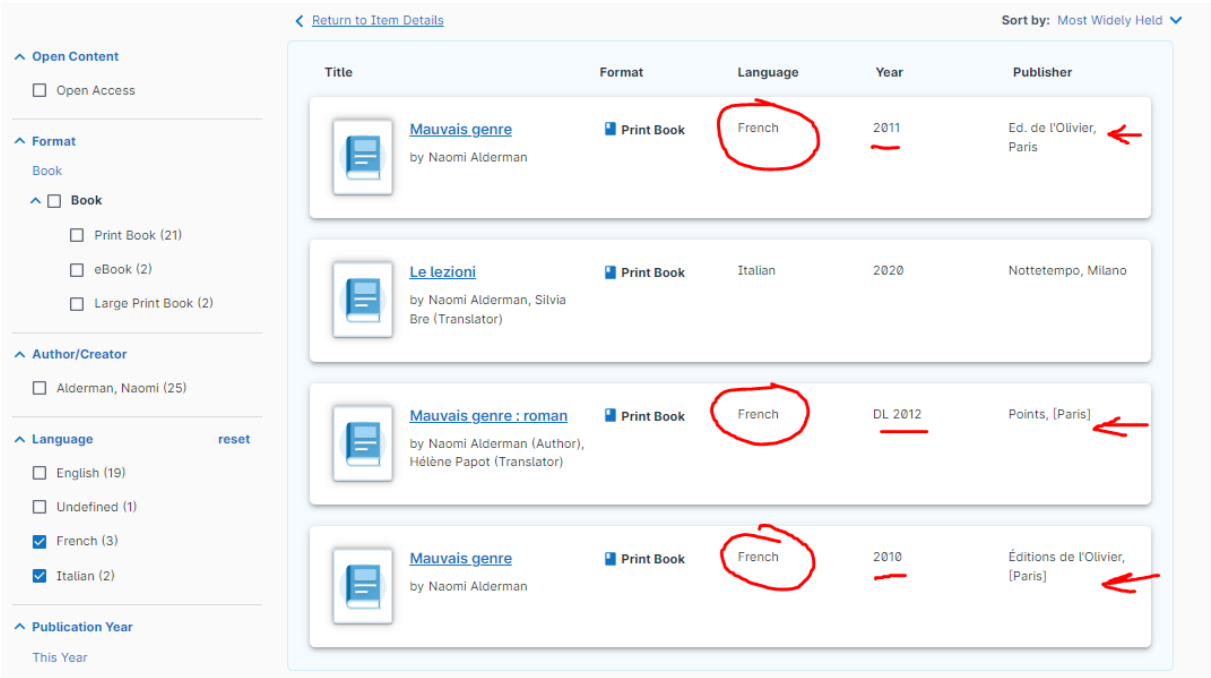


Figure 9. Multiple entries for *The Lessons*, which since 2010 has been issued by different publishers and translated into French and Italian (ISBN 9780670916290).

The metadata for each specific book is scattered across various MARC21 fields, making it challenging to explore the completeness of the metadata for all REF and LT books and report it in this article. However, future research could delve into this variety of metadata and its completeness. Technologies can help create a comprehensive picture for each book based on its metadata scattered across many related MARC21 fields. This could aid in the research assessment of books when evaluating the impact of the book and the research behind it.

Research by Ozaygen (2019) and by Neylon et al. (2018) demonstrates that open access books achieve significantly greater visibility and international reach. Unlike their counterparts confined to library shelves or researchers' drawers, open access publications break down barriers, fostering wider engagement and knowledge exchange across borders. Thus, when it comes to open access, the primary format is digital. As anticipated, WorldCat now includes a feature that shows open-access books. Some titles in eBook format display the "Access Free | Open" icon in the top right-hand corner. By clicking on this icon, registered users can access the Internet Archive and read the scanned book for free for one hour.

However, clicking the "DOI" field instead (under "Show more information") shows the eBook price on the publisher's website—hardly the open access that is expected in related recommendations and policies. One might interpret this feature as OCLC's experimental attempt to connect books with digital formats that will be truly open access and properly licensed.

The combination of book formats, editions, and translations, along with publication years, can provide valuable insights into the social impact of books. However, book evaluators can only glean these insights if they assess them over a period of time, not just after the book is published. It would be fascinating to conduct research that combines the extremely rich metadata on all these aspects already available in the MARC21 format.

6.5. The visibility of books in library catalogues

Answering the second research question involves examining the visibility in WorldCat of books submitted to national research assessments. I analyse REF and LT book metadata in specific MARC21 fields, focusing on book formats, library holdings, and metadata completeness. With the UK's REF mandating open access for books and Lithuania's emphasis on the status of publishers as examples of contrasting approaches to research evaluation, I seek to identify potential improvements to book visibility in libraries. Understanding the discoverability and accessibility of scholarly books is crucial for maximising their impact, regardless of policy variations.

6.5.1. Preserving knowledge: Insights from library holdings analysis

This subsection explores the "Library holdings" indicator in WorldCat, highlighting critical challenges in long-term scholarly knowledge preservation. Book discoverability, access to the entire book content, and preservation are intrinsically linked for the future of scholarly communication. Publisher mergers and disappearances, exemplified by the case of LAP LAMBERT Academic Publishing, emphasise the need for accessible digital copies through

libraries or the internet, underscoring the crucial role of digital archiving in ensuring knowledge remains available. While OmniScriptum (the parent publisher of LAP LAMBERT) claims UK and Moldova headquarters, ISBN prefixes point to Mauritius, and copyright pages list German publishers. Their limited print-on-demand model raises concerns about book accessibility. For instance, no library holdings exist for the 2012 book with ISBN 9783848445844 (Figure 10). More such books were found in both the REF and the LT sample.

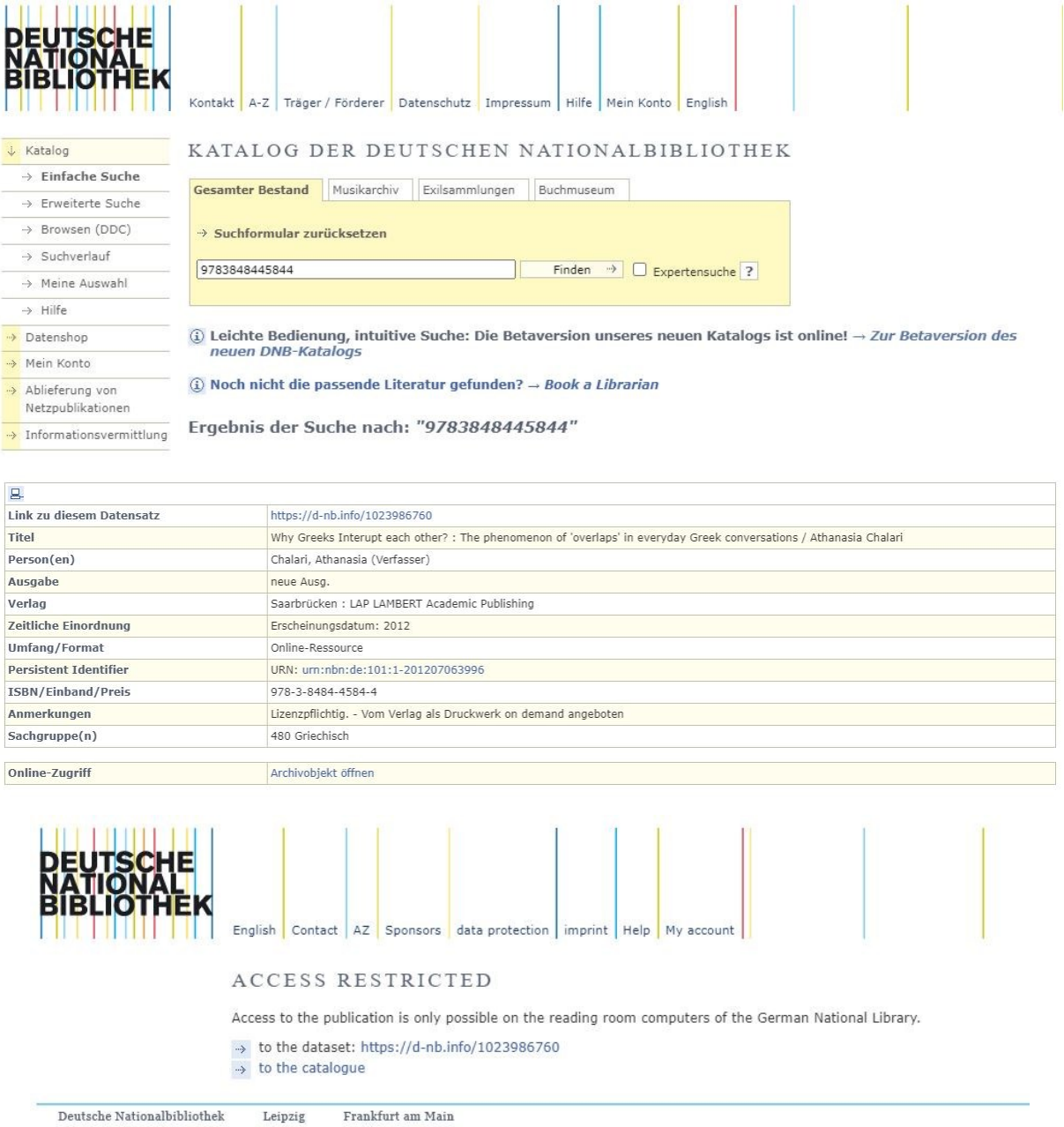
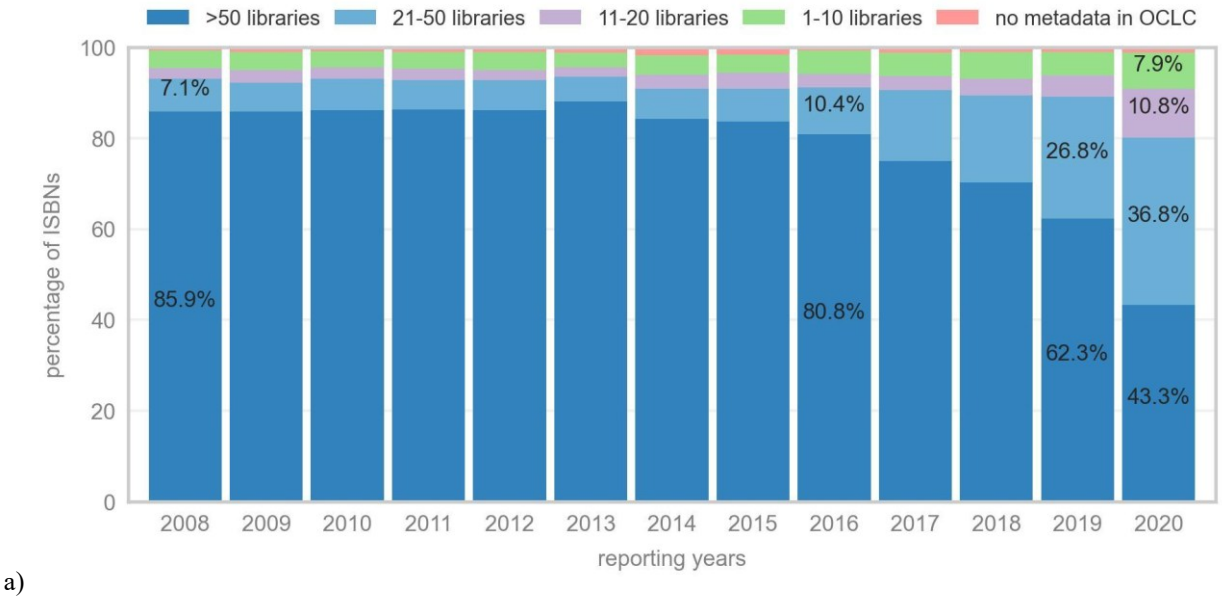


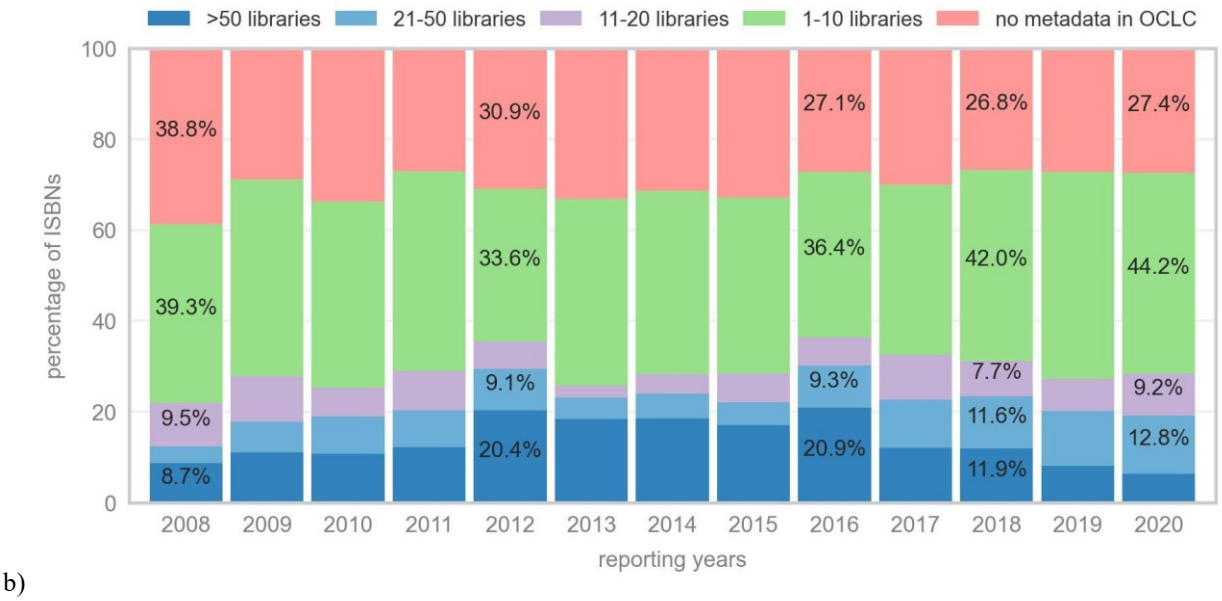
Figure 10. Record of a book issued by OmniScriptum is available at the national library (https://portal.dnb.de) with restricted access under legal deposit rules (ISBN 9783848445844).

Fortunately, legal deposit rules enable digital access in German national libraries' reading rooms, highlighting the potential of legal deposit for preservation (Figure 10b). By law, publishers or distributors in many countries must submit copies of their publications (usually

books) to a designated library or archive. Libraries designated by the government, often the national library, act as official depositories. The number of copies varies, with some countries requiring one and others multiple, depending on format or edition. Primarily, legal deposit aims to preserve national heritage and ensure comprehensive national bibliographic records. Other benefits include supporting scholarly research, enhancing library collections, and facilitating information access for all. Figure 11 illustrates the evolving distribution of UK and Lithuanian book holdings across libraries.



a)



b)

Figure 11. Library holdings and availability of UK (a) and Lithuanian (b) books in the OCLC databases.

While the proportion of UK books in over 50 libraries halved from 2008 to 2020 (Figure 11a), a significant number remain widely available. In contrast, Lithuanian books (Figure 11b) show limited international reach, with most holdings concentrated in fewer libraries. This underscores the need for broader distribution strategies to ensure wider accessibility.

Most concerningly, nearly a third of Lithuanian books are entirely absent from WorldCat, with the majority published in Lithuania itself. This raises concerns about discoverability and international access, highlighting the need for dedicated efforts to increase their visibility.

As this analysis shows, collaborative efforts are urgently required to address the challenges of long-term knowledge preservation. From supporting open access initiatives to strengthening legal deposit frameworks and promoting digital archiving best practices, collective action is crucial to ensuring the enduring availability of scholarly knowledge for future generations.

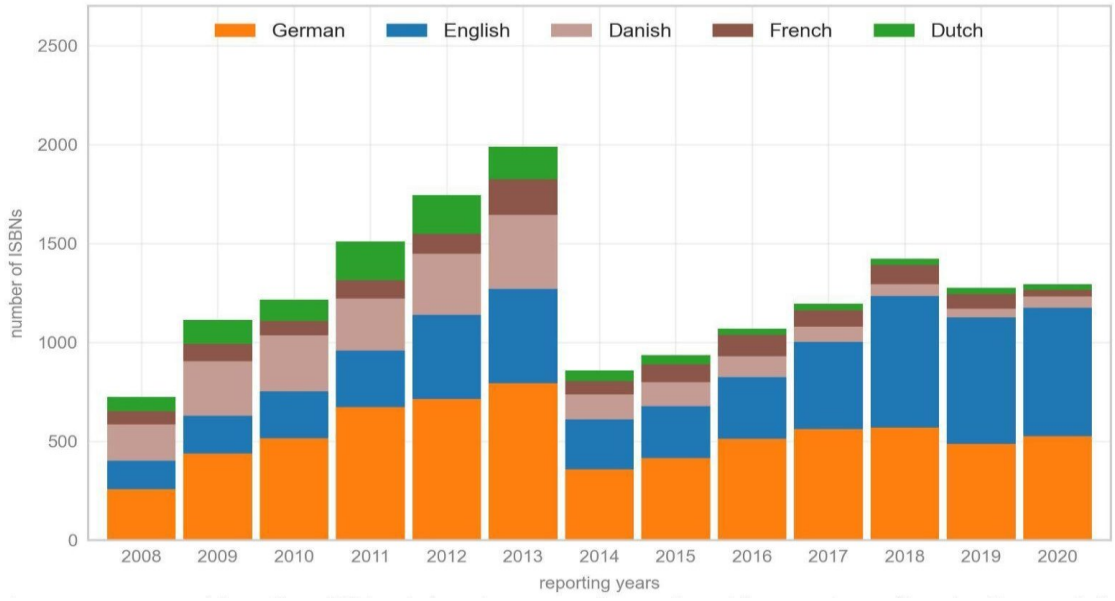
6.5.2. Providers of book metadata: Top contributors

The absence of many Lithuanian titles in OCLC databases prompted me to investigate the libraries contributing most to book visibility in WorldCat. Further analysis of the metadata helped to explain why half of Lithuanian-origin books are missing from the databases, while suggesting directions for further research into preservation strategies. The results revealed a rich multilingual landscape, with 26 languages used for cataloguing the REF books and 19 for the LT books. To identify the contributing institutions, I examined MARC21 field 040, which contained the source organisation and language used for the original record creation. This revealed 995 distinct MARC codes of organisations contributing to REF books' metadata and 311 for LT books.

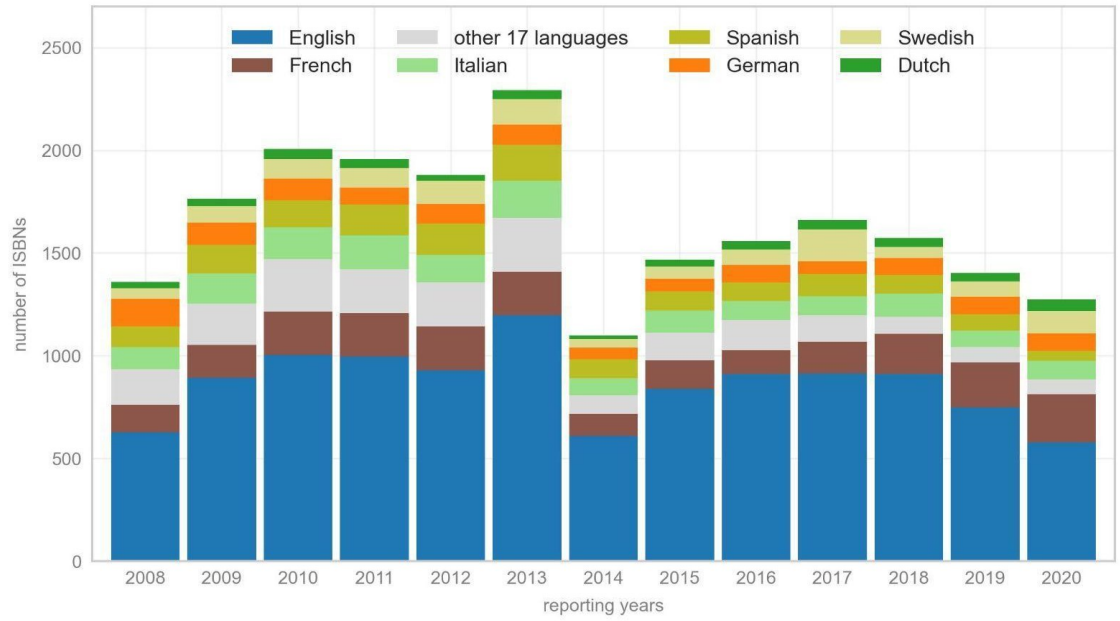
For REF books, the top 10 contributors (Figure 12a) accounted for just slightly fewer titles than the remaining 985 institutions (Figure 12b). Notably, since 2018, these top 10 contributors have catalogued approximately as many books as the rest. Further investigation revealed a geographically diverse group, with institutions from Germany, Denmark, the United States, Switzerland, France, and the Netherlands, but only one UK institution—the British Library Group Batchload. Interestingly, none of the top 10 were publishers, but rather resellers, libraries, and bibliographic data professionals.

For LT books, the top 10 contributors (Figure 13a) catalogued more books than the remaining 301 institutions (Figure 13b). Moreover, their output doubled between 2017 and 2020 (Figure 13a). This group comprises national and university libraries, commercial partners, and resellers from the United States, Germany, Poland, and the United Kingdom. Notably, no Lithuanian institution appears among the top 10 contributors. Furthermore, the absence of Lithuanian among the cataloguing languages suggests that the three Lithuanian academic libraries listed in the OCLC membership do not contribute book metadata.

These findings highlight the need for further investigation into the factors limiting Lithuanian book visibility in WorldCat. Future research could explore the reasons behind the lack of Lithuanian libraries among major contributors, potential barriers, and strategies for increasing the representation of Lithuanian titles in global bibliographic databases.



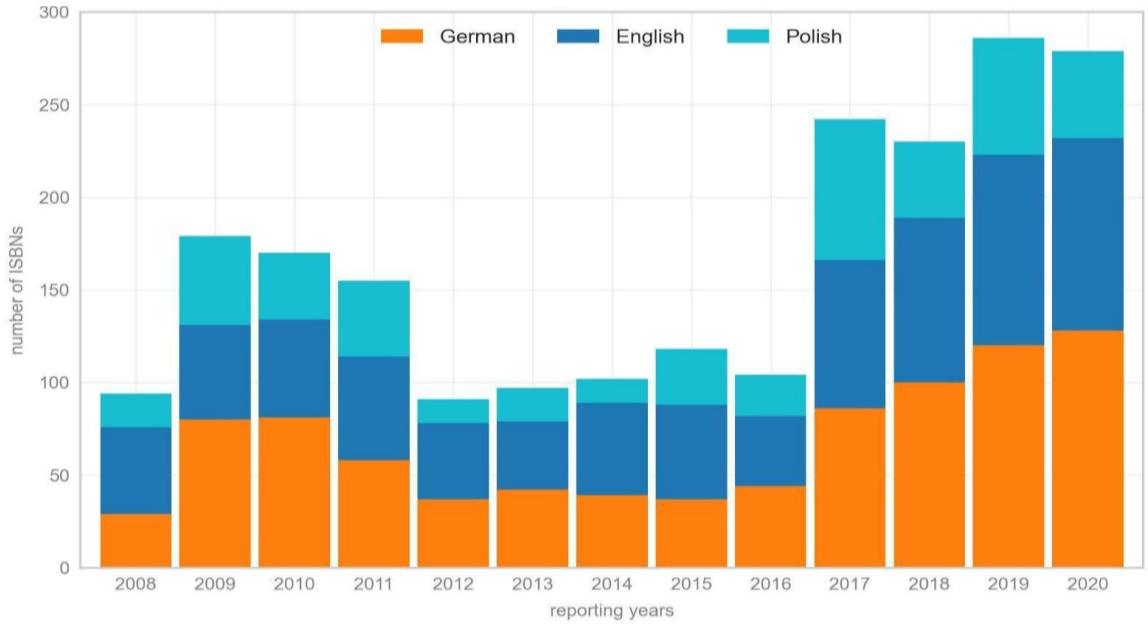
a)



b)

Figure 12a. Top 10 vs. other contributors to REF books' metadata availability in OCLC databases by language: (a) top 10 cataloguing agencies by number of books; (b) the remaining 985 agencies contributing to REF books' metadata availability in OCLC databases by language.
Each of the "other 17 languages" was used to catalogue <1000 books over this period.

a)



b)

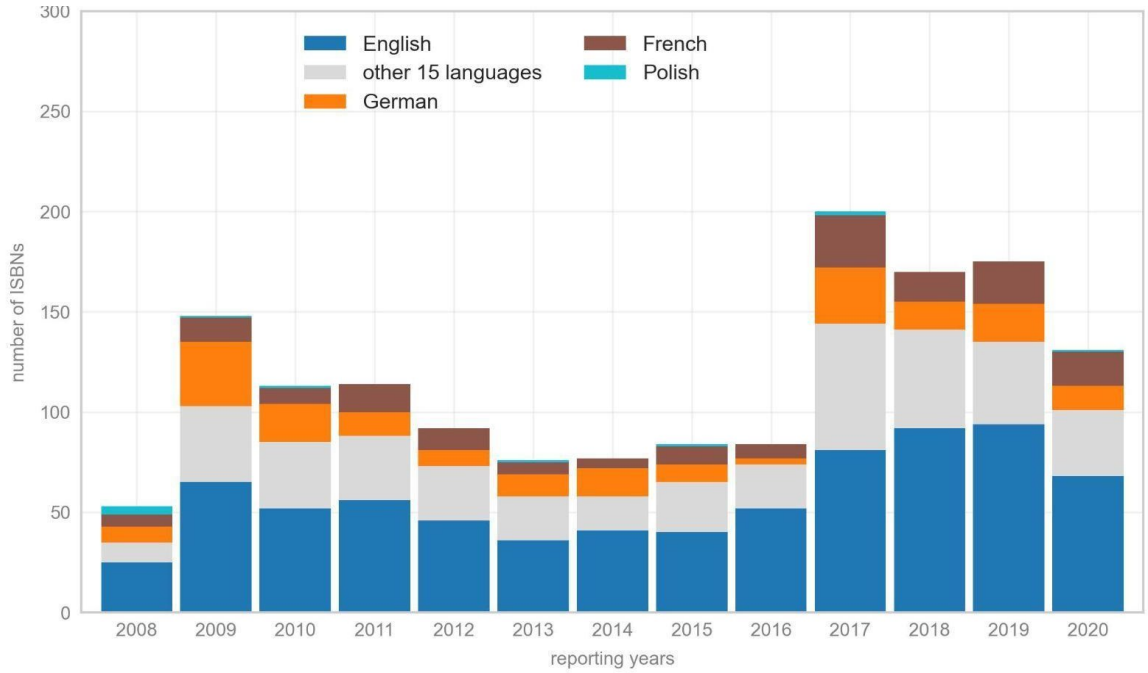


Figure 13. Top 10 vs. other contributors to LT books' metadata availability in OCLC databases by language: a) top 10 cataloguing agencies by number of books, b) the remaining 985 agencies. Each of the "other 15 languages" was used to catalogue <100 books over this period.

6.6. Discussion and conclusions

This research explored the suitability of book metadata available on the WorldCat catalogue and its MARC21 data fields for evaluating individual books, with particular attention to features relevant to scholarly book evaluation.

RQ 1: Which book metadata elements required for research assessment systems are present in WorldCat and are suitable for evaluating individual books?

As the results show, WorldCat and OCLC MARC21 XML records have nearly complete coverage of book metadata elements necessary for research assessment, such as *titles*, *languages*, and *publication years*. These book metadata elements are ideal for automated processing and bibliometric analysis.

While MARC21 XML data fields generally provide comprehensive contributor information (*authors*, *editors*, *translators*, etc.), approximately 10% of records require additional scrutiny and manual cleaning after automated processing.

Additionally, two book metadata elements, *genres* and *peer-review status*, are often absent in MARC21 but may be present in other systems depending on specific evaluation requirements. Some countries integrate and have this book metadata into national repositories or other systems designed for research assessments purposes (Sīle et al. 2017). For example, books in the Lithuanian Academic Electronic Library (eLABa) catalogue contain metadata fields on book genres as defined in national research assessment policies. In contrast, the UK's REF datasets identify only authored books and edited volumes because REF policies do not require peer review or any particular genre for 'long-form research' outputs (the term used for monographs and other scholarly books).

Although MARC21 *publisher* related fields contain non-standardized information and are not suited for automated processing, they can be used for qualitative analysis, particularly when combined with fields containing relevant notes. Instead of relying on MARC21 data fields, publisher names can be obtained from the Global Register of Publishers using book ISBN prefixes (Dagienė 2024b). Building on this, future research could assess how publisher names are presented in national lists (Pölönen et al. 2021) and their alignment with both OCLC data and the Global Register of Publishers, potentially informing the development of more standardized and reliable publisher information within research assessment systems.

Finally, the results highlight the richness of library resources in terms of formats, editions, and translations, but reveal that the open access feature in WorldCat is still experimental and does not directly indicate open access.

Overall, while WorldCat and MARC21 are valuable resources for book-level research assessment, their limitations regarding peer review, genre, and open access information should be considered in future research and development efforts.

RQ 2: What is the level of visibility in WorldCat of books submitted to national research assessments, and who are the primary metadata suppliers?

Book visibility in WorldCat depends on book acquisitions and metadata providers. This research found that German libraries significantly contribute to REF book visibility due to their position as top metadata providers. All REF books have MARC21 records, but completeness varies. Interestingly, no publishers were among the top 10 metadata suppliers, with resellers, libraries, and metadata professionals taking the lead.

Only two-thirds of LT books have MARC21 metadata and WorldCat visibility. No Lithuanian institutions currently supply MARC data to OCLC. As a result, German, American, and Polish data providers are primarily responsible for the visibility of Lithuanian books. Notably, German national libraries contribute data even for non-library-held books digitally preserved in their archives. Based on these findings, I recommend encouraging the Lithuanian National Library to become an OCLC member and contribute national book metadata as its German counterparts do.

Understanding contributors to book availability in OCLC can offer valuable insights for addressing visibility concerns around national research outputs.

Limitations, future research, and implications

This study acknowledges limitations in the completeness of its metadata analysis due to the complex nature of MARC21 fields containing forms of publications which were not requested for this project. Additional MARC21 metadata for book ISBNs are crucial if comprehensive analysis of publication forms is intended.

Even though the potential of MARC21 data is evident, as it can support compiling comprehensive metadata and creating rich metrics for individual books, further research is needed to explore the data ownership and technical constraints. Additionally, further research is needed to investigate long-term preservation and data availability in library catalogues.

Ultimately, collaboration among researchers, librarians, publishers, and metadata providers is crucial for developing and implementing effective standardised solutions for completeness of book metadata suitable for research assessment. By fostering such collaboration, we can build a more robust and informative publishing landscape, empowering researchers and evaluators to make informed decisions and transform book evaluation practices.

Chapter 7.
Conclusions

This concluding chapter consolidates the findings of this PhD thesis and draws out implications for research assessment policy and practice. It also offers actionable policy recommendations and suggests directions for future research.

7.1. Main findings

This PhD research addressed five research questions, each exploring a different dimension of quantitative research assessment in Lithuania.

RQ1: How have multi-actor dynamics within and outside the Lithuanian science system influenced the development and implementation of national research assessment policies?

Chapter 2 explored the dynamic interplay of actors and influences that shaped the adoption and evolution of quantitative research assessment in Lithuania. A key finding is the significant role of international research assessment experts, who advocated for the internationalisation of Lithuanian research by emphasising publication in recognised international journals, particularly those indexed in the Web of Science (WoS). This chapter also underscored some adverse effects of this reliance on external validation.

Lithuanian policymakers readily adopted this advice, believing that prioritising WoS publications would enhance the quality and impact of national research. However, this initial reliance on expert recommendations inadvertently led to an overemphasis on specific metrics and publication venues, highlighting the potential pitfalls of uncritically adopting external advice.

Furthermore, policymakers' efforts to incentivise international publishing through interventions such as the List of National Journals and the National List of Databases resulted in unintended consequences. The former led to a proliferation of institutional journals and lobbying efforts, while the latter faced challenges due to the inclusion of numerous domestic journals in commercial databases that did not meet quality expectations.

This reliance on external databases for quality control also proved problematic in other ways. The inclusion of many domestic institutional journals in WoS, driven by commercial interests, did not align with policymakers' initial goal of promoting publication in top international journals. This experience illustrates the unpredictability of delegating quality assessment to commercial entities and the potential misalignment between commercial interests and science policy goals.

The adoption of quantitative research assessment also sparked resistance from researchers in the social sciences and humanities (SSH). They argued that the stringent WoS publication requirements imposed by policymakers from the natural sciences disadvantaged their disciplines and failed to adequately reflect the quality of their research. This resistance culminated in a landmark Constitutional Court case, highlighting the agency of academics in shaping research assessment policy and advocating for a more inclusive and nuanced system.

Collectively, these findings demonstrate that research assessment policy is not a simple top-down process but a complex negotiation involving various actors with diverse interests and priorities. Policymakers in transitioning science systems must consider these multifaceted

interactions and potential unintended consequences, actively engaging with diverse stakeholders to create a more balanced and inclusive research evaluation environment.

RQ2: How have the strategies of policymakers, institutions, and researchers shaped the development of the Lithuanian Performance-Based Funding System?

Chapter 3 examined the evolution of the Lithuanian Performance-Based Funding System (PBFS) through a multi-level governance lens, considering the dynamic interplay of state, institutional, and individual actors. This research contributes to theoretical frameworks for policymaking within public science systems by analysing how these actors, with their diverse motivations and strategies, have shaped the PBFS and its outcomes.

While the Lithuanian PBFS aimed to improve research quality and accountability, this study reveals inherent tensions and unintended consequences within the national system. A key factor is the significant influence of authoritative academics who occupy powerful positions across all levels of governance—the Ministry, Research Council, and universities. This concentration of influence, while offering valuable expertise, has also led to unexpected outcomes.

One such outcome is the conflict between policymakers' drive for internationalisation, which initially prioritised publication in Western-controlled Web of Science (WoS) journals, and the capacity of Lithuanian universities to compete effectively in this global publishing arena. This pressure prompted universities to adopt alternative strategies, such as establishing and promoting their own institutional journals to secure state funding.

In some instances, influential academics (often journal editors) successfully lobbied for the inclusion of their institutional journals in WoS databases. This created an uneven playing field, as not all universities achieved this distinction, leading to disparities in access to public funding. Ironically, this outcome stemmed from policies initially championed by authoritative academics in policymaking roles, who ultimately became dissatisfied with these unintended consequences.

This dissatisfaction led to public critiques and the introduction of the journal suspension policy; a controversial measure aimed at curbing the influence of these newly prominent institutional journals. This policy highlights the complexities of quantitative research assessment and the unintended consequences of policy interventions, underscoring how the pursuit of specific metrics can shape institutional behaviour in unforeseen ways.

Moreover, the journal suspension policy exemplifies the tension between internationalisation goals and institutional funding imperatives. While intended to improve research quality and encourage publication in international journals, its unpredictable implementation and disproportionate impact on domestic journals generated unintended consequences. For instance, many Lithuanian researchers shifted towards potentially controversial publication venues, such as those offered by MDPI, raising concerns about whether national research quality genuinely improved.

Adding to these challenges, the limited power of state-level governance to influence institutional practices, due to university autonomy, further complicated the policymaking

landscape. Repeated legal challenges brought by academics against the government before the Constitutional Court led to the establishment of the principle of "legitimate expectations" in Lithuanian research policymaking. This principle, stemming from the court's recognition of the need for consistent and predictable policies, has fostered a risk-averse policy environment, hindering flexibility and innovation in research assessment policymaking.

In conclusion, the evolution of the Lithuanian PBFS demonstrates the challenges of managing competing interests and the unexpected outcomes of concentrated influence in research assessment within a multi-level governance structure. To foster a more balanced and effective system, Lithuania needs to encourage the active participation of diverse stakeholders, including independent researchers and lay citizens, in the policymaking process, drawing on evidence from independent research to inform policy development.

RQ3: How do European countries evaluate books submitted as research outputs, and how consistent are these evaluation practices across different countries?

Chapter 4 investigated book evaluation practices across various European countries, examining the diverse approaches employed to assess books submitted as research outputs for performance-based funding systems. This analysis reveals a diverse landscape characterised by both qualitative and quantitative approaches, each with its own set of challenges and limitations.

In the United Kingdom, policymakers have sought to address these challenges by introducing open access mandates for monographs and advocating for a shift away from considering publisher prestige in book evaluations. Conversely, countries employing quantitative systems grapple with the unintended consequences of metrics-based assessments, such as the inappropriate use of institutional-level metrics for individual researchers and the potential for gaming the system. The termination of the Danish Bibliometric Research Indicator at the end of 2021 exemplifies these concerns. Despite ongoing debates, a critical gap remains in understanding the implications of publisher rankings used for book assessment in certain countries.

Chapter 4 reveals that publisher rankings typically rely on criteria such as ISBN prefix, external peer review, a scientific publishing program, and the national or international scope of the publisher. However, these rankings often lack transparency regarding approval procedures and peer review practices. This opacity hinders a clear understanding of how publishers are selected and ranked, especially given that academics serving on expert panels usually make these decisions. This lack of transparency undermines the credibility of these assessments and raises concerns about the ability of academics to confidently navigate the book publishing landscape.

Moreover, Chapter 4 highlights inconsistencies in expert opinions on publisher prestige across different countries. A publisher considered prestigious in one country may be ranked lower or even deemed ineligible in another. This lack of consensus underscores the subjective nature of these rankings and raises questions about their reliability in assessing research quality.

Furthermore, the analysis reveals that both qualitative and quantitative approaches to research assessment often overlook the crucial role of dissemination in book evaluation. While publisher rankings focus on content quality, they rarely consider factors such as book metadata availability, digital book formats, and long-term preservation strategies, all of which contribute to the wider dissemination and impact of research published in books. This neglect of dissemination raises concerns about the comprehensive evaluation of research impact and the long-term accessibility of scholarly work.

RQ4. How can the ISBN Manual and the Global Register of Publishers (GRP) be utilised to identify the actual publishers of books and their roles in book production?

Chapter 5 demonstrates that the ISBN Manual and the Global Register of Publishers (GRP) are valuable resources for understanding the intricacies of book publishing and identifying the roles of various actors involved in the process. The ability to identify publishers and their roles is particularly relevant for research assessment systems, which must often evaluate books as research outputs.

The ISBN system, as detailed in the ISBN Manual, provides a standardised method for identifying publishers through the assignment of unique publisher prefixes incorporated into ISBN codes. These prefixes act as a key to unlock publisher information in the GRP database. Using the publisher prefix extracted from a book's ISBN, one can search the book publishers in the GRP database and reliably identify the specific publisher associated with that book. Such a process enables accurate attribution of publications, even in scenarios where numerous entities might be involved in a book's production and distribution.

Beyond simply identifying publishers, the ISBN Manual and the GRP help in understanding the roles of publishers in book production. The ISBN Manual outlines specific responsibilities of actors involved in publishing, including those of established publishers, authors and self-publishers, printers and printing services, and distributors of printed and digital copies, along with their rights and responsibilities. Identifying specific roles provides a framework for understanding the different actors and their contributions to the book publishing process. The metadata of ISBN codes accumulated in the GRP database complements this information by providing further details about each publisher, such as their names, country of operation, website URL and contact information. Analysing the GRP data allows for the categorisation of publishers into different types, such as university presses, university departments, professional academic publishers, or various other organisations. This categorisation helps to elucidate the primary functions of the book publishers and how they contribute to the production and dissemination of scholarly works.

The GRP also allows for the identification of "parent" publishers and their subsidiaries by analysing publisher prefixes and their interrelationships. This helps unravel the web of publishing structures and understand the connections between different publishing entities. In cases where the GRP metadata alone does not provide a complete picture, additional resources such as library catalogues and online searches can be used to uncover further details about publisher involvement. Book-related metadata, increasingly available from sources beyond library catalogues, provides a more comprehensive view of the book publishing landscape,

including discoverability, long-term preservation, and other aspects. This additional information, compiled from diverse sources, can benefit academics involved in research assessment by offering a more accurate and nuanced understanding of the research outputs' value.

The ability to accurately identify publishers and understand their roles is crucial for developing informed and effective research assessment practices. By utilising the ISBN Manual and the GRP, research assessment systems can move beyond simplistic evaluations based solely on publisher reputation. Instead, they can consider publishers' specific contributions to the quality and dissemination of research outputs. This nuanced approach promotes fairer and more effective research assessment practices.

RQ5. To what extent does WorldCat metadata reflect the effectiveness of Lithuanian research assessment policies in enhancing the visibility of nationally authored books?

Chapter 6 examined the role of WorldCat metadata in quantifying Lithuanian policymakers' success in gaining a wider platform for nationally authored books. The analysis reveals that while WorldCat offers a valuable platform for showcasing research outputs, its metadata practices present both opportunities and challenges for accurately representing the impact of these policies.

WorldCat metadata provides a valuable, albeit incomplete, reflection of the effectiveness of Lithuanian research assessment policies in enhancing the visibility of nationally authored books. A key finding is that WorldCat and OCLC databases contain metadata for only two-thirds of Lithuanian book outputs, rendering a significant portion invisible to the global academic community.

While WorldCat boasts near-complete coverage of essential metadata elements such as titles, languages, and publication years—crucial for automated processing and bibliometric analysis—it falls short in capturing information specifically relevant to Lithuanian research assessment policies. Notably, two key elements, book genre and peer review status, are often absent. This omission hinders the accurate representation of Lithuanian research outputs, as these elements are specifically defined and prioritised within national assessment frameworks.

This discrepancy is exemplified by contrasting the Lithuanian Academic Electronic Library (eLABa) catalogue, which includes dedicated metadata fields for book genres aligned with national policies, with WorldCat's lack of such standardised genre classification. This suggests that WorldCat's metadata model may not fully align with the specific requirements of the Lithuanian research assessment system, potentially limiting its ability to accurately reflect the impact of these policies on book visibility.

Furthermore, Chapter 6 reveals a significant gap in the visibility of Lithuanian books within WorldCat. Only two-thirds of Lithuanian books have MARC21 metadata and are discoverable in WorldCat, primarily due to the absence of Lithuanian institutions contributing metadata to OCLC. Reliance on foreign institutions, particularly German, American, and Polish data providers, for the visibility of Lithuanian research outputs constitutes a critical dependence on external actors.

This situation contrasts sharply with the UK experience, where all books submitted for the Research Excellence Framework (REF) have MARC21 records and are visible in WorldCat, largely due to the significant contributions of national libraries outside the UK as major metadata providers. This disparity underscores the need for greater involvement of Lithuanian institutions, particularly the National Library, in contributing metadata to WorldCat to enhance the visibility of national research outputs.

In conclusion, while WorldCat's limitations regarding peer review, genre, and open access information present challenges for accurately reflecting the effectiveness of Lithuanian research assessment policies, its potential for enhancing book visibility is undeniable. By addressing these limitations and encouraging active participation from Lithuanian libraries or other institutions in metadata provision, WorldCat can become a more powerful tool for showcasing and promoting Lithuanian research on a global scale. This highlights the need for closer collaboration between Lithuanian research institutions and OCLC to ensure the comprehensive representation and discoverability of Lithuanian scholarship.

7.2. Fulfilment of research objectives

By addressing the research questions discussed above, this PhD thesis focused on three core objectives. First, it aimed to understand the evolving landscape of research assessment in science systems transitioning from the Soviet era to the international landscape, as has been the case in Lithuania. Second, it aimed to contribute to the development of more effective and responsible research assessment frameworks, specifically for "low R&I performing" (or "widening") countries navigating the challenges of research internationalisation (European Commission 2024). Third, it aimed to contribute to the development of policymaking theories and understanding of policy dynamics within public science systems, with implications for underperforming countries seeking to improve their international standing.

This PhD research addressed its first objective by analysing the evolving research assessment landscape in transitioning science systems, with a focus on Lithuania. It highlighted the complex interactions among policymakers, higher education institutions (universities), and scientific elites, who act as both independent and collective actors representing their institutions and intermediary organisations (such as the Research Council). These collective actors, with their distinct voice and mediating role between the state and the science community, have significantly shaped the public science system and, in particular, the research assessment system. This PhD thesis uncovered unintended consequences arising from the adoption of quantitative assessment methods at university and individual levels, especially those that overemphasised high-impact journals indexed in Web of Science databases. This overemphasis, coupled with strong financial incentives, led to an unforeseen surge in institutional journals subsequently indexed in those desired databases. Furthermore, it led to strategic adaptations of publishing behaviours, resulting in the dominance of national papers in MDPI journals. Additionally, the initial unsuitability of mandatory assessment criteria for social sciences and humanities (SSH) triggered Constitutional Court cases, creating a risk-averse policy environment and slowing down internationalisation of the SSH disciplines. Ultimately, this research demonstrates the multiple dynamics at play when transitioning

science systems such as Lithuania's employ quantitative research assessment in pursuit of rapid global integration and quick tangible results. The influence of scientific elites seeking to defend their interests has substantially shaped the research assessment system and the public science system in general. The challenges and unintended consequences identified in this PhD research emphasise the importance of developing context-sensitive and responsible research assessment frameworks that support, rather than hinder, the internationalisation efforts of smaller science systems.

This PhD thesis also contributes to the development of responsible research assessment frameworks by exploring various lists of national journals, international databases, suspended journals, and prestigious book publishers, revealing their emergence, closure, and outcomes. Notably, this research pioneered the exploration, for research assessment purposes, of the Global Register of Publishers, a first-hand source of reliable primary data maintained by the International ISBN Agency. This database was used to test whether policymakers achieved their goal of publishing with internationally recognised publishers to gain better visibility for national books. The research found inconsistencies in the awarding of prestigious rank to book publishers and revealed that universities and academics themselves published half of the books submitted as national research outputs. This finding was further corroborated by examining book metadata in WorldCat, which demonstrated the limited international visibility of books authored by Lithuanian researchers. Furthermore, this PhD research shows that national libraries and other book metadata providers, rather than book publishers, contributed to the availability of national book metadata in WorldCat and its long-term preservation. The introduction of the Global Register of Publishers as a valuable data source for scientometric research directly supports the development of responsible and effective assessment practices. This is because the Register offers unrestricted access to primary data for any registered ISBN worldwide, enabling more accurate and comprehensive analyses of publication patterns. By providing reliable information on publishers, including their location, size, and output, the Register helps to contextualise research outputs and avoid biases inherent in relying solely on established proprietary databases or journal lists. This, in turn, allows for more nuanced and equitable assessments that consider the diverse publishing landscapes of different research communities. By alerting developers of responsible research assessment frameworks to the multiple issues and constitutive effects of various lists of journals, databases, and book publishers, this PhD research contributes to the development of more effective and responsible research assessment practices.

Finally, this PhD research contributes to the theoretical understanding of policymaking dynamics within transitioning science systems. Drawing on theoretical frameworks such as the Advocacy Coalition Framework, the Multiple Streams Framework, and the Multi-level, Multi-actor, and Multi-issue Framework, this thesis empirically analysed the policy dynamics among policymakers, scientific elites, and research institutions. One of the main contributions lies in its empirical examination of the role of scientific elites in shaping research assessment policies within a relatively small academic community. The study revealed how scientific elites, often holding influential positions in both academia and government, exerted significant influence on the development and implementation of research assessment approaches and

policy instruments that policymakers applied to overcome unintended consequences. As this PhD research revealed, scientific elites mobilised institutional resources, built professional coalitions, leveraged their expertise, and even stepped into political roles to influence the development of research assessment and the national science system. Uniquely, this PhD thesis provides empirical evidence for the applicability of theoretical frameworks with multi-actor implementation in analysing the intertwined dynamics within science policymaking in small, transitional, and/or underperforming countries. By examining the interactions among different levels of governance, diverse actors, and multiple policy issues, this PhD research sheds light on the factors that shape research assessment policies, informing the development of theoretical frameworks for policymaking in public science systems, especially in "low R&I performing" or transitioning countries.

In conclusion, this PhD dissertation has fulfilled its research objectives by providing a comprehensive analysis of the Lithuanian research assessment system and its implications for transitioning science systems of "low R&I performing" ("widening") countries. The findings offer insights for policymakers, research institutions, and researchers, particularly in smaller countries, who are navigating the challenges of internationalisation. By highlighting the complexities and unintended consequences of quantitative assessment approaches, this research contributes to the ongoing dialogue on responsible research evaluation and the pursuit of more nuanced and equitable assessment frameworks.

7.3. Policy recommendations

The following recommendations, based on the findings of this thesis, represent potential improvements to the Lithuanian policymaking landscape and book evaluation practices.

7.3.1. Science policymaking

Reduce reliance on external expertise. As demonstrated in Chapters 1 and 2, science policymakers have often relied on reports from foreign organisations and domestically produced or commissioned studies to shape the Lithuanian research assessment system—a strategy that ultimately proved ineffective and even led to Constitutional Court cases. This over-reliance on commissioned studies has resulted in a critical gap—the absence of independent research within Lithuania to systematically study the national science system. When developing science policies and aligning them with international trends, policymakers should prioritise internal expertise, encouraging independent research and focusing on national research priorities. This approach fosters local research capacity, promotes national priorities, and ensures policy relevance. While international collaboration and benchmarking remain valuable, the government should:

- Promote critical reflection on external recommendations, considering their alignment with the national context and potential disciplinary biases or even geopolitical considerations.
- Establish clear guidelines for incorporating external expertise, ensuring it informs, but does not dictate, national strategies.

Strengthen independent expertise on the Lithuanian research system. To foster self-sustaining, locally driven research evidence for policymaking and avoid legal challenges from academia, the government should establish an independent, multidisciplinary research unit within a university setting, ensuring its autonomy from direct government influence. This unit should foster collaboration among researchers from various Lithuanian universities and diverse disciplines, including (but not limited to) sociology, anthropology, philosophy, and history, to conduct research on the Lithuanian research system. To compensate for the current lack of local expertise in fields such as scientometrics, research policy, science policy literature, and economics of innovation, the unit should actively invite leading international scholars in these areas to collaborate with Lithuanian researchers. This approach leverages the diverse expertise within Lithuania and the broader international community, creating a centralised hub for generating independent knowledge about the national research landscape.

This dedicated unit should also perform three main tasks:

- Engage in comparative studies of research assessment policies and practices in Lithuania and other countries.
- Participate actively in international research assessment forums and help develop global best practices.
- Disseminate its research findings to inform policy development and foster a culture of research integrity and responsible evaluation practices in Lithuania.

To achieve these goals, the government should:

- Provide funding for the establishment and operation of the research unit. This could include support for staffing, research projects, infrastructure, and dissemination activities.
- Facilitate collaboration between the unit and relevant stakeholders. This could involve encouraging partnerships with other universities, research institutions, and government agencies.
- Support the development of national research databases and evaluation frameworks that reflect the diversity of Lithuanian research and encourage collaboration within the country. These databases should provide open access to relevant research information, enabling science policy decisions to be made based on transparent evidence and inclusive data.

Mitigate risk aversion in policymaking. To avoid legal challenges, government institutions should promote a more flexible and innovative policy environment. To achieve this, the government should:

- Empower the above-mentioned research unit to pilot projects that develop quantitative and qualitative approaches that allow the proper understanding of the Lithuanian science system and its context, allowing for more contextualised research assessment systems. The unit should communicate its findings to academia and broader audiences. By organising these pilots, the research unit will generate independent evidence to inform policy development and complement recommendations by international

experts. This combined evidence base will ensure the Lithuanian research assessment system remains innovative and responsive to local and international needs.

- Foster inclusive policymaking by engaging diverse stakeholders in open dialogue when developing research assessment policies. These stakeholders include not only state agencies, research organisations, and individual researchers inside academia but also stakeholders outside academia and civil society representatives interested in national science development. This inclusive approach will ensure diverse perspectives are considered, enrich discussions, and increase transparency in lobbying activities.
- Create transparent and inclusive processes for developing and revising research assessment policies. Such a process builds trust among academics and other stakeholders and reduces the likelihood of legal challenges.

Implementing the above actions will help Lithuania create a more independent, robust, and internationally recognised research system that effectively supports the country's long-term development goals.

7.3.2. Book evaluation and global visibility for Lithuanian research

This PhD research further demonstrates that incentivising publication with prestigious publishers has not effectively promoted the internationalisation of Lithuanian research. Local universities or self-publishing services publish most academic books, limiting their international visibility and reach. Even when books are published by international publishers, their "prestige" is questionable, and book metadata is often unavailable in international library databases. This hinders discoverability and undermines the effectiveness of current policies in promoting Lithuanian research internationally. Furthermore, the inconsistent and opaque practices that determine "prestigious publisher" rank raises concerns about their reliability and fairness in assessing research quality.

Therefore, to avoid the biases and inconsistencies inherent in prestige-based rankings, Lithuania should abandon its current book evaluation system that relies on publisher prestige as the primary criterion for research quality, instead prioritising open access, discoverability, and long-term preservation as the minimum foundational criteria for book evaluation. By focusing on these core aspects, the evaluation system can ensure wider dissemination, easier access, and the lasting availability of research presented in scholarly books. This initial focus provides a strong foundation for a more comprehensive and equitable book evaluation framework. This framework should be developed in close consultation with the Lithuanian academic community, ensuring it remains dynamic and responsive to the evolving landscape of scholarly communication, as described in the Vision for Scholarly Communication in the 21st Century (Kraker et al., 2016). Future research should investigate the long-term impacts of these reforms on research practices in Lithuania and the international dissemination of knowledge generated by Lithuanian scholars.

The following actions are recommended to enhance the global visibility of Lithuanian research presented in scholarly books:

Prioritise open access. Research assessment policies must ensure that scholarly books submitted for state funding are freely available and accessible to a global audience.

Enhance discoverability. Lithuanian research institutions should improve the discoverability of their scholarly books by supporting comprehensive metadata creation and encouraging the use of diverse digital formats compatible with current accessibility requirements. This includes:

- Publishing in institutional repositories.
- Promoting the inclusion of Lithuanian research in international library catalogues and databases.
- Preparing digital formats suitable for automated translation technologies, especially for books written in Lithuanian.

Support long-term preservation. Research institutions, with support from the government and in collaboration with national and academic libraries, should incorporate long-term preservation strategies to ensure the enduring availability and accessibility of Lithuanian scholarly books.

To enhance the internationalisation of Lithuanian research, the government should actively promote and support the recommendations outlined above. This will ensure that Lithuanian scholarly books are discoverable and accessible to a global audience, fostering greater international collaboration and recognition.

7.4. Directions for future research

7.4.1. Science policymaking

To further support the policy recommendations outlined in Section 7.3.1, future research could:

Investigate the origins and impact of the "lagging behind" narrative in Lithuanian science policy. Future research could investigate how this negative narrative emerged, how it influences policy decisions, and whether it is unique to Lithuania or a common theme in other countries' science policy. A comparative analysis of policy recommendations issued by international organisations for different countries might reveal valuable insights.

Identify and evaluate alternative models for incorporating external expertise. Future studies could also explore how other countries effectively utilise external expertise to support self-sustaining and locally driven research systems, while avoiding the pitfalls identified in this study. The dedicated research unit proposed in Section 7.3.1 could play a key role in this investigation by analysing international best practices and identifying models suitable for the Lithuanian context.

Analyse the impact of national policies on local research communities. Finally, future research could explore how national policies, especially those shaped by external experts, have influenced institutional and individual behaviour within Lithuanian academia, paying close attention to potential disciplinary differences. A mixed-methods approach, combining bibliometric analysis with qualitative data from interviews and surveys, could provide a deep understanding of the impact of these policies on research output, collaboration, and researcher experiences. For example, future research could analyse variations in impact across disciplines and delve into the reasons behind these variations. It could also investigate why internationalisation, as measured by collaborative papers, did not develop as expected even though the number of domestically published articles significantly decreased. Future research could also examine the reasons behind the emergence of certain publishing patterns, such as the dominance of articles in MDPI journals.

7.4.2. Book evaluation

To further support the policy recommendations outlined in Section 7.3.2, future research could:

Investigate both pre- and post-publication peer review practices for scholarly books. Future research should examine the origins and practical implications of the peer review practices surrounding scholarly book publication, as well as these practices' contributions to transparency and quality assurance in book evaluations. How do different peer review models (e.g., non-anonymous vs. anonymous reviews) influence these aspects? A comparative case study could analyse how non-anonymous pre-publication peer review, common in Eastern European countries, was formalised and implemented, contrasting it with practices in Western countries and exploring the associated challenges and controversies. For example, this research might delve into the unintended consequences of policy decisions, such as mandating Western-style post-publication book reviews for "research quality" in Lithuania. Did this policy, intended to signal research significance, inadvertently incentivise the publication of a large volume of often superficial reviews, creating an unnecessary burden on the scholarly publishing system? Finally, it is essential to consider the specific challenges of evaluating books in multilingual contexts such as Lithuania, where peer review practices and expectations may vary significantly across different language communities.

Develop a comprehensive framework for book evaluation that moves beyond publisher prestige and embraces open science principles. Future research could explore how to move beyond reliance on publisher prestige by developing a comprehensive framework grounded in the Vienna Principles for the future of scholarly communication, along with other relevant open science declarations and recommendations. It might investigate how to incorporate factors such as discoverability, availability in diverse digital formats, and long-term preservation strategies into the research assessment process, recognising the contribution of these features to the dissemination and impact of scholarly work. This research could also involve surveying and interviewing academics involved in policymaking and publisher rankings to gauge their perspectives on newly proposed evaluation criteria.

Investigate a wider range of book metadata sources. Future research could go beyond traditional library catalogues such as WorldCat and explore the potential of platforms and services such as Google Books, Open Library, Wikipedia, Directory of Open Access Books (DOAB), Crossref, and others to provide richer and more nuanced information about books. This investigation should include an examination of national library repositories, which preserve legal deposit copies and serve as primary data providers to WorldCat. Utilising the same dataset of ISBNs used for testing WorldCat data would ensure comparability across different sources. This research could:

- Evaluate the quality and completeness of metadata provided by different sources.
- Identify strategies for improving data accuracy and consistency.
- Explore the extent to which books are already published as open access, providing insights into the availability and accessibility of scholarly works.
- Contribute to a deeper understanding of the evolving book publishing landscape.
- Enhance research assessment criteria and support more effective research evaluation.

The research directions outlined above offer avenues for advancing the understanding of science policymaking and book publishing landscapes, promoting positive change in research assessment and scholarly communication. These directions provide a roadmap for future research that can further support the implementation and refinement of the policy recommendations outlined in Section 7.3.

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Summary

Quantitative Research Assessment and its Unintended Consequences

This PhD dissertation offers a comprehensive analysis of the dynamics of quantitative research assessment in Lithuania, a small nation integrating into the global research landscape after regaining its independence. This research investigates the historical evolution, policy implications, and behavioural impact of quantitative research assessment practices on individual researchers, institutions, and broader research outcomes. By focusing on Lithuania, the thesis provides in-depth insights relevant to numerous countries grappling with similar challenges in a globalised world, contributing to ongoing debates on responsible research evaluation.

Chapter 1 establishes the foundational context for the dissertation by analysing Lithuania's journey with quantitative research assessment. Lithuania's experience serves as an insightful case study for other countries seeking to foster responsible and effective research evaluation practices. The chapter examines external evaluations that consistently depicted Lithuania as "lagging behind" in research and innovation, a narrative that fuelled extensive reform efforts. European Union reports highlighted persistent issues such as funding deficits, low research output, and weak international collaboration; in response, Lithuanian state bodies, notably the Research and Higher Education Monitoring and Analysis Centre, were established to guide reforms despite internal policy tensions. The chapter notes a scarcity of independent analyses of Lithuania's research assessment system in existing academic literature. It details the system's structure, built upon regulations for academic degrees, minimum qualification requirements, and the Performance-Based Funding System (PBFS). These components heavily incentivise publications in high-impact international journals. The chapter concludes by outlining the dissertation's core research objectives, its mixed-methods approach, and five key research questions concerning multi-actor policy dynamics, the PBFS's evolution, comparative book evaluation, identifying actual book publishers, and the visibility of Lithuanian research.

Chapter 2 investigates the multi-actor policy dynamics that shaped the development of quantitative research evaluation in Lithuania between 1996 and 2008. As Lithuania aimed for internationalisation, it adopted author- and journal-based metrics for funding and promotion. This reform involved complex interactions between international experts, national policymakers, publication data providers, and academics navigating between Soviet traditions and international trends. Three key multi-actor dynamics are identified: the "expert dynamic", illustrating how Lithuanian policymakers engaged with foreign experts emphasising international publications; the "database dynamic", examining interactions among policymakers, data providers (e.g., Web of Science), and journal publishers, revealing unintended consequences; and the "academic dynamic", exploring how researchers, particularly in social sciences and humanities, resisted imposed quantitative measures, leading to disciplinary tensions and a landmark Constitutional Court case. Using a mixed-methods approach, the findings highlight the challenges of adopting international practices in a small,

transitioning system, the influence of data providers and academic lobbying, and the importance of considering disciplinary differences. The Lithuanian case offers valuable lessons for research assessment reforms, emphasising nuanced approaches and continuous dialogue.

Chapter 3 delves into the intricacies of the Lithuanian PBFS from its inception in 2005 to 2022, using a multi-level, multi-actor, and multi-issue framework. It analyses the roles of key actors—the Ministry of Education, Science, and Sport; the Research Council of Lithuania; universities; and scientific elites—and their interactions. The Ministry faced challenges in stakeholder engagement, while the Council encountered complexities in ensuring expert independence. Universities strategically responded to PBFS incentives by establishing institutional journals and pursuing international collaborations. These changes underscored the dominant influence of scientific elites, who hold leadership positions across governmental and institutional levels, leading to systemic tensions. The chapter explores how policymakers navigated the disparity between international aspirations and domestic realities, initially focusing on international publications but later grappling with unintended consequences such as the proliferation of domestic WoS-indexed journals. The controversial "suspended journals" policy is analysed for its inconsistencies, and evolving individual and institutional strategies in response to the PBFS are discussed through case studies. The chapter concludes by emphasising the dominant role of scientific elites in shaping the PBFS and the need for broader stakeholder involvement for a more balanced and effective system.

Chapter 4 investigates methods for identifying prestigious publishers in academic book assessment, comparing Lithuanian practices with those of other countries and examining the consistency and verifiability of these assessments. It highlights the increasing importance of publisher prestige in metric-based funding systems, as contrasted with qualitative peer-review approaches. A mixed-methods approach, including qualitative document analysis and a bibliometric investigation of Lithuanian book outputs (2004–2016), reveals significant inconsistencies in how Lithuanian experts classify publishers as prestigious over time. Comparison with publisher rankings in Norway, Denmark, Finland, and Poland shows a lack of international consensus. The chapter also examines formal definitions of publisher prestige, which often prove less than transparent; an analysis of several international publishers further reveals difficulties in verifying compliance with stated requirements. The findings suggest that assessment of books based on publisher prestige is subjective and inconsistent, both within Lithuania and internationally. The discussion concludes that "prestigious publisher" is often ill-defined, which undermines the validity of publisher rankings as a primary indicator of book quality. The chapter calls for future research to focus on broader aspects of book publishing, such as quality control, dissemination, and transparency.

Chapter 5 explores the potential of the ISBN Manual and the Global Register of Publishers (GRP) for understanding book publishing practices, particularly within research assessment in Lithuania and the United Kingdom's Research Excellence Framework (REF) from 2008 to 2020. It contrasts Lithuania's focus on publisher prestige with the UK's emphasis on content and the growing importance of open access. A mixed-methods approach reveals that while the ISBN Manual and GRP are valuable for identifying ISBN registrants, determining book genre

solely from this metadata is challenging. The complexities of identifying the actual book publisher are highlighted due to the ISBN system's flexibility and the challenges posed by imprints, mergers, and acquisitions. The bibliometric analysis of UK and Lithuanian book ISBNs using GRP metadata provides insights into researchers' publishing practices, revealing differences in publishing power concentration and favoured publisher types. The GRP proves a useful resource for bibliometric analysis of book publishing, which in turn further illustrates the drawbacks of relying solely on publisher reputation in research assessment. Instead, a nuanced approach is needed: one that one that considers actual publishing practices and aligns with scholarly communication principles such as open access. These findings underscore the potential of ISBN and GRP data for informing policy.

Chapter 6 advocates for a shift towards individual book assessment, in keeping with open science principles, and critiques the current emphasis on publisher prestige. It highlights the need for comprehensive book metrics capturing a book's full lifecycle; to this end, the chapter investigates WorldCat metadata availability and the visibility of books submitted to national research assessments in the UK's REF and Lithuanian research assessments (2008–2020). A mixed-methods approach reveals that WorldCat offers nearly complete primary metadata (titles, languages, publication years), though contributor information requires cleaning, and crucial elements such as genre and peer-review status are often missing. While publisher information in the MARC21 format for bibliographic data is non-standardised, the GRP can provide more reliable data. Regarding visibility, German libraries are significant contributors to REF book discoverability in WorldCat. In contrast, only two-thirds of Lithuanian books are present in the WorldCat catalogue, which relies primarily on German, American, and Polish data providers due to a lack of Lithuanian institutional contributions. The chapter concludes that while WorldCat is a valuable resource for book-level research assessment, its limitations in terms of genre, peer review, and consistent open access information need addressing. It emphasises the importance of collaboration among stakeholders to improve metadata completeness and accessibility, fostering fairer evaluation practices beyond publisher prestige.

Chapter 7 consolidates key findings, discusses the fulfilment of research objectives, and proposes policy recommendations for Lithuania's science policymaking and book evaluation along with future research avenues. The research revealed international experts' significant influence on Lithuania's adoption of quantitative research assessment and the unintended consequences of prioritising Web of Science publications. It highlighted how the complex PBFS dynamics, shaped by policymakers, institutions, and influential academics, led to issues such as institutional journal proliferation and the controversial journal suspension policy. The thesis demonstrated inconsistencies in book evaluation practices across Europe, most notably the subjective nature of publisher prestige. Furthermore, it established the ISBN Manual and GRP as valuable tools for identifying actual book publishers and their roles, beyond mere reputation. Finally, while WorldCat offers potential for enhancing Lithuanian book visibility, its metadata is incomplete and underutilises local contributions. This PhD research fulfilled its objectives by analysing the evolution of research assessment in a transitioning science system, contributing to more effective and responsible assessment frameworks for smaller

countries, and enhancing theoretical understanding of policymaking dynamics within public science systems.

Policy recommendations include reducing reliance on external expertise, strengthening independent research on the Lithuanian science system, mitigating risk aversion in policymaking, abandoning prestige-based book evaluation in favour of open access and discoverability, and enhancing Lithuanian research's global visibility through improved metadata and preservation strategies. Future research directions include investigating the "lagging behind" narrative's origins and impact, evaluating alternative models for incorporating external expertise, analysing national policies' impact on local research communities, examining book peer review practices, developing comprehensive book evaluation frameworks beyond publisher prestige, and investigating a wider range of book metadata sources.

Samenvatting

Kwantitatieve onderzoeksevaluatie en de onbedoelde gevolgen ervan

Dit proefschrift biedt een uitgebreide analyse van de dynamiek van kwantitatieve onderzoeksevaluatie in Litouwen, een klein land dat na het herwinnen van haar onafhankelijkheid integreert in het wereldwijde onderzoekslandschap. Dit onderzoek bestudeert de historische ontwikkeling, beleidsimplicaties en gedragsmatige impact van praktijken van kwantitatieve onderzoeksevaluatie met aandacht voor de gevolgen die deze praktijken hebben voor zowel individuele onderzoekers, instellingen en onderzoeksresultaten. Door zich te richten op Litouwen, biedt het proefschrift diepgaande inzichten die relevant zijn voor talloze landen die worstelen met vergelijkbare uitdagingen in een geglobaliseerde wereld, en draagt het bij aan de lopende debatten over verantwoorde onderzoeksevaluatie.

Hoofdstuk 1 schetst de bredere context voor het proefschrift door de ontwikkeling van kwantitatieve onderzoeksevaluatie in Litouwen te analyseren. De Litouwse ervaring dient als een inzichtelijke case study voor andere landen die verantwoorde en effectieve onderzoeksevaluatie praktijken willen bevorderen. Het hoofdstuk onderzoekt externe evaluaties die Litouwen consequent afschilderden als "achterlopend" in onderzoek en innovatie, een narratief dat uitgebreide hervormingsplannen voedde. Rapporten van de Europese Unie benadrukten hardnekkige problemen zoals financieringstekorten, lage productie van onderzoek en zwakke internationale samenwerking. Als reactie hierop werden Litouwse staatsorganen, met name het Centrum voor Monitoring en Analyse van Onderzoek en Hoger Onderwijs, opgericht om hervormingen te sturen ondanks interne politieke spanningen. Het hoofdstuk constateert dat er een schaarste aan onafhankelijke analyses is van het Litouwse systeem van onderzoeksevaluaties in de bestaande academische literatuur. Het beschrijft de structuur van het systeem, gebaseerd op regelgeving voor academische graden, minimumeisen voor kwalificaties en het prestatiegericht financieringssysteem (PBFS). Tezamen vormen de componenten van dit systeem een sterke stimulans voor publicaties in internationale tijdschriften met hoge impact. Het hoofdstuk sluit af met een overzicht van de kerndoelstellingen van het proefschrift, de combinatie van kwantitatief en kwalitatief onderzoek (mixed methods) en met vijf belangrijke onderzoeksvragen over de rol van verschillende actoren in beleidsdynamiek, de evolutie van het prestatiegericht financieringssysteem, de vergelijkende evaluatie van boeken, het identificeren van boekuitgevers en de zichtbaarheid van Litouws onderzoek.

Hoofdstuk 2 onderzoekt de beleidsdynamiek tussen verschillende actoren die tussen 1996 en 2008 bijdroegen aan de ontwikkeling van kwantitatieve onderzoeksevaluatie in Litouwen. Toen Litouwen internationalisering begon na te streven, werden auteur- en tijdschriftgebaseerde statistieken belangrijker in de financiering van onderzoek en de promotie van onderzoekers. Deze hervorming ging gepaard met complexe interacties tussen internationale experts, nationale beleidsmakers, aanbieders van publicatiegegevens en academici die navigeerden tussen Sovjet tradities en internationale ontwikkelingen. Drie belangrijke dynamieken van meerdere actoren worden geïdentificeerd: de "expert dynamiek", die

illustreert hoe Litouwse beleidsmakers in contact kwamen met buitenlandse experts die het belang van internationale publicaties benadrukten; de "databank dynamiek", die de onbedoelde gevolgen onderzoekt van interacties tussen beleidsmakers, data-aanbieders (zoals Web of Science) en tijdschriftuitgevers; en de "academische dynamiek", die onderzoekt hoe onderzoekers, met name in de sociale wetenschappen en geesteswetenschappen, zich verzetten tegen opgelegde kwantitatieve maatregelen, wat leidde tot disciplinaire spanningen en een spraakmakende rechtszaak bij het Grondwettelijk Hof. Op basis van kwantitatieve en kwalitatieve methoden laat het onderzoek zien wat de uitdagingen zijn van het adopteren van internationale praktijken in een klein onderzoekssysteem in transitie; wat de invloed is van data-aanbieders en academische lobbyactiviteiten; en wat het belang is van het meenemen van verschillen tussen disciplines. De Litouwse casus biedt waardevolle lessen voor hervormingen van onderzoeksevaluatie elders, waarbij de nadruk ligt op een genuanceerde benadering en continue dialoog.

Hoofdstuk 3 duikt in de complexiteit van het Litouwse systeem van prestatiegerichte financiering vanaf de start in 2005 tot aan 2022. Met behulp van een multi-level, multi-actor en multi-issue kader analyseert het de rollen van belangrijke actoren – het Ministerie van Onderwijs, Wetenschap en Sport, de Onderzoeksraad van Litouwen, universiteiten, en wetenschappelijke elites – en hun omgang met elkaar. Zo stond het Ministerie voor uitdagingen in het betrekken van belanghebbenden terwijl de Onderzoeksraad aanliep tegen moeilijkheden in het waarborgen van de onafhankelijkheid van experts. Universiteiten reageerden strategisch op prestratieindicatoren door institutionele tijdschriften op te richten en internationale samenwerkingen aan te gaan. Deze reacties onderstrepen de dominante invloed van wetenschappelijke elites, die leidinggevende posities bekleden op overheids- en institutioneel niveau, wat leidde tot systemische spanningen. Het hoofdstuk onderzoekt hoe beleidsmakers navigeerden tussen internationale aspiraties en binnenlandse realiteiten. Waarbij ze zich aanvankelijk richtten op internationale publicaties, daar worstelden ze later met onbedoelde gevolgen daarvan zoals de proliferatie van binnenlandse WoS-geïndexeerde tijdschriften. Ook analyseert het hoofdstuk het controversiële beleid rondom "opgeschorte tijdschriften" op zijn inconsistenties en bespreekt het, aan de hand van casestudies, de evoluerende individuele en institutionele strategieën als reactie op het prestatiegerichte systeem. Het hoofdstuk concludeert met het benadrukken van de dominante rol van wetenschappelijke elites bij het vormgeven van prestatiegerichte financiering en de noodzaak van bredere betrokkenheid van belanghebbenden voor een evenwichtiger en effectiever systeem.

Hoofdstuk 4 onderzoekt methoden voor het identificeren van prestigieuze uitgevers in academische boek evaluaties. Daarbij worden Litouwse praktijken vergeleken met die van andere landen en wordt de consistentie en verifieerbaarheid van deze evaluaties onderzocht. Het hoofdstuk benadrukt het toenemende belang van de prestige van uitgevers in op metrics gebaseerde financieringssystemen, in tegenstelling tot kwalitatieve peer-review benaderingen. Een mixed methods benadering, inclusief kwalitatieve documentanalyse en een bibliometrisch onderzoek van Litouwse boekuitgaven (2004-2016), onthult belangrijke inconsistenties in de manier waarop Litouwse experts uitgevers in de loop van de tijd als 'prestigieus' classificeren terwijl een vergelijking met classificaties van uitgevers in Noorwegen, Denemarken, Finland

en Polen een gebrek aan internationale consensus aantoont. Het hoofdstuk onderzoekt ook formele definities van prestige van uitgevers, die vaak minder dan transparant blijken te zijn; een analyse van verschillende internationale uitgevers onthult verder moeilijkheden bij het verifiëren van naleving van de gestelde vereisten. De bevindingen suggereren dat de evaluatie van boeken op basis van de prestige van uitgevers subjectief en inconsistent is, zowel binnen Litouwen als internationaal. De discussie concludeert dat "prestigieuze uitgever" vaak slecht gedefinieerd is, wat de validiteit van ranglijsten met uitgevers als een primaire indicator van de kwaliteit van boeken ondermijnt. Het hoofdstuk roept onderzoekers op om zich in de toekomst te richten op bredere aspecten van boekpublicaties dan prestige, zoals kwaliteitscontrole, verspreiding en transparantie.

Hoofdstuk 5 verkent het potentieel van de ISBN-handleiding en het Global Register of Publishers (GRP) voor het begrijpen van praktijken van boek publicaties, met name binnen onderzoeksevaluatie in Litouwen en het Research Excellence Framework (REF) van het Verenigd Koninkrijk van 2008 tot 2020. Het contrasteert de Litouwse focus op het prestige van de uitgever met de Britse nadruk op inhoud en het groeiende belang van open access. Een mixed methods benadering onthult dat de ISBN-handleiding en GRP weliswaar waardevol zijn voor het identificeren van ingeschrevenen bij het ISBN maar dat het bepalen van het boek genre uitsluitend op basis van deze metadata uitdagend is. De analyse benadrukt de complexiteit van het identificeren van de daadwerkelijke boekuitgever vanwege de flexibiliteit van het ISBN-systeem en de uitdagingen die worden gevormd door imprints, fusies en overnames. De bibliometrische analyse van Britse en Litouwse boek-ISBN's met behulp van GRP-metadata biedt inzichten in de publicatie praktijken van onderzoekers waarbij verschillen in machtsconcentratie om te publiceren en voorkeuren voor bepaalde typen uitgevers aan het licht komen. De GRP blijkt een nuttige bron voor bibliometrische analyse van boekpublicaties, wat op zijn beurt de nadelen van het uitsluitend vertrouwen op de reputatie van de uitgever bij onderzoeksevaluatie verder illustreert. In plaats daarvan is een genuanceerde benadering nodig: een die rekening houdt met daadwerkelijke publicatie praktijken en aansluit bij wetenschappelijke communicatieprincipes zoals open access. Deze bevindingen onderstrepen het potentieel van ISBN- en GRP-gegevens voor beleidsvorming.

Hoofdstuk 6 pleit voor een verschuiving naar individuele boek evaluatie, in overeenstemming met de principes van open wetenschap, en bekritiseert de huidige nadruk op de prestige van uitgevers. Het hoofdstuk benadrukt de noodzaak van uitgebreidere statistieken die de volledige levenscyclus van een boek vastleggen en onderzoekt de beschikbaarheid van WorldCat-metadata en de zichtbaarheid van boeken die zijn ingediend voor nationale onderzoeksevaluaties in de Britse REF en Litouwse onderzoeksevaluaties (2008-2020). Een mixed methods benadering onthult dat WorldCat bijna complete primaire metadata (titels, talen, publicatie jaren) biedt, hoewel informatie over de bijdrager opschoning vereist en cruciale elementen zoals genre en peer-review status vaak ontbreken. Hoewel uitgeversinformatie in het MARC21-formaat voor bibliografische gegevens niet-gestandaardiseerd is, kan de GRP betrouwbaardere gegevens leveren. Wat betreft de zichtbaarheid leveren Duitse bibliotheken een belangrijke bijdrage aan de vindbaarheid van REF-boeken in WorldCat. In contrast is slechts twee derde van de Litouwse boeken aanwezig

in de WorldCat-catalogus, die primair afhankelijk is van Duitse, Amerikaanse en Poolse data-aanbieders vanwege een gebrek aan Litouwse institutionele bijdragen. Het hoofdstuk concludeert dat, hoewel WorldCat een waardevolle bron is voor onderzoeksevaluatie op boekniveau, de beperkingen op het gebied van genre, peer review en consistente open access informatie moeten worden aangepakt. Het benadrukt het belang van samenwerking tussen belanghebbenden om de volledigheid en toegankelijkheid van metadata te verbeteren, wat eerlijkere evaluatiepraktijken bevordert die aan het prestige van de uitgever voorbij gaan.

Hoofdstuk 7 loopt de belangrijkste bevindingen na, bespreekt de vervulling van onderzoeksdoelstellingen, stelt aanbevelingen op voor het Litouwse beleid rondom wetenschap en boek evaluaties en verkent toekomstige onderzoeksrichtingen. Het onderzoek onthulde de significante invloed van internationale experts op de Litouwse adoptie van kwantitatieve onderzoeksevaluatie en de onbedoelde gevolgen van het prioriteren van Web of Science-publicaties. Het benadrukte hoe de complexe dynamiek rondom prestatiegerichte financiering - gevormd door beleidsmakers, instellingen en invloedrijke academici - leidde tot problemen zoals de proliferatie van institutionele tijdschriften en het controversiële beleid voor het opschorten van tijdschriften. Het proefschrift toonde inconsistenties aan in praktijken van boek evaluaties in heel Europa, met name de subjectieve aard van het prestige van uitgevers. Verder stelde het proefschrift vast dat de ISBN-handleiding en GRP waardevolle hulpmiddelen zijn voor het identificeren van boekuitgevers en hun rollen voorbij louter reputatie. Ten slotte bleek dat, hoewel WorldCat potentieel biedt voor het verbeteren van de zichtbaarheid van Litouwse boeken, de metadata onvolledig is en er onvoldoende gebruik wordt gemaakt van lokale bijdragen. Dit PhD-onderzoek voldeed aan zijn doelstellingen door de evolutie van onderzoeksevaluatie in een transitiesysteem te analyseren, bij te dragen aan effectievere en verantwoordere evaluatiekaders voor kleinere landen, en het theoretische begrip van beleidsvormingsdynamiek binnen openbare wetenschapssystemen te vergroten.

Beleidsaanbevelingen omvatten het verminderen van de afhankelijkheid van externe expertise, het versterken van onafhankelijk onderzoek naar het Litouwse wetenschapssysteem, het beperken van risico aversie bij beleidsvorming, het afstappen van op prestige gebaseerde boek evaluatie ten gunste van open access en vindbaarheid, en het vergroten van de wereldwijde zichtbaarheid van Litouws onderzoek door verbeterde metadata en strategieën om data te behouden. Toekomstige onderzoeksrichtingen omvatten het onderzoeken van de oorsprong en impact van het narratief van “achterlopen”, het evalueren van alternatieve modellen voor het opnemen van externe expertise, het analyseren van de impact van nationaal beleid op lokale onderzoeksgemeenschappen, het onderzoeken van praktijken voor peer review van boeken, het ontwikkelen van uitgebreide kaders voor boek evaluatie die verder gaan dan het prestige van de uitgever en het onderzoeken van een breder scala aan bronnen voor de metadata van uitgegeven boeken.

Santrauka

Nenumatytos kiekybinio mokslo vertinimo pasekmės

Šioje daktaro disertacijoje išsamiai nagrinėjama kiekybinio mokslo vertinimo raida Lietuvoje. Kaip maža ir palyginti neseniai nepriklausomybę atgavusi šalis, Lietuva aktyviai integravosi į pasaulinę mokslo erdvę. Tyrimuose gilinamasi į nacionalinės mokslo vertinimo sistemos formavimąsi, atskleidžiant pagrindinių šio proceso dalyvių (užsienio ekspertų, valstybės įstaigų, aukštojo mokslo institucijų ir mokslininkų) įtaką jos raidai. Taip pat analizuojami Lietuvos mokslo rezultatai tarptautiniame kontekste, didesnį dėmesį skiriant mokslo knygų vertinimui ir jų matomumui kitų šalių mokslininkams. Sutelkiant dėmesį į Lietuvos pavyzdį, disertacijoje pateikiama vertingų įžvalgų, aktualių daugeliui mokslo tarptautiškumo siekiančių šalių, taip prisidedama prie diskusijų apie atsakingą mokslo vertinimą.

Pirmame skyriuje supažindinama su Lietuvos kiekybinio mokslo vertinimo kontekstu. Jame nagrinėjami išoriniai vertinimai, kuriuose Lietuvos mokslo ir inovacijų pasiekimai nuolat atsilieka nuo kitų šalių. Tarptautinių organizacijų ir Europos Sąjungos parengtose ataskaitose vis pabrėžiamos tokios Lietuvos problemos kaip nepakankamas mokslo finansavimas, nereikšmingas mokslo straipsnių skaičius reikšmingiausiuose mokslo žurnaluose ir tarptautinio bendradarbiavimo stoka. Tai paskatino mokslo politikus imtis įvairių mokslo sistemos reformų, buvo įsteigtas Mokslo ir studijų stebėsenos ir analizės centras, vykdantis tiek savarankiškus, tiek užsakomuosius tyrimus. Nors užsakomųjų tikslingų tyrimų daug, esamoje akademinėje literatūroje trūksta nepriklausomų Lietuvos mokslo vertinimo sistemos analizių. Šiame skyriuje taip pat išsamiai aprašoma Lietuvos kiekybinio mokslo vertinimo sistema ir jos sudėtinės dalys: kaip suteikiami moksliniai laipsniai ir įdarbinami mokslininkai ir dėstytojai, nustatant taikomus minimalius kvalifikacinius reikalavimus. Ne mažiau svarbi mokslo skatinimo sistemos dalis – valstybės finansavimo paskirstymas mokslo institucijoms, remiantis kiekybiniais rodikliais. Visos priemonės susijusios ir skirtos skatinti Lietuvos mokslininkus publikuoti savo mokslo straipsnius tarptautiniuose žurnaluose, turinčiuose aukštus cituojamumo rodiklius. Skyriaus pabaigoje pristatomi pagrindiniai disertacijos tikslai, pagrindžiami pasirinkti tyrimo metodai. Penki tyrimo klausimai ir atlikti tyrimai pristatomi kituose skyriuose.

Antrame skyriuje nagrinėjami pagrindiniai veiksniai, padarę didžiausią įtaką Lietuvos kiekybinio mokslo vertinimo sistemos formavimuisi ir jos raidai 1996–2008 m. Lietuvai siekiant narystės Europos Sąjungoje ir kitose tarptautinėse organizacijose, pastarųjų atlikti Lietuvos mokslo sistemos vertinimai atskleidė pagrindinį jos trūkumą – mažą mokslo straipsnių skaičių tuometėje pagrindinėje JAV mokslinių publikacijų duomenų bazėje „Web of Science“, pagal kurią buvo lyginamos šalių mokslo sistemos. Tuomečiai mokslo politikai, siekdami sparčiai pasivyti „Web of Science“ jau įsitvirtinusius Vakarų šalių mokslininkus, straipsnius šioje bazėje indeksuotuose žurnaluose tiesiogiai susiejo su finansinėmis paskatomis ir mokslo laipsniais. Šios mokslininkams skirtos paskatos gyvuoja iki šiol, nepaisant gausybės nenumatytų neigiamų pasekmių. Skyriuje pristatomos sąveikos tarp užsienio ekspertų, nacionalinių politikos formuotojų, užsienio duomenų bazių valdytojų,

Lietuvos mokslo žurnalus leidžiančių institucijų ir mokslininkų, laviruojančių tarp sovietinių tradicijų ir vakarietiškų tendencijų. Tyrimas atskleidžia tris pagrindines šių veikėjų sąveikas. „Ekspertų dinamika“ iliustruoja tarptautinių publikacijų stoką pabrėžiančių užsienio ekspertų darytą įtaką Lietuvos politikos formuotojams. „Duomenų bazių dinamika“ nagrinėja sąveikas tarp mokslo politikos formuotojų, duomenų bazės „Web of Science“ indeksavimo politikos ir Lietuvos mokslo žurnalų leidėjų strategijų per specialius mokslo žurnalų ir duomenų bazių sąrašus. „Mokslininkų dinamika“ tiria, kaip socialinių ir humanitarinių mokslų mokslininkai priešinosi tiksliųjų mokslų atstovų primestiems kiekybiniams rodikliams, sukeldami tarpdisciplinines įtampas, kurios atvedė mokslo politikus į Konstitucinį Teismą. Naudojant mišrius tyrimo metodus, šis tyrimas atskleidė itin sudėtingą kiekybinio mokslo vertinimo formavimąsi mažoje šalyje, pereinamuoju laikotarpiu siekusioje kuo aukštesnių tarptautiškumo rodiklių, matuojamų mokslo straipsniais visų šalių geidžiamuose užsienio žurnaluose.

Trečiame skyriuje nagrinėjamas kiekybinis Lietuvos mokslo institucijų vertinimas, kurio tikslas – paskirstyti valstybės finansavimą mokslo veikloms ir doktorantūros studijoms. Naudojant daugialypę veikėjų ir problemų analizės perspektyvą, šis tyrimas atskleidžia pagrindinius institucinio kiekybinio mokslo vertinimo veikėjus, dariusius įtaką jo raidai nuo įsteigimo 2005 m. iki 2022 m. Skyriuje analizuojami Švietimo, mokslo ir sporto ministerijos, Lietuvos mokslo tarybos, universitetų ir mokslo elito vaidmenys bei jų tarpusavio sąveika. Pagrindinis sprendimų priėmėjas buvo ir yra Ministerija, nors Lietuvos akademinėje bendruomenėje vis dar sklando nuomonė, kad Mokslo taryba yra atsakinga už prastą mokslo vertinimo sistemą. Tačiau ši, kaip Ministerijos sukurtos vertinimo sistemos administratorė, susidūrė su ekspertų šališkumu, dėl to Lietuvoje įvestas kiekybinis (ne ekspertinis) mokslo vertinimas (žr. antrą skyrių). Nuodugni šio vertinimo sistemos analizė atskleidė, kad vyriausybės ir institucijų lygmenyse lyderių pozicijas užimantys mokslininkai, jų priimami sprendimai ir veiksmai kėlė įtampas mokslo bendruomenėje ir formavo mokslo vertinimo sistemą. Skyriuje nagrinėjami pokyčiai mokslo vertinimo reikalavimuose ir tam tikrais laikotarpiais įvedamos priemonės atskleidžia mokslo politikos formuotojų iššūkius, kuriuos lėmė specifinės realijos mokslo bendruomenės viduje ir kuo didesnio tarptautiškumo siekis. Dar viena iš nenumatytų pasekmių – itin aukšti Lietuvos institucinių žurnalų rodikliai „WoS“ duomenų bazėje – patraukė ne tik mokslo politikų, bet ir užsienio universitetuose daktaro laipsnius gavusių lietuvių asociacijos dėmesį. Šios asociacijos nariai Lietuvos žiniasklaidoje paviešino abejotinas universitetų strategijas pagerinti mokslo rodiklius ir gauti didesnį valstybės finansavimą. Atsakydami į paviešintą informaciją, mokslo politikai inicijavo prieštaringą „neįskaitytų žurnalų“ priemonę, kuri, nukreipta prieš tam tikras institucijas ir jų žurnalus, paskatino Lietuvos mokslininkus publikuotis užsienio žurnaluose. Kita nenumatyta šios politikos pasekmė – gausus Lietuvos mokslininkų publikavimasis užsienio ekspertų prieštaringai vertinamuose žurnaluose. Skyrius baigiamas pabrėžiant dominuojantį mokslo elito vaidmenį formuojant kiekybinį, labiau subalansuotą institucinį mokslo vertinimą, kuriam atsverti reikėtų platesnio suinteresuotųjų šalių įtraukimo.

Ketvirtame skyriuje nagrinėjant prestižinių leidėjų nustatymo metodus, dėmesys sutelktas į mokslo knygų vertinimą. Lietuvos praktika lyginama su kitų šalių patirtimi, vertinant kriterijų

nuoseklumą ir patikimumą. Pabrėžiama, kad kiekybiniais rodikliais grįstose mokslo finansavimo sistemose vis dažniau pasikliaujama leidėjo prestižu, kuriam nustatyti pasitelkiami mokslininkai (mokslo elitas). Reikšmingi nenuoseklumai nustatant leidėjo prestižą atskleidžiami pasitelkus mišrių metodų instrumentus, apimančius kokybinę užsienio ir Lietuvos leidėjų reitingavimo dokumentų ir bibliometrinę analizes. Bibliometrinei analizei naudoti Lietuvos institucijų mokslo vertinimui pateiktų 2004–2016 m. išleistų knygų bibliografijos. Pasirodo, Lietuvos ekspertai vienais metais knygų leidėjus klasifikuoja kaip prestižinius, kitais metais tuos pačius leidėjus iš šio sąrašo išbraukia. Maža to, nenuosekliai vertinamų leidėjų statuso palyginimas Norvegijos, Danijos, Suomijos ir Lenkijos leidėjų reitinguose atskleidė dar didesnę įvairovę: skirtingų šalių mokslininkai tuos pačius knygų leidėjus vertina skirtingai. Taigi, tarptautinio sutarimo nėra ir negali būti nes kiekvienoje atskiroje šalyje prestižinių leidėjus nustato tos konkrečios šalies įgalioti mokslininkai remiantis savo nuostatomis ir patirtimis. Tyrimo išvados rodo, kad knygų vertinimas pagal leidėjo prestižą yra subjektyvus ir nenuoseklus tiek Lietuvoje, tiek tarptautiniu mastu. Skyriuje taip pat analizuojami formalūs Lietuvos teisės aktuose paskelbti prestižinio leidėjo apibrėžimai, kurie nepadeda identifikuoti geriausio leidėjo. Diskusijoje daroma išvada, kad miglotas „prestižinio leidėjo“ apibrėžimas naudos nesuteikė, nes Lietuvoje prestižinėmis pripažintos leidyklos kitose šalyse neturi išskirtinio statuso. Skyrius baigiamas raginimu ateityje atlikti tyrimus, sutelkiant dėmesį į platesnius knygų leidybos aspektus, tokius kaip leidėjo vykdomų procesų skaidrumas, kokybės kontrolė per knygų recenzavimą ir knygų sklaida.

Penktame skyriuje nagrinėjamas Tarptautinės ISBN agentūros standartas ir Pasauliniame leidėjų registre (angl. Global Register of Publishers, toliau – GRP) esantys ISBN metaduomenys, siekiant nustatyti knygų leidybos praktikas. Svarbu išsiaiškinti, kaip veikia ISBN sistema, nes daugelyje pasaulio šalių mokslo vertinimo reikalavimuose knygos privalo turėti ISBN kodą. Empirinei analizei buvo pasitelkti ISBN kodai knygų, kurias Lietuvos ir Didžiosios Britanijos mokslo institucijos pateikė mokslo vertinimui nuo 2008 iki 2020 m. Svarbu pabrėžti, kad Lietuvos mokslo vertinimo sistemoje sureikšmintas leidėjo prestižas, tuo tarpu Didžiojoje Britanijoje mokslo politikai kelia reikalavimus atvirajai skaitmeninių knygų prieigai, nors institucijos pirmenybę teikia tradicinėms leidykloms. Skyriuje taip pat demonstruojama, kad ISBN kodas ir GRP patikimai nustato, kas užregistravo ISBN kodą ir yra atsakingas už knygos turinį pagal ISBN standartą. Tačiau kartais nustatyti faktinį knygos leidėją ganėtinai sudėtinga dėl ISBN sistemos lankstumo, nes leidėju gali būti bet kas. Be to, kai kurie leidėjai turi ne vieną, o daugybę prekės ženklų, kuriuos sujungti ir nustatyti ryšius su pagrindine kompanija ganėtinai sudėtinga, vien GRP duomenų nepakanka. Nepaisant šių trūkumų, GRP yra puikus duomenų šaltinis bibliometrinei analizei atlikti. Pavyzdžiui, naudojant Jungtinės Karalystės ir Lietuvos knygų ISBN kodus, šio registro duomenys suteikė įžvalgų apie šių šalių mokslininkų knygų leidybos ypatumus ir įtakingiausius leidėjus. Šis tyrimas reikšmingas dėl gilios Tarptautinio ISBN standarto analizės, be to, atskleidė GRP potencialą ir galimybes informuoti mokslo politikų sprendimus.

Šeštame skyriuje, atlikus tyrimą, skatinama pereiti prie individualaus knygų vertinimo, atsižvelgiant į atvirojo mokslo principus, ir kritikuojamas dabartinis leidėjo prestižo

sureikšminimas. Jame pabrėžiama, kaip svarbu surinkti kuo daugiau knygos metaduomenų, apimančių visą knygos gyvavimo ciklą, ir tuomet atlikti visapusišką knygų vertinimą. Šiuo tikslu skyriuje tiriamas „WorldCat“ metaduomenų prieinamumas ir mokslo knygų matomumas, empiriniam tyrimui pasiteikiant tuos pačius Didžiosios Britanijos ir Lietuvos mokslo knygų ISBN kodus kaip ir penktame skyriuje. Tyrimas atskleidžia „WorldCat“ metaduomenų gausą. Turint tik ISBN kodą, galima surinkti beveik išsamius pirminius knygų metaduomenis (pavadinimus, kalbas, leidimo metus), nors autorių ir prisidėjusiųjų informaciją reikia sutvarkyti. Minėtina, kad mokslo vertinimui svarbių metaduomenų, tokių kaip knygos žanras ir recenzavimo statusas, dažnai trūksta. Leidėjo laukas MARC21 bibliografinių duomenų formate yra nestandartizuotas ir atrodo netvarkingai, todėl GRP (aptartas penktame skyriuje) yra patikimesnis duomenų apie leidėjus šaltinis. Pirminių knygų metaduomenų įrašų savininkų analizė atskleidė knygų metaduomenų tiekėjus: ne knygų leidėjai, o nacionalinės bibliotekos ar specializuotos knygų platinimo kompanijos šiam tarptautiniam knygų katalogui teikia daugiausiai metaduomenų. Pavyzdžiui, Vokietijos bibliotekos prisidėjo prie Didžiosios Britanijos knygų matomumo „WorldCat“ sistemoje reikšmingiau nei leidėjai ar Britanijos bibliotekos. Praktiškai visos britiškos knygos turi išsamius metaduomenis, o Lietuvos autorių knygos – ne. Tik du trečdaliai jų randamos „WorldCat“ kataloge, ir tik dėl Vokietijos, Amerikos ir Lenkijos duomenų teikėjų: neprisidėjo nė viena Lietuvos biblioteka ar institucija (būtent Lietuvoje išleistų knygų nemato pasaulis). Skyriuje daroma išvada, kad nors „WorldCat“ yra vertingas privalomųjų ir pagrindinių knygų metaduomenų šaltinis, jame trūksta atvirosios prieigos ir informacijos apie knygos recenzavimą. Pabrėžiama suinteresuotųjų šalių bendradarbiavimo svarba gerinant knygų metaduomenų išsamumą ir prieinamumą, kurie paskatintų atsisakyti leidėjo prestižo kriterijaus ir palaipsniui pereiti prie individualių knygų vertinimo.

Septintame skyriuje apibendrinamos disertacijos išvados, aptariamas tyrimo tikslų įgyvendinimas, ateities tyrimų kryptys ir rekomendacijos Lietuvos mokslo politikai ir knygų vertinimui. Remiantis atliktu tyrimu, rekomenduojama siekti mažesnės priklausomybės nuo užsienio ekspertizės formuojant vidaus mokslo politiką ir skatinti nepriklausomus Lietuvos mokslo sistemos tyrimus. Taip pat siūloma keisti atgyvenusias mokslo vertinimo tvarkas, atsisakyti prestižinio knygos leidėjo kriterijaus, vietoj to atsižvelgti į atvirąją prieigą ir skaitmeninį formatą bei tobulinti knygų metaduomenų parengimą ir atvėrimą. Šios priemonės padėtų didinti Lietuvos mokslinių tyrimų matomumą pasaulyje.

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Eleonora Dagienė was born in Kaunas, Lithuania, in 1963. She completed her secondary education in Kaunas in 1980 and subsequently commenced her university studies. In 1985, she obtained a computer engineer diploma from Kaunas University of Technology (formerly Kaunas Politechnical Institute). In 1998, she earned a Master of Science degree in Management from Vilnius Gediminas Technical University, Lithuania.

In November 2018, Eleonora began her doctoral research at The Centre for Science and Technology Studies (CWTS), Leiden University, under the supervision of Professor Ludo Waltman, Professor Vincent Larivière (University of Montreal), and Assistant Professor Guus Dix (University of Twente). Her research focuses on bibliometric research, research assessment policies and their multi-actor dynamics, and book evaluation practices, whilst advocating for open science principles and exploring book metadata sources. Eleonora's PhD research has been published in the journals *Research Evaluation*, *Quantitative Science Studies* (QSS), *Scientometrics*, and *Higher Education Policy*.

Prior to her PhD, Eleonora had an extensive professional experience in academic publishing, having led a university press from 2006 to 2019. Actively implementing innovations in academic publishing, she further contributed to the scholarly communication community by serving on the Crossref board and co-founding and leading the Association of Lithuanian Serials. Since 2021, she has been a researcher at Mykolas Romeris University, where she actively advocates for Open Science, teaches research methodologies, and shares her research insights through her blog in Lithuanian (https://eleonoradagiene.lt).

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