How to Silence Researchers?
Evidence from Illiberal Policies in Hungary *

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Abstract

We explore how contemporary attacks against academic freedom and illiberal policies have detrimental effects on innovation, focusing on academic research. Using rich national research repositories and international bibliometric data, we show that academics' research trajectories diverge sharply depending on their perceived political alignment and investigates the mechanisms explaining this difference. Academics perceived as political opponents experience large declines both in publication output and collaboration networks, each falling by about one quarter relative to pre-shock levels. Researchers working on politically sensitive topics are also disproportionately affected: they experience a 10% decline in total publications and a 30% decline in publications in top journals. Targeted researchers experience a loss of co-authors and are likely to shift their research agendas in response to these threats. Finally, we conduct cross-country comparisons at the individual level to estimate the global effect of the declining academic freedom. We find that Hungarian researchers increasingly reallocate their publication efforts toward lower-ranked national-language journals and are more likely to leave the country altogether.

Key words: Academia, Hungary, Illiberalism, Innovation, Scientific productivity

JEL codes: I20, I23, J24, N14, O38

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1 Introduction

Since the fall of the Soviet Union, the dominant view in political science was that the liberal democratic model would start expanding and prevailing. One of the contradictions caused by this "end of History" (Fukuyama, 1989) in the West consists in the rising electoral base of far-right parties that question key elements of liberal democracy, from the rule of law to impartiality of the State regarding elections and protections for minorities. In order to describe the type of policies that such parties conduct when they come into power, Zakaria (1997) popularised the term "illiberal democracies", emphasizing the distinction between political and civil liberties – showing that free elections can lead to limitations to freedom of press and freedom of expression.

The last two decades have witnessed the rise of several regimes that have been characterized as "illiberal democracies" or as undergoing democratic backsliding. The term "illiberal", however, partly ceased to function as a pejorative label used by critics in 2014, when it was openly embraced by Viktor Orbán, the current Prime Minister of Hungary. In a widely cited speech, Orbán contrasted national identity and community with liberal values and individualism, framing this opposition as a justification for the broad institutional changes implemented by his party, Fidesz, following its unexpected landslide victory in 2010. These changes included the adoption of a controversial new constitution and the complete restructuring of several independent authorities, such as the judiciary and the media regulatory bodies.

A defining feature of such regimes is the pressure they exert on both minorities and institutional elites, such as intellectuals, journalists, and members of the judiciary. Academic freedom often becomes a primary target in this context. Academic freedom can be defined along two dimensions : the first is the "freedom to question and test and develop new ideas without undue harassment or interference" (Russell, 2002), i.e., research freedom at the individual level. While speeches from Viktor Orbán and articles by the State-aligned press appear to show such kind of pressures, both for economic reasons and for explicitly political justifications, the law does not directly address this dimension. However, the successive Orbán government have passed a number of laws that undermine the second aspect of academic freedom, which we define as the right to institutional autonomy for universities. Therefore, we expect those reforms to be turning points for productivity and quality of academic research in Hungary. While our research focuses on Hungary, we believe that we are describing a phenomenon with global implications. Several right- and far-right political leaders over the world have claimed to look up to Orbán as an example of good governance. In particular, current US President Donald Trump, who explicitly cultivates ties with Orbán and draws inspiration from his actions, has launched an assault on science from February 2024 on, cutting funding to universities and research projects on the basis of misalignment of research topics to the political positions of the Republican party. Given the rise of references to Orbán's governance by populist parties in most democracies, from France to Germany, Israel or India, with a discourse directly praising the new Hungarian State, it is crucial to understand its material consequences on science.

We believe that one of the benefits of civic liberties is that it allows free scientific research and innovation, thereby fostering the creation and the sharing of ideas. While the regime instituted by Viktor Orbán is not considered as a dictatorship, academic freedom has been under threat in Hungary, as well as other civic liberties. If these freedoms are important determinants of academic research, it should at least suffer moderate negative consequences.

This paper aims to examine the consequences of illiberal policies on innovation, with a particular focus on the mechanisms through which academia and researchers are affected. More precisely, our analysis is organized around two main research questions. First, is there evidence of political pressures on academics in Hungary? This part of the analysis focuses on the behaviour of researchers when directly confronted with political threats. We draw explicitly on the "Exit, Voice, and Loyalty" framework from Hirschman (1972), adapted to the political context, in which scholars facing political repression may choose to emigrate, express dissent, or comply with the new demands of the illiberal regime. Second, what is the overall impact of illiberal policies on innovation? In order to answer both questions, we argue that the Hungarian experience since 2010—particularly policies that threaten academic freedom—constitutes a quasi-natural experiment that allows us to precisely quantify the effects of such political shocks in terms of innovation performances.

To answer these questions, we use rich bibliometric data that allow us to measure scientific outcomes for researchers based in Central European countries. Our primary dataset is constructed from national bibliometric repositories of several Central European countries, which harmonize to create a comprehensive dataset representing the whole research activity across the region. In addition, we rely on OpenAlex—an international, centralized database with detailed information on co-authorship networks and institutional affiliations—which enables us to analyse international collaborations and researcher mobility. From these two types of sources, we construct a broad panel dataset of researchers dating back to 1990, allowing us to track academic outcomes over time.

To address our first research question, we study whether or not researchers within Hungary are differentially affected by their perceived political positions. We categorize researchers based on whether their perceived political alignment is supportive of, neutral toward, or opposed to the illiberal governments—and estimate the impact of political threats on their academic performance. We find that researchers that are perceived as political opponents experience a significative drop in the total number of publications they publish, as well as in the number of publications they publish in top journals. These researchers are also more isolated and collaborate less with their Hungarian colleagues. Conversely, researchers that are perceived as supportive of the regime experience small positive effects on their average number of publications or on the number of collaborations with other Hungarian researchers per year. All these effects intensify through the years and successive mandates of Viktor Orbán, suggesting that the stronger and longer the pressure on researchers, the higher the negative consequence on their performance. To extend these results, we apply the "Exit, Voice, and Loyalty" framework and demonstrate that

politically targeted researchers are more likely to leave Hungary and to obtain affiliations abroad. We also analyse the content of publications in our database to demonstrate that these researchers are more likely to "voice"—that is, to publicly express dissent—compared to researchers who are not perceived as political opponents. Finally, we examine research direction by comparing the trajectories of scholars researching gender — a multidisciplinary field that has been heavily criticized by the government and pro-Orbán media – and other heavily politicized subjects with those of researchers in other disciplines. We find that such researchers are also disproportionately affected, experiencing a decline in their total number of publications of about 5% of the pre-Orbán average.

Second, we compare trends in Hungarian scientific publishing to those in other similarly sized Central European countries—specifically, Slovenia and Croatia. Using matching procedures and a difference-in-differences strategy, we compare author-level outcomes across countries. We show that the main conjoined effect of the university reforms and political regression is surprisingly an increase in the number of publications, but exclusively in Hungarian. In the period from 2010 to 2020, researchers based in Hungary publish an additional 13% number of publications per year compared to researchers based in other Central Europe countries. We demonstrate that Hungarian researchers face an isolation phenomenon, characterized by a decoupling between "national" collaborations and "international" collaborations. Additionally, the perceived quality of Hungarian research also appears to suffer as publications in top journals decrease of about 60% at the end of the period. The number of co-authors within Hungary compared to co-authors within Slovenia for the control also increases for the treated. Using this track record, we find that authors identified as being in Hungary before 2010 are 1.3 percentage point more likely not to publish in Hungary for three continuous years after 2010. Their publications with international co-authors also fall by over 25%. We believe that these results show that rather than a loss of aggregate productivity, the impact of illiberalism in Hungary is a relative retreat of research into the country itself, that can only be escaped through leaving.

The strand of the literature in economics of innovation closest to this paper consists of recent works that focus on the impact of political shifts on innovation. A first part of this literature especially focuses on the political pressures that are exerted on academics. Acemoglu et al. (2022) show that, through shifts at the head of the university, Communist Party leaders in China exert pressure on universities, significantly changing research direction. Jia et al. (2022) and Aghion et al. (2024) show to what extent respectively US and Chinese academia have been impacted by US sanctions and the cost to total science from the loss of collaborations between China and the US. From a historical perspective, political conflicts are demonstrated to also have a consequent impact on the academic performance of researchers, for instance due to the First World War (Iaria et al., 2018), or the Second World War and the Nazi regime (Waldinger, 2012; Moser et al., 2014; Waldinger, 2016; Becker et al., 2024), or during Mao's Cultural Revolution when researchers were showing their disapproval of the leader's ideological line (Kung and

Wang, 2021). Our paper differs from this literature in the following ways. First, the setting is different: rather than an authoritarian dictatorship, we focus on a more recently appeared type of repression in the shape of illiberal democracy. Second, we attempt to extend the analysis of innovation costs of political repression from a small treated group to the entire population of researchers within a country. To the best of our knowledge, this is the first attempt at generalising this approach. One work closely related to ours is the one of Rohner et al. (2026), who find that economists strongly respond to the political threats on funding after the publication by the U.S. government of a list of undesirable words in 2025. Our analysis differs by exploring effects of illiberalism over a longer time horizon and a wider set of fields.

We also draw from the wider literature related to location choice and migration of innovators (Akcigit et al., 2013; Bahar et al., 2022; Lerner et al., 2023) in order to assess the effect of the regime on migration behaviour. We also contribute to the debate on the opposition between the Hungarian government and the Central European University by presenting the first empirical estimate of the impact of the decision on departures from Hungary.

We also use measurement methods and concepts of productivity from a broad literature in economics of innovation, focusing on external determinants of researcher productivity (Azoulay et al., 2011; Aghion et al., 2023; Carayol et al., 2023). In particular, Azoulay et al. (2010) analyse the impact of losing a star co-author on publication quantity and quality; we look at another type of adverse shock, using similar methods. This literature extends beyond economics, and we rely on methods and measurements devised to evaluate academic outcomes in the scientometrics literature (Kronegger et al., 2011).

Our paper also builds on the political and administrative science literature characterising illiberal democracy. The term first appeared in the literature to describe developments in South-East Asia (Bell et al., 1995) before it started being used more widely after the publication of Zakaria (1997). In the Hungarian context, we expand on the precise qualitative description of regime change (Bankuti et al., 2012a; Boda et al., 2015; Halmai, 2018; Buzogány, 2020) and academic freedom constraints (Kováts, 2015; Kováts and Rónay, 2021; Kováts et al., 2024).

Finally, our paper contributes to the emerging field of meta-analyses in bibliometrics along two dimensions. We aim at helping the field understand to which degree and under which conditions researchers are comparable across countries, following Kwiek (2016), which showed that European top researchers are likely to be comparable. Our paper shows that while the premise of this research is right, political choices in a researcher's country of work may have lasting impacts on their careers that make them systematically different from countries in which such choices have not been made. Moreover, we contribute to the emerging union of the literatures pertaining to the analysis and evaluation of respectively international databases (Boyack et al., 2014) and national research information systems, in particular for Central Europe (Hladík and Renisio, n.d.). While our paper is not the first to compare trends in global and national systems (van Leeuwen et al., 2016; Háló and Demeter, 2023), it is the first to perform the analysis across all disciplines as well as the first to compare, at the level both of researchers and publications,

the overlap between national and international databases across different countries, allowing us to better understand the advantages and shortcomings of both types of data. We believe that we make a strong contribution to this literature in using both types of data at once. Instead of using a singular database, we combine an international and centralised database with several national, decentralised databases. This second type of data is more precise regarding national publications and author profiles. In particular, this allows us to consider social sciences and humanities in our analysis. Usually, due to poor coverage in worldwide databases, these disciplines are often excluded as a whole from scientometric papers. Our inclusion of social sciences and humanities has direct applications to the problem at hand, given that they are typically the primary targets of anti-intellectualist speech and therefore likely to be especially hurt by the regime, but similar methods ensuring the presence of social scientists in the data could also be used in other applications of science of science. This use of different databases also helps us ensure that we consider not only the full universe of researchers for the countries included in our study, but also the entire set of articles, in particular those that are not written in English. Moreover, our process to identify entities through different databases is replicable and can be applied to other Current Research Information Systems and international databases.

The remaining of the paper is organised as follows. Section 2 describes the political and academic context of Hungary after Viktor Orbán's election of 2010. In Section 3, we detail our data collection work, define the variables we use in the analysis and detail the empirical strategy we implement. Section 5.2 presents our second set of results, showing how illiberal policies and political pressures impact researchers heterogeneously depending on their political alignment. Section 6 presents our results regarding the global impact of illiberalism on impacted researchers. Section 7 finally concludes.

2 Political Context, *Illiberalism* and Threats to Academic Freedom

During the general election of April 2010, Viktor Orbán's party, the Fiatal Demokraták Szövetsége (*Alliance of Young Democrats*, Fidesz), unexpectedly obtained a supermajority, receiving 53% of the vote and 68% of the seats in Parliament, defeating the former socialist majority. These electoral results marked a turning point in Hungary's modern political history. At the time of the election, Fidesz proposed a right-wing and conservative program aimed at creating a "new social contract for the country." The party's large electoral victory was interpreted by its leaders as a general rejection of liberal values by the Hungarian people, opening the way for structural changes in the state's organization to reflect new conservative values (Pap, 2017). Viktor Orbán, as leader of Fidesz, became Prime Minister of Hungary in May 2010. His government quickly began implementing reforms aligned with what he described as

'non-liberal' principles[1].

According to several international organizations and NGOs, there are multiple dimensions through which post-2010 governments have facilitated Hungary's transition from a 'liberal' to an 'illiberal' democracy[2]. A new Fundamental Law is promulgated on April 25, 2011, which weakens several components of the system of checks and balances that previously limited governmental power. In several independent authorities (in particular the judiciary and the media authority), the Parliament dismissed existing leadership and replaced them with party affiliates, expanded their powers, and made their removal procedures significantly more restrictive (Bankuti et al., 2012b). More generally, since the 2014 general elections, Hungary's electoral process has been characterized as "free but unfair" (Bíró-Nagy, 2017), particularly due to restrictions on political advertising that have created unequal conditions for electoral competitors[3]. For instance, Kelemen (2017) highlights the chilling effect of Article 81 of Act CLXXXV on Media (2010), which grants regulators discretionary broad authority to sanction journalists whose content is deemed not "balanced, accurate, thorough, objective, and responsible". The European Commission for Democracy through Law has similarly criticized this law as overly broad and discretionary [4].

Throughout all of the steps towards illiberalism, academic freedom in particular was increasingly targeted through different means. While the state of academic freedom had been constant since the fall of the East Block, Hungary experienced a sharp decline in academic freedom after 2010[5]. In this paper, we consider that academic freedom has two dimensions. First, we use the researcher-centric definition given by Russell (2002), who defines academic freedom as the "freedom to question and test and develop new ideas without undue harassment or interference". In addition, we also consider a university-centric definition, from a historical perspective, in which we define academic freedom as the institutional right to autonomy for academic institutions. While we can consider the first dimension to be continuously threatened since 2010, this section focuses on 3 salient reforms during which the second was breached, all linked to electoral cycles. First, while the new Act on Higher Education in 2011[6] was already a major

[1] In the Hungarian context, the adjective "illiberal" used to describe Viktor Orbán's policies is not a pejorative label only employed by political opponents as can be the case in other European countries but rather as a self-description. This became especially evident after July 2014, when Viktor Orbán explicitly described his governance model as an "illiberal democracy" in a famous public speech. See Viktor Orbán's Speech at the 25th Bálványos Summer Free University and Student Camp.

[2] Human Rights Watch or Amnesty International consistently report on threats to the rule of law in Hungary and the threats to democratic institutions.

[3] See the OSCE / ODIHR Limited Election Observation Mission report.

[4] Opinion No. 798/2015 of the Venice Commission.

[5] This is particularly striking when considering the Academic Freedom Index (AFI) developed by V-Dem for Hungary. While it is constant between 1991 and 2010 at 0.95, it drops to 0.63 already in 2011 and keeps declining down to 0.3 in 2022, the lowest level among all the members of the European Union. See Figure A.1.1 and Figure A.1.2.

[6] Act CCIV of 2011, in which "autonomy" and "freedom" were no longer guaranteed but replaced by the necessity of "the spiritual and intellectual renewal of the nation". Furthermore, university rectors – who are responsible for professor recruitment, formerly elected by their peers, had to be appointed by the Prime minister.

turning point, it was overturned in 2014 to turn to another method of control of universities through a new position, still appointed directly by the Prime Minister. Chancellors have the responsibility of managing the university's financial resources, which undermines the power of rectors and allows the State to maintain a certain level of control over the university's choices. Moreover, up to a third of the appointed chancellors have a connection to the ruling party (Kováts, 2015). Although this position was somewhat mitigated by the introduction of a supervisory board to which both the rector and the chancellor belonged in 2015, its introduction led to an outcry in public universities, as it amply mitigated the power of rectors and muddies the line between university management and the government (Rónay, 2018). This process was further by the introduction of consistories in 2015, financial boards in which four out of five members were named by the government.

Secondly, as part of the campaign leading up to the 2018 legislative elections, the Central European University (CEU), founded and funded by billionaire George Soros, was targeted as early as late 2017. This led to a legal battle that forced the university to definitively relocate to Vienna in 2019. Directors and more generally all professors affiliated to the University were accused of being both the agent of external forces and of "social degeneracy", specially due to the existence of gender studies classes (Enyedi, 2018). The final and largest changes imparted on public higher education by the government has been the "regime change" started in 2018, when the Budapest University of Economic Sciences, now called Corvinus University Budapest, became owned by a public interest foundation. This model was then applied to 20 other public universities comprising the majority of university students in the country until 2022. While this seems to relax the State constraints in universities, the boards of these public interest universities comprise many Fidesz-aligned trustees (Szent-Iványi and Tétényi, 2022), including up to a third of Fidesz politicians, not including others who are supportive of the party (Kováts et al., 2024).

Although organizational reforms have been the primary lever used to undermine academic freedom, the threats to the individual aspect of academic freedom should not be minimized. Reforms have indeed been accompanied by an increased pressure on researchers through State-aligned media, which labels government critics as wasteful or politically motivated, rather than driven by science (Kováts and Rónay, 2021). Fidesz and pro-Orbán media have pressured researchers through campaigns that accuse them of collaborating with NGOs or affiliating with institutions perceived as opponents. These campaigns have been particularly aggressive against academics, often utilizing traditional populist rhetoric targeting elites and minorities. For example, the campaign against Central European University was seen as particularly

aggressive toward scholars, frequently employing antisemitic rhetoric (Jenne et al., 2022)[7]. We provide more details on the political context and the threats to researchers and academics freedom in Appendix A.

3 Academic Data Collection

We conduct our analysis using bibliometric data coming primarily from two types of sources. The first type consists of several national-level databases on research activities, that are specific to each country included in our analysis. The second is OpenAlex, an open-access, world-wide publications database constructed from Microsoft Academic. We combine these sources to build our final datasets.

3.1 Current Research Information Systems

Our first type of data source is an aggregation of several national Current Research Information System (CRIS) databases. These datasets are national-level repositories that document all research activities within a country, typically established in the 2000s as part of a global effort to enhance research transparency. These datasets generally contain either data about researchers and their publications or project-level data, though some are publication-level databases. In addition to Hungary, we also consider several countries from Central-Eastern Europe, specifically Croatia and Slovenia[8] . All of these databases are part of the EuroCRIS initiative, ensuring they comply with similar standards[9], and thus converge to the Common European Research Information Format, which allows us to exploit these databases together in spite of their idiosyncrasies. Researchers also have some level of control over the information which appears on their profile and the publications that are listed in the repositories. While this gives us confidence in the accuracy of author-level profile information, there could be a selection bias in the publications that indeed appear to be linked to each authors. We address this concern with several robustness checks in our results section and in Appendix D.

For each source, we download data in the available format and apply in a translation and harmonization process in order to be able to append all different datasets into one. We then use the data we collect in order to build panel data, at the author-year level, that accounts for the academic performances

[7] Jenne et al. (2022) give the following reason for this "Sorosozás", which they translate as "Soros-bashing": capitalizing on existing antisemitic tropes to compete against the explicit far-right party Jobbik during the general elections campaign of 2018, including antisemitic rhetoric already directed at Soros from the 1990s emanating from Csurka's MDF against which Orbán pushed back at the time. Authors explain that this campaign was instrumental in helping Fidesz secure a third veto-proof majority in 2018. We further link this battle with the interdiction for all Hungarian universities (but applying only in practice to Eötvös Loránd University) to offer a master in gender studies, considered to be progressive propaganda pushed by Georges Soros.

[8] We do not consider Poland, due to the fact that the country was led by the right-wing populist Law and Justice party from 2015 to 2020, again with direct reference to Orbán's governance. We also do not consider Austria due to the relocation of the Central European University in Vienna that could create a bias in our estimation. In addition, we exclude Czechia and Slovakia due to incompatibility of the data with panel analysis at the other level.

[9] See `https://eurocris.org/` for more information.

of each researcher. In addition to publication-level data, CRIS databases collect extensive author-level information, including full names, fields of research, PhD completion year, and unique identifiers for each author. For authors for whom we have the information, we harmonise the field of research across CRIS data bases. We provide more details on the collection of the data, its harmonization and the construction of our final panel data set in Appendix B. This process results in a large sample of academics from the three countries: in its raw form, the dataset includes information on over 60,000 researchers in Hungary (since 1950), 40,000 in Slovenia, and 50,000 in Croatia.

To our knowledge, we are the first to use CRIS data sources in the innovation economics literature. This data offers broader, more accurate coverage of research activities in smaller countries, without introducing bias related to researchers' fields or productivity that could occur in international bibliometric data bases. We believe these specificities allow us to precisely identify the effect of political pressures on academic performance. Additionally, these national repositories are mainly used by researchers who are citizens of the countries in which they work. We argue that this nationality-based selection is not an issue for our analysis, as "national" researchers still make up the vast majority of academics in all the countries considered. Moreover, political pressure is likely to have a stronger impact on national researchers, while affecting foreign academics in Hungary differently.

3.2 International Bibliometric Data

The second major data source we use is OpenAlex, an open-access bibliometric database created from Microsoft Academic in 2021. It contains data on 247 million works, 90 million authors, and 60,000 concepts (Priem et al., 2022). We use OpenAlex data for publications from 1990 onward[10]. While Scopus and Web of Science have often been considered more detailed in terms of co-author networks, Microsoft Academic was regarded as one of the most comprehensive databases, particularly for publications not written in English (Visser et al., 2021).

Using both publication-level and author-level data from OpenAlex, and after correcting for some measurement errors[11], we construct a panel of authors active in Hungary and other Central European countries we take into account prior to 2010. This database allows us to create an author-year level panel that includes various measures of research quantity and quality for each author, as well as data on their co-author networks and academic affiliations. While national CRIS databases already provide extensive information on individual researchers' activities, OpenAlex is crucial for capturing *international* outcomes. Specifically, it enables us to track researchers' international mobility through their affiliation

[10]Note that OpenAlex has not been uniformly updated since 2021. We account for this limitation by restricting our analysis to the year 2020 .

[11]See Appendix B.2.

and their collaborations with foreign researchers who are not included in the national repositories data[12].

To conjointly use these data sources, we proceed as follows. First, we normalize publication titles[13] and collect common external identifiers (Digital Object Identifier (DOI) and Scopus identifiers) for publications across all databases, both national repositories and OpenAlex. We then merge the databases pairwise, matching publications based on identifiers, titles, and publication year, keeping only unique matches. These matched publications are then used to link author profiles across databases using author names. Additionally, we perform a second round of matching based on authors' names, affiliations, and research areas. We treat the national databases as the primary source of truth in this process, as they are curated directly by researchers and/or universities, whereas OpenAlex relies on a clustering algorithm to generate author profiles due to its larger scope. We provide further details on our data analysis and decisions regarding multi-profile authors in OpenAlex in Appendix B.2. Using this method, we match 52,172 authors profiles from the Hungarian CRIS to 57,536 OpenAlex profiles and 15,954 profiles from the Slovenian CRIS to 19,432 OpenAlex profiles. We are also able to match 360,155 publications from the Hungarian CRIS and 112,328 from the Slovenian one.

3.3 Measures of Academic Performance and Mobility

Quantity, Quality and Network

The main outcome of interest is the quantity of research that is produced. As baseline outcome of interest, we thus use the raw number of publications by given author in a given year. We then subdivide this number depending on the language of the publication. More precisely, we distinguish the number of publications in English from the number of publications in the "national language" of the country[14].
To account for the quality of research outputs, we use the rank of the journal in which an article is published. Specifically, we compute the average journal rank using the Scopus CiteScore methodology, which is based on citations in OpenAlex[15]. Journals are categorized into the following groups: bottom 50%, top 10%, top 5%, and top 1% cited journals. We then count the number of publications per author, per year, in each journal category. This method is particularly useful since citation counts per publication are not consistently available across all CRIS sources. Additionally, citations are only considered within

[12]In national repositories, names of researchers who do not work in the corresponding country often appear in the list of co-authors. They however do not have any unique author ID, and we thus use OpenAlex in order to be sure they are affiliated to an foreign-based institution.

[13]Specifically, we convert titles to lowercase ASCII characters, remove stop-words, and eliminate non-alphanumeric characters.

[14]For instance one publication in Hungarian for a Hungarian researcher is counted equivalently to one publication in Slovenian for a Slovenian researcher.

[15]Following James et al. (2018), we compute the journal rank by considering citations received by each journal relative to the total document counts over a four-year window in OpenAlex. This ranking is then merged with each publication in the CRIS data using the ISSN of the publication source. The rank is taken at the field level.

national repositories, which makes them primarily a proxy for the influence of research within the national research community, rather than an indicator of overall quality[16].

We further measure the impact of the political shock on researchers' collaboration networks. For this, we count the number of collaborations per researcher per year. We define a collaboration as co-authorship link between two researchers; multiple joint publications within the same year between the same authors are counted as a single collaboration during a given year. We also count the number of new collaborations, defined as first-time co-authorships. For these variables, in OpenAlex, we also distinguish collaborations *within the country* from co-authors that we identify as being from a different country, thus constructing a measure for international collaborations.

Research Direction

We also measure research direction by encoding the titles of researchers' articles published in Hungarian using a sentence transformer BERT model trained on a Hungarian corpus[17]. Similarly to the method of Arts et al. (2025) for all of OpenAlex, we then compute for each researcher present in the Hungarian CRIS the average cosine similarity between the titles of the articles published in Hungarian in each year and the titles of the articles published in Hungarian in the last year in which she published in Hungarian – we call this measure similarity with past research. We also compute the cosine similarity with the average embedding of political allies in the current year, either those who work in the same domain (Social Sciences, Health Sciences, etc.), field (Economics, Chemistry, etc.) or subfield (Applied Mathematics, Genetics, etc.) as defined in the OpenAlex classification.

Researchers Mobility

Finally, we measure researchers' mobility, considering only migration out of their *home* country, defined as the country in which the researcher is listed in the CRIS data or identified through their affiliation in OpenAlex. OpenAlex provides affiliation data for each year an author publishes, allowing us to track their mobility between affiliations. We create the following indicator variables: whether the author has published in their home country that year; whether the author has published outside their home country that year[18]; whether the author has not published in their home country for a specified number of years; and whether the author has stopped publishing in their home country, meaning they are no longer seen in the home country after that year. Additionally, we account for exits from research altogether, measured by whether a researcher leaves academia, based on the last year they published.

[16] Since this variable is available in the Hungarian national repositories, we mainly use it to assess academic influence among peers in Hungary.

[17] Specifically, danieleff/hubert-base-cc-sentence-transformer

[18] For both of these variables, the indicator takes the value 0 if the author has not published that year.

4 Empirical Strategy

4.1 Samples Selections

In order to fully take into account the scope of our data, and to identify political patterns, we consider several samples of the researchers population at hand. We describe here these different samples and the empirical strategy that we use to analyse them.

In this paper, we aim to address two distinct aspects related to the impact of political pressure on innovation and thus develop two distinct sets of samples. The first focuses on identifying the direct effects of political repression on researchers *within Hungary*. The second concerns the overall impact of illiberal policies on the state of academia in Hungary. In that case, our setting thus allows for comparisons between Hungarian researchers, exposed to the illiberal policies, and their counterparts in other Central Easter countries.

Hungarian Scholars and Political Targets

We first focus on differences between researchers within Hungary based on their perceived political alignment. From the raw sample of researchers in the Hungarian CRIS database, we again only keep those with at least one publication between 1990 and 2005, and whose entry year falls between 1990 and 2005. We subsequently construct 4 samples.

(i) Political Opponents Sample – This sample aims at comparing the trajectory of researchers that we could identify as "political opponents" of the regime. We compare the research performance of these researchers to those of comparable Hungarian researchers, using the same matching methodology as in the *cross-country sample in national databases*. The way we identify these researchers is based on two different definitions. First we consider all researchers that are affiliated with the Central European University prior to 2010, as members of the CEU have always been identified by conservatives politicians and members of the Fidesz as clear opponents to Viktor Orbán. Second, we establish a list of politically involved researchers that collaborate closely with Non-Governmental Organization that are particularly hostile to Viktor Orbán's policies. All researchers belonging to this political opponents groups have been matched to their identifiers in CRIS and OpenAlex data by hand. We provide more details about how these researchers are chosen and how they are matched in all data bases in Appendix B.3. The final matched sample consists of 228 treated authors and 7,934 control authors.

(ii)Political Loyalists Sample – This sample focuses on researchers who can be considered as politically supportive of the regime. We identify these individuals using the membership list of the Batthyány Society of Professors[19], a conservative academic circle closely aligned with Fidesz. We treat membership in this

[19]Founded in 1995 for professors "committed to traditional European social virtues". See here for more detail.

organization as indicative of loyalty to the government. Using the same matching procedure, we construct a sample of 72 treated researchers and 228 matched control authors.

(iii) Political Opponents in OpenAlex – Following a similar approach, we use the criteria from the *cross-country sample in OpenAlex* to build a sample of political opponents in OpenAlex. Based on the matched list of political opponents and using the same matching procedure applied in other OpenAlex samples, we obtain a sample of 154 treated authors and 3,226 control authors[20].

(iv) Non-aligned researchers sample. We also want to understand the effect of political pressures on researchers who are not targeted directly by the government as opponents, but who work on a subject that may not align with the politics of Fidesz. To do so, we focus on researchers publishing on two types of topics. First, those who work on gender-related issues, a subject that has been demonized in the press, and forcibly excluded from the programs of universities. Gender is also a subject which spans over more than one domain of science: gender and sexual differences have implications not only in social sciences, but also in health sciences and life sciences. Secondly, we define a set of authors working on *sensitive topics*, *ie* on topics that are often heavily politicized, dealing with issues that might go against the government-aligned speech on National History (Deportation, Antisemitism, Roma persecution) or on minorities (refugees, humanitarian crisis, etc.)[21] We use a list of keywords to understand whether the title of a publication refers to gender and sexual issues or a *sensitive topic*. We then use the number of such "gender" and "sensitive" publications in the first 5 years of publications to characterize a researcher's exposure to repression based on their work in this topic. We consider that researchers publishing more than 2 times in this topic in their first five years of activity are likely to be specialised and less able to divert their research towards other issues. We find in total 1,253 such researchers. We use the same matching procedures in order to build a control group of 6,396 Hungarian researchers.

In summary, our repeated matching procedure allows us to distinguish 4 non-overlapping groups within the full raw sample of Hungarian researchers: declared political opponents, conservative researchers aligned with the regime, "non-aligned" researchers working on "gender" and "sensitive" topics and researchers perceived as "neutral". We compare the research performance and career trajectories of political opponents and conservative researchers to their neutral counterparts, matched based on similar observable characteristics. Additionally, we ensure that control researchers are not co-authors of either political opponents or conservative researchers. To better account for international collaborations and mobility, we create an additional matched sample using OpenAlex data, as a counterpart of each of the 4 datasets. We build this sample using two criteria, to make use of resources from both data sources. The first method is similar to the one described above but within OpenAlex, while the second leverages our ability to match

[20] We do not construct an equivalent *Political Loyalists Sample* in OpenAlex due to the small size of this group, and because the vast majority of these researchers have remained in Hungary since 2010.

[21] Refer to Appendix C.2 for the full list.

researchers across databases. In the first step, we keep researcher profiles who have published at least two papers over the selection period (2000-2005), and who have more than a single year of activity in the database. We then assign them to a country over the period by computing the share of years during which they published in each country over the period. We then consider the maximum of these shares to be the primary country of affiliation of an author in this period. In other words, if an author has published in two separate years in Hungary and during another year in France, we consider this author to be primarily affiliated to Hungary. We keep all of these authors as a possible control group and then match in the exact same way as above.

Hungarian and Central-Eastern European Researchers

In section 6, we measure the global effect of illiberal policies on academia, performing cross-country author-level comparisons between Hungarian researchers and researchers based in Slovenia and Croatia- Such comparison between countries are not often performed[22]. We however argue that such comparison is in our case possible, thanks to the quality of the data we use, which allows us to build a precise matching procedure based on author-level characteristics. We start with the same restrictions as above, in all of CRIS data, which yields in total 31,149 authors. From this selection we derive 2 samples, to account for global researchers' performances and international collaborations.

Cross-country sample in national databases – To ensure comparability between the treated and control groups, we perform exact matching over the selection period, allowing for replacement, using the 31,000 authors we previously obtain. More precisely, we match on 3 variables: the *entry year* of the researcher –i.e. her first year of publication–, the main field of publications, quantile of total publications between 2000-2005, of publications in English between 2000-2005 and the average number of co-authors per year between 2000-2005. The finished sample comprises 5,347 authors in Hungary and 2,694 authors in Slovenia.

Cross-country sample in OpenAlex – We perform the same selection in OpenAlex as described above for the political samples in OpenAlex, keeping this time authors who are affiliated not only to Hungary but also Slovenia and Croatia. In this step, counting authors who may be equally affiliated to several countries over the period, we keep 55,221 authors in OpenAlex. We then keep all authors from the *cross-country sample in national databases* that have a plausible match based on our algorithm. This yields an additional sample of 20,120 authors. We then perform an exact matching based on the same method, on entry year and main field of activity. This yields a final sample of 9,274 Hungarian researchers, and 5,290 control researchers in OpenAlex.

[22]See for instance Kwiek (2016), for a cross-nations comparison of highly productive academics in Europe.

4.2 Comparing Academic Performance Across Researchers

For each sample we define, we estimate a difference-in-differences regression to compare the group of researchers of interest with the control group matched to them (political opponents with "neutral" researchers, or political allies with "neutral" researchers). We formally investigate the effect of illiberal policies on researchers' career trajectories by estimating the following equation:

$$Y_{it} = \sum_{t=2005}^{2020} \beta_t D_i \times Post_t + \alpha_i + \delta_t + \sum_{s=2005}^{2020} X_i \times \mathbb{1}_{\{t=s\}} + \epsilon_{it} \tag{1}$$

where Y_{it} is the outcome variable measuring academic performance for researcher i in year t. The treatment indicator D_i takes the value 1 if the researcher belongs to the group of interest and 0 if assigned to the matched control group, as defined in Section 4.1. The variable $Post_t$ is a binary indicator equal to 1 for years after 2010, the onset of illiberal policy implementation. The model includes individual fixed effects (α_i) and year fixed effects (δ_t). The term X_i represents a vector of time-invariant researcher characteristics, interacted with year fixed effects to control for their influence over time. In our baseline specification, X_i comprises only the field and the entry year of the author. We also consider extended specifications that include additional controls such as the author main main domain and the number of publications in the first two or five years of a researcher's career.

In all estimation tables, we further decompose the post-2010 effect of illiberal policies into distinct dummy variables corresponding to each mandate of Viktor Orbán (2010–2014, 2014–2018, 2018–2022, post-2022). This allows us to capture not only the overall impact of illiberal policies but also their potential intensification over time, which is likely to be gradual as the political pressures intensifies over the years and mandates.

5 How Do Political Pressures Affect Scientists?

We show in this section that trends in academic performance and migration of scientists differentially treated by the regime are consistent with both the literature on authoritarian regimes that designate internal minorities as enemies, and with the framework of "Exit, Voice, and Loyalty". We first focus on the effects on research quantity and quality of being part of politically relevant groups of scientists, opponents identified by the government and state-aligned media, conservative researchers aligned with the regime, or researchers working on gender-related topics, as it is a field that has been widely criticized and targeted by the government since 2010. We then analyse the mechanisms through which these effects occur, focusing on collaboration dynamics and direction of research.

5.1 The Effect of Not Being Aligned on Academic Productivity

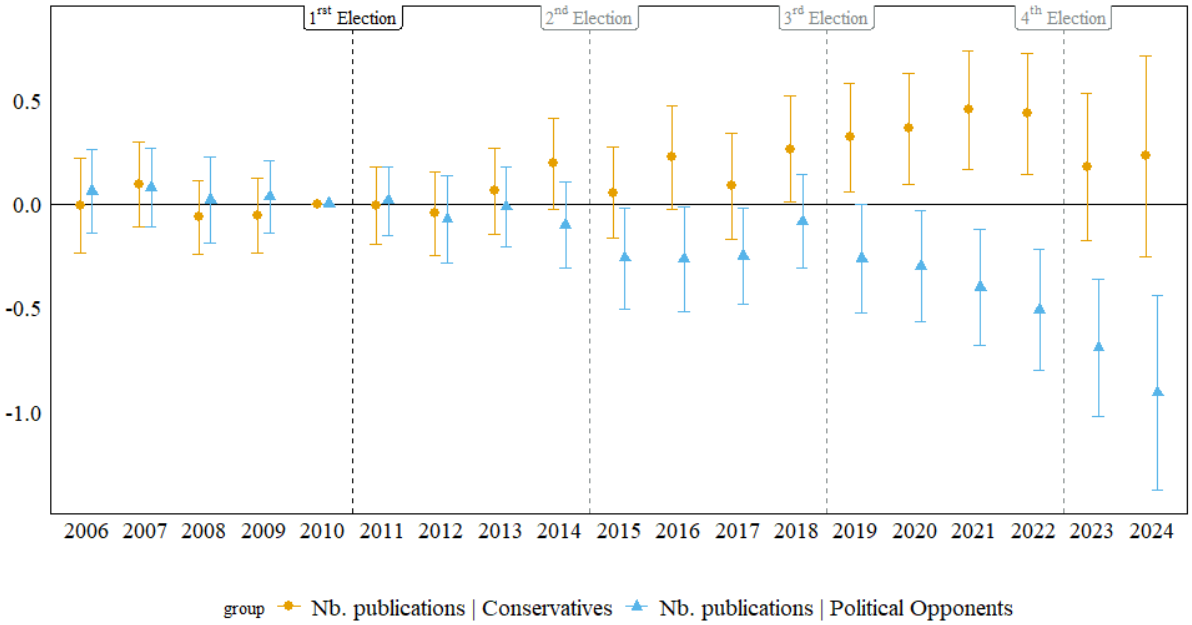
We begin by investigating the effect of illiberal policies on researchers who are directly targeted. To do so, we estimate equation 1 using the *political opponents sample in national databases*, where the treatment group corresponds to the list of political opponents as defined in Section 4.1. We contrast the results obtained on this sample to those obtained on the *political loyalists sample* using the same regression, changing the treatment to represent being a conservative researcher. This allows us to address the "Loyalty" strategy of the Hirschman framework.

Figure 1 shows a strong divergence in the trends of opponents and loyalists in terms of total publications. Compared to the "neutral" group, loyalists strongly increase their publications when opponents face a strong decrease as early as Orbán's second mandate. This is also true when splitting publications by language, as shown in Figure 2. Moreover, the effect on publications in Hungarian of being a loyalist is more positive than the effect on publications in English.

Table 1 summarises the difference in all remaining outcomes between researchers perceived as political opponents of Viktor Orbán and those that we do not classify politically. The magnitude of the effect that we measure is of higher intensity for the latest mandates, suggesting that the more intense the pressure, the stronger the impact on targeted researchers. Table 2 shows that this effect is much stronger for publications in high-quality sources than those published in the 50% least-cited journals, for which the effect in insignificant.

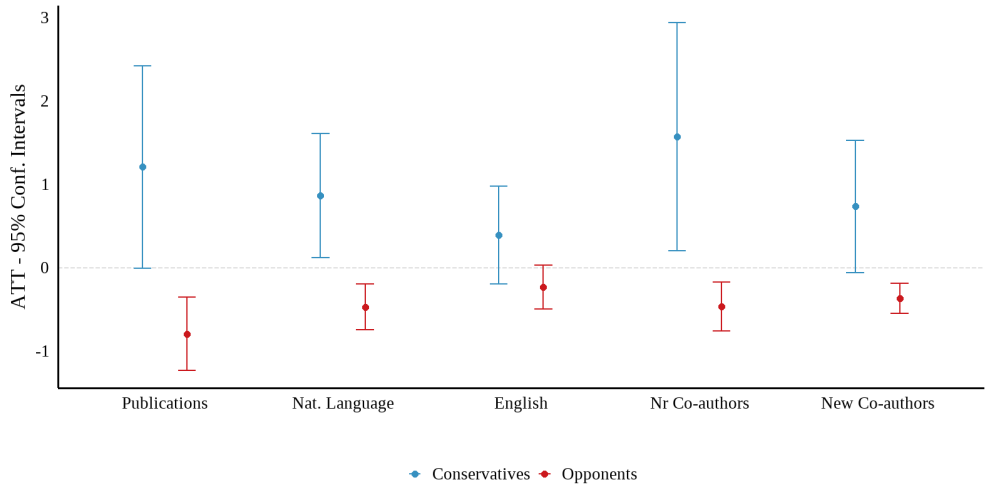
We summarize the results for loyalists in Table D.2.1. These researchers do not incur any loss in their total publications. Rather, being a loyalist yields a positive impact on research outcomes, especially in their number of publications. This does not prove that there is collusion with the government to promote their research themes: it is likely that their preferences are similar to those of the ministry in terms of research. In this case, it is therefore easier for them to get access to funding without any corruption. There is no significant effect on quality outcomes for these researchers.

Figure 1. Effect on Publications, by Political Alignment.



Notes: The graph above reports the coefficient in Fixed-Effects PPML regression on publications for each political group compared to Hungarian researchers that are not identified of being close to any organization targeted by the government nor to researchers explicitly supporting the government. Authors are matched using their number of publications over the period 2000-2005, entry year in academia and field of research. The dataset is winsorized at the top of the distribution at the 1 percent level for the outcome variable.

Figure 2. Effect on Hungarian Academics, by Political Alignment.



Notes: The graph above reports the ATT coefficients in Fixed-Effects PPML regressions for each political group compared to Hungarian researchers that are not identified of being close to any organization targeted by the government. Authors are matched using their number of publications over the period 2000-2005, entry year in academia and field of research. The dataset is winsorized at the top of the distribution at the 1 percent level for the outcome variable.

People who are in the political opponents sample have been directly targeted through laws and media

Table 1. Effect on Research Quantity and Network – Political Opponents Treatment

	Panel A: Research Quantity			*Panel B: Research Network*	
	publications	pub. nat. language	pub. in english	nr co-authors	nr new co-authors
	(1)	(2)	(3)	(4)	(5)
political opponent × post (1rst mandate)	-0.3673*	-0.2525**	-0.0549	-0.3165**	-0.2590***
	(0.1887)	(0.1256)	(0.1009)	(0.1279)	(0.0863)
political opponent × post (2nd mandate)	-0.9105***	-0.6275***	-0.2015	-0.4885***	-0.3757***
	(0.2292)	(0.1557)	(0.1244)	(0.1536)	(0.1033)
political opponent × post (3rd mandate)	-1.171***	-0.6671***	-0.3934***	-0.6879***	-0.5647***
	(0.2883)	(0.2006)	(0.1360)	(0.1677)	(0.0982)
political opponent × post (4th mandate)	-2.015***	-0.9859***	-0.7947***	-0.8249***	-0.6440***
	(0.3106)	(0.2218)	(0.1535)	(0.2148)	(0.1311)
Observations	123,048	123,048	123,048	123,048	123,048
R^2	0.595	0.577	0.549	0.508	0.329
Within R^2	0.001	0.001	0.001	0.000	0.001
Mean.Dep.Var.Pre	3.094	2.206	0.539	1.345	0.888
author fixed effects	✓	✓	✓	✓	✓
year × field fixed effects	✓	✓	✓	✓	✓
year × entry cohort fixed effects	✓	✓	✓	✓	✓

Note: Results are from Fixed-Effect PPML regressions on data from national repositories. The unit of observation is author by year and the sample period is 2005–2023. Panel A reports the effect on research quantity (total publications, publications in national language, and publications in English); Panel B reports the effect on the author's research network (number of co-authors and number of new co-authors). Each column reports the decomposition of the treatment effect by political mandate. Control variables account for trends for the matching cell over time. Standard errors are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

action, but this is not the case for the vast majority of researchers. Others may still feel that they are indirectly a target of the regime, particularly due to the topics they focus on. We propose here an attempt to capture how working in a field of research negatively perceived by the Fidesz governments could expose an author to a chilling effect. In order to analyse the latter, we turn to our *non-aligned researchers* sample.

We first conduct the following descriptive analysis in order to motivate our hypothesis. Figure 3 plots the number of new researchers each year who publish more than once in gender in their first five years of activity. This count starts declining from 2015 on, which suggests indeed that the topics related to "gender studies" that we identify as such become less attractive to young researchers over the period.

We then estimate equation 1 using as treatment whether the author works in gender related topics or sensitive topics. Table 3 summarises the results of this regression regarding author network and research quantity. We find that both for gender-related and sensitive topics, publications decrease. Within Hungary, researchers' political alignment and engagement with politically sensitive topics are increasingly associated with differences in academic productivity. Our quantitative findings—although limited to researchers working on gender-related or "sensitive" topics—are consistent with the qualitative evidence presented by Kováts and Rónay (2021), which documents how concerns about potential government targeting can have tangible effects on researchers' output.

Table 2. Effect on Research Quality – Political Opponents

	nr pub. top 1%		nr pub. top 5%		nr pub. bottom 50%	
	(1)	(2)	(3)	(4)	(5)	(6)
political opponent × post	-0.0100		-0.0699*		-0.0402	
	(0.0143)		(0.0384)		(0.0323)	
political opponent × post (1rst mandate)		-0.0053		-0.0717**		-0.0430
		(0.0144)		(0.0325)		(0.0328)
political opponent × post (2nd mandate)		-0.0086		-0.0710*		0.0017
		(0.0165)		(0.0424)		(0.0382)
political opponent × post (3rd mandate)		-0.0351**		-0.1188***		-0.0892**
		(0.0155)		(0.0460)		(0.0367)
political opponent × post (4th mandate)		-0.0598***		-0.1093**		-0.0712
		(0.0161)		(0.0482)		(0.0492)
Observations	123,048	123,048	123,048	123,048	123,048	123,048
R^2	0.343	0.343	0.567	0.567	0.422	0.422
Within R^2	0.000	0.001	0.000	0.001	0.000	0.000
Mean.Dep.Var.Pre	0.014	0.014	0.054	0.054	0.149	0.149
author fixed effects	✓	✓	✓	✓	✓	✓
year × field fixed effects	✓	✓	✓	✓	✓	✓
year × entry cohort fixed effects	✓	✓	✓	✓	✓	✓

Note: results are from Fixed-Effect regression, for each outcome, on data from Hungarian national repositories. The unit of observation is author by year and the sample period is from 2005-2023. The dependent variable is the number of publications in the top 1% and 5% most cited journals and the 50% least cited journals (resp. columns (1), (2), (3)), and the share of the latter over the total number of publications (column (4)). Standard errors (SE) are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

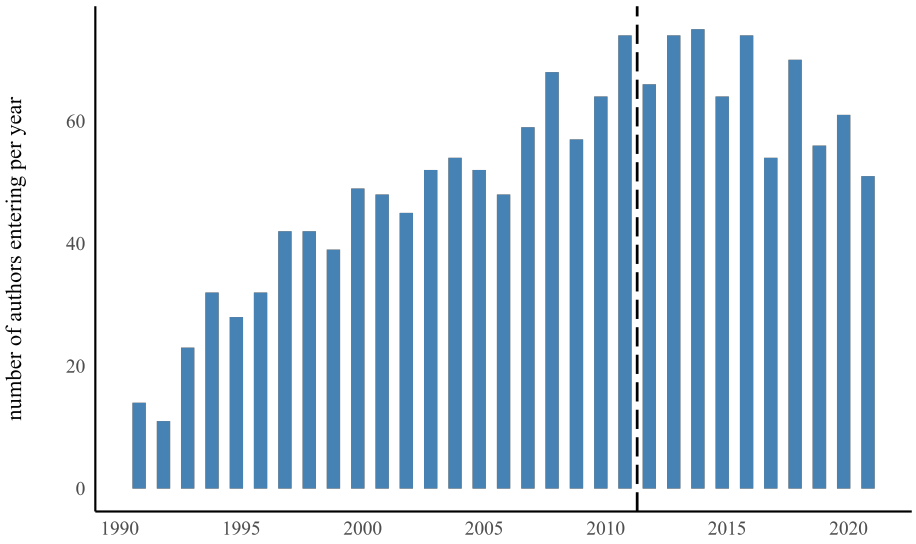
Table 3. Effect on Research Quantity, Network and Content – Gender and Sensitive Topics Treatments

	Panel A: Research Quantity and Network						*Panel B: Research Content*			
	Nb. publications		Nb. new collaborations		Nb. co-authors		Sim. Conserv.	sim (2000-2009)	sim (2000-2009)	Sim. Conserv.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
gender × post	-0.2956*		-0.3466***		-0.6793***		0.0023	0.0064*		
	(0.1667)		(0.1193)		(0.2444)		(0.0047)	(0.0034)		
sensitive × post		-0.5368***		-0.4018***		-0.5271***			0.0055***	-0.0063***
		(0.0629)		(0.0454)		(0.0866)			(0.0016)	(0.0023)
Observations	98,929	260,065	98,929	260,065	98,929	260,065	16,989	37,629	84,497	36,117
R^2	0.629	0.592	0.484	0.422	0.680	0.614	0.569	0.515	0.505	0.556
Within R^2	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000
Pre-period mean	6.063	4.480	3.143	2.337	6.090	4.349	0.811	0.896	0.885	0.797
Author FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year-Field FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year-Entry year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: Results are from Fixed-Effect OLS regressions. The unit of observation is author by year. Panel A reports effects on research quantity and network outcomes (number of publications, new collaborations, and co-authors); Panel B reports effects on research content similarity outcomes. Odd columns report the effect for the gender treatment; even columns report the effect for the sensitive topics treatment. Control variables account for trends for the matching cell over time. Standard errors are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

For all the regressions presented in this paper, we vary the variables on which we match the control to the treated group. Our preferred matching equation rely on variables that captures essential characteristics of researchers when it comes to comparing their trajectories both across-country and within

Figure 3. Number of entering authors working on gender topics.



Notes: The graph above shows the number of new authors working on gender-related topics between 1990 and 2020. The entering year is defined as the year of an author's first publication in our database. We use a five-year forward window to identify only the first publications of each author's career. We define new authors working on gender topics as those with more than one publication on gender-related topics within this five-year period. Gender publications are defined using the method detailed in Appendix C.2.

Hungary. However, we also create alternative samples, using the same exact matching procedure but relaxing it by dropping some of the variables used to perform it. Doing so, we logically increase the size of both the control and treatment groups. We find that our results are robust to this exercise, and that increased size sample show similar effects of illiberal policies on academia. We perform a series of robustness checks regarding the results about gender studies. First, we chose more restrictive conditions to select authors working in gender topics and find similar results. Second, we replicate these results in OpenAlex, in which we find that the overall number of publications and average quality decline as well, while there are no effects on migration.

As mentioned in Section 3, we define an extensive set of outcomes variables, that enable to measure the impact on the quantity and quality of research outcomes, but also on the migration behaviour and the number of collaborations of exposed researchers. Results are also robust to different winsorization thresholds on the outcomes variables ($0.1\%, 1\%$ and 5%), showing that our results are not driven by extreme values in the distribution of outcomes which is a usual concern when using publication data.

5.2 Mechanisms: Are Researchers Really Silenced?

We now decompose the potential mechanisms through which the aforementioned positive and negative effects of political alignment take place.

5.2.1 Research Network Contraction and Exit

We first focus on the size of an individual's research network. Table 1 shows a similar pattern to the one regarding the quantity of research. Targeted researchers have on average one fewer co-author every 2 years compared to their Hungarian "neutral" counterpart. We find similar effects when looking at the number of new collaborations, which also intensify through the cycle of re-elections of Viktor Orbán. Conversely, the network within Hungary of loyalists appear to increase. Due to the fact that in these regressions, we only compute the number of coauthors who are also in the national database, this expansion in the Hungarian network also explains why publications in Hungarian increase more rapidly than those in English.

We further this analysis by estimating equation 1 on the *political opponents sample in OpenAlex*. Some of the targeted researchers are less likely to have an affiliation in Hungary, even before the departure of the CEU, although due to its magnitude, the effect of this specific shock can very clearly be seen in the data. We summarise migration-related results in Table 4: while repression does not lead researchers to stop voicing, it does cause a non-negligible part of them to exit – they are about 10 pp more likely to have left Hungary for four years over the period, including above 9pp prior to the relocation of the CEU.

Table 4. Effect on Migration Outcomes – Political Opponents Treatment

	has an affiliation in own country		has an affiliation in other country		for over 4 years		nr of international collaborations	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pol. opponent × post	-0.0461		0.0426		0.1070***		0.1520***	
	(0.0451)		(0.0532)		(0.0233)		(0.0478)	
Pol. opponent × post (1rst mandate)		0.1134***		-0.0657		0.0760***		0.0602
		(0.0411)		(0.0497)		(0.0222)		(0.0440)
Pol. opponent × post (2nd mandate)		0.0088		-0.0469		0.0995***		0.1566**
		(0.0532)		(0.0623)		(0.0294)		(0.0616)
Pol. opponent × post (3rd mandate)		-0.1913***		0.1249		0.1826***		0.1339*
		(0.0709)		(0.0773)		(0.0367)		(0.0704)
Observations	6,734	6,103	6,734	6,103	26,131	24,191	26,131	24,191
R^2	0.710	0.725	0.696	0.711	0.646	0.660	0.227	0.216
Within R^2	0.001	0.015	0.000	0.004	0.017	0.019	0.001	0.001
Mean.Dep.Var.Pre	0.866	0.866	0.263	0.263	0.018	0.018	0.084	0.084
final_id fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
year × entry cohort fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
year × field fixed effects	✓	✓	✓	✓	✓	✓	✓	✓

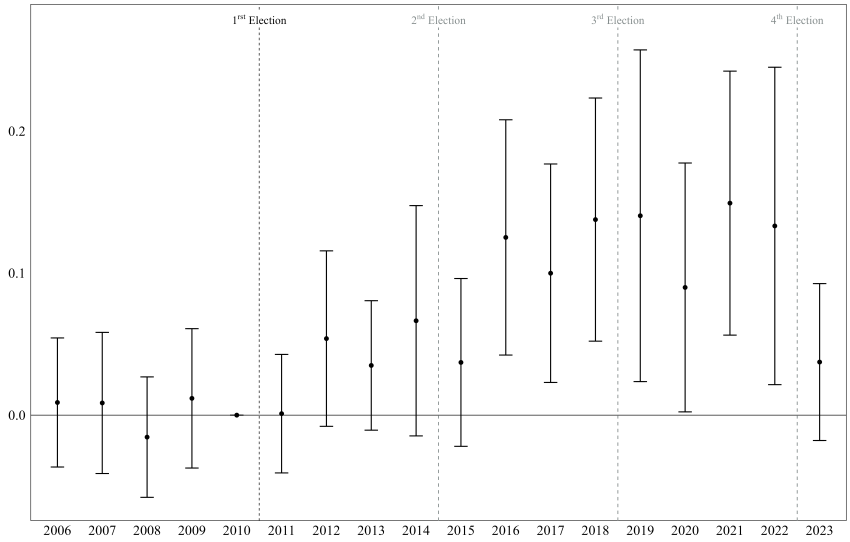
Note: results are from Fixed-Effect OLS regression, for each outcome, on data from OpenAlex. The unit of observation is author by year and the sample period is from 2006-2020. Control variables account for trends for the matching cell over time. Standard errors (SE) are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

5.2.2 Research Direction, Self-Censorship and Voicing Opposition

While we find that researchers who are politically targeted experience a decline in academic performance, our results also indicate that political pressure is relatively ineffective at fully silencing them. Rather than

remaining silent and complying with government demands,[23] explicitly targeted researchers increasingly publish on topics that explicitly signal criticism of Viktor Orbán. In particular, we focus publications which use the lexicon of "rule of law"[24], which has been among the main arguments of Central European University members and the European commission against the "Lex CEU". Researchers who are identified as political opponents publish more of them as early as 2011, as shown in Figure 4. Notably, this trend does not diminish after 2018, suggesting that these researchers have largely chosen to "voice" their dissent rather than adopt a strategy of "loyalty". Additionally, we show in Table D.2.2 that this behaviour is not only driven by neither CEU members nor by researchers affiliated with NGOs, but that both show an increase in the number of publications relative to the current democratic backsliding. In addition to this, we show in Table 5 that on average, the similarity of new articles to published articles decreases for political opponents compared to neutral researchers. Our results are reinforced by the fact that loyalists, in general in line with policies that have been implemented after 2010, do not appear to "voice" like researchers we identified are political opponents (column (7)).

Figure 4. Effect on the Number of *Rule of Law* Publications.



Notes: The graph above reports Fixed-Effect OLS regression estimates for the difference in the total number of publications by year for researchers we identify as political opponents, compared to other Hungarian researchers for the period 2006-2023. Authors are matched using their number of publications over the period 2000-2005, their main field of publication and their year of entry in academia.

The qualitative results of Kováts and Rónay (2021) suggest that academics may feel the need to self-censor in their research not to attract negative attention. While this is hard to measure, we attempt

[23]For instance, the strategy adopted by the Central European University administration—prior to relocating its main campus from Budapest—was to comply with all legal requirements until doing so became unfeasible.

[24]We detail in Appendix C.2.2 how we define such variables using the vocabulary use in the publication title.

Table 5. Effect on Research Direction – Political Opponents Treatment

	Similarity with previous research		Similarity with average "loyal" researcher					
			Same domain		Same field		Same subfield	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
political opponent × post	-0.0238***		-0.0148**		-0.0183**		-0.0199***	
	(0.0071)		(0.0067)		(0.0074)		(0.0059)	
political opponent × post (1rst mandate)		-0.0107		-0.0045		-0.0040		-0.0054
		(0.0080)		(0.0064)		(0.0060)		(0.0059)
political opponent × post (2nd mandate)		-0.0277***		-0.0168***		-0.0221***		-0.0230***
		(0.0090)		(0.0065)		(0.0064)		(0.0062)
political opponent × post (3rd mandate)		-0.0341***		-0.0276***		-0.0266***		-0.0251***
		(0.0107)		(0.0100)		(0.0095)		(0.0093)
political opponent × post (4th mandate)		-0.0696***		-0.0282**		-0.0362***		-0.0408***
		(0.0158)		(0.0133)		(0.0120)		(0.0117)
Observations	67,176	67,176	28,721	29,120	28,620	29,120	29,120	29,120
R^2	0.465	0.465	0.525	0.525	0.606	0.604	0.573	0.574
Within R^2	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.001
Mean.Dep.Var.Pre	0.760	0.760	0.797	0.797	0.786	0.786	0.763	0.763
author fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
year × field fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
year × entry cohort fixed effects	✓	✓	✓	✓	✓	✓	✓	✓

Note: results are from Fixed-Effect OLS regression, for each outcome, on data from OpenAlex. The unit of observation is author by year and the sample period is from 2006-2020. Control variables account for trends for the matching cell over time. Standard errors (SE) are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

to do so looking at the textual content of research papers. For explicitly targeted researchers, average similarity to political allies of Fidesz decreases compared to neutral researchers, whether we look at the level of the domain, the field or the subfield: they do not appear to change research direction in order to self-censor.

We now turn again to researchers working in targeted fields. Panel B of Table 3 shows the effect of working on such topics prior to the shock on similarity to past research, which is positive and significant for both groups, and on similarity with loyalists working in the same field, which is only significant and negative for researchers working on non-gender sensitive subjects. Our interpretation is that there is no self-censorship for those researchers, possibly for political reasons. An alternative explanation, consistent with negative effects on output, is that these researchers highly specialized in these fields and may not be able or willing to redirect their research agendas. This in turn makes them more vulnerable to marginalization. Although scholars working on gender-related topics are not formally excluded from academic activity, the need to adjust research agendas appears to impose significant constraints on their productivity.

5.2.3 Evidence on the Effect of Funding

An obvious mechanism for political repression would be to diminish the budget allocated to opponents, at the institutional or individual level. As we have no access to funding data at either level, we cannot identify causally whether the negative effects described above occur through this channel. We however

find evidence that funding cannot be the cause of the entire effect. Our first evidence is the fact that the majority of the opponents in our sample are members of the CEU throughout the period. Given that the CEU is fully private, the government could not have been able to affect their funding. We then turn our attention to external grants. While we cannot observe the state funding to a given institution, we can observe whether an individual researcher has received a grant from the ERC. In our sample of political opponents, this is the case for only 6 researchers, so sample size prevents us from deriving any causal results. subsection D.1 presents descriptive statistics on the number of ERC recipients in the period and unconditional trends.

Our sample size of ERC recipients is very small (83 researchers). Among political opponents, there are only 6. In order to accurately represent trends in their publications, we perform a minimal matching algorithm, on 5 years window of author entry and ERC status only, to the entire sample of political opponents. The final sample contains 269 treated authors and 44,916 control authors, 51 of which are ERC recipients. We then estimate a minimal triple differences-in-differences with fixed effects controlling for the domain :

$$y_{it} = \beta_1 \times \text{opponent}_i \times \text{ERC}_i \times \text{post}_t + \beta_2 \times \text{ERC}_i \times \text{post}_t + \beta_3 \times \text{ERC}_i \times \text{opponent}_i + \\ \beta_4 \times \text{opponent}_i \times \text{post}_t + \beta_5 \times \text{ERC}_i \times \text{post}_t + \beta_6 \times \text{opponent}_i + \beta_7 \text{post}_t + \gamma \times \text{domain}_i + \epsilon_{it} \quad (2)$$

In which ERC_i is an indicator taking value 1 when the researcher has received an ERC, opponent_i takes value 1 when we identified the researcher as a political opponent, and post_t takes value 1 when the year is above 2010. We also estimate the same difference in differences splitting the four mandates.

Table 6 presents the results. While we cannot interpret them causally, we believe that they provide circumstantial evidence that even for researchers who are widely recognised to the point that they receive an ERC, this funding has not been enough to offset the effect of illiberalism. Only the total number of publications in English and citations of ERC recipients identified as political opponents still increases after the shock, but with a very sizeable negative effect compared to those of control ERC recipients. Our interpretation is that these researchers who depend on other sources of funding than the government still suffer heavily and increasingly from the political climate. Funding itself, while probably playing a role for the majority of researchers, is not the only mechanism through which illiberalism expresses itself.

Table 6. Trends in Outcomes for Political Opponents, by ERC Recipient status

	publications		pub. in English		pub. nat. language		citations		nr pub. top 5%	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
political opponent × ERC recipient × post	-4.375**		-2.497**		-1.319***		-125.0***		-1.116***	
	(1.633)		(1.161)		(0.3607)		(28.58)		(0.2531)	
ERC recipient × post	3.887***		3.797***		-0.3216		175.8***		1.781***	
	(0.9618)		(0.6802)		(0.2750)		(25.92)		(0.2745)	
political opponent × post	-0.8325***		-0.2868		-0.4379***		-18.20***		-0.0646	
	(0.2510)		(0.1632)		(0.1166)		(2.962)		(0.0686)	
political opponent × ERC recipient × post (1rst mandate)		-4.331**		-2.123		-1.772***		-188.9**		-1.003***
		(1.973)		(1.411)		(0.2817)		(65.41)		(0.1155)
ERC recipient × post (1rst mandate)		3.406***		3.493***		-0.4356		266.3***		1.765***
		(1.087)		(0.7618)		(0.2479)		(50.60)		(0.1518)
political opponent × post (1rst mandate)		-0.0230		-0.0369		0.0316		-7.861***		-0.0556
		(0.1753)		(0.1023)		(0.0958)		(2.636)		(0.0585)
political opponent × ERC recipient × post (2nd mandate)		-4.435**		-2.480*		-1.280**		-86.92***		-0.6973
		(1.850)		(1.248)		(0.4522)		(11.85)		(0.4460)
ERC recipient × post (2nd mandate)		4.382***		4.145***		-0.2840		160.6***		1.769***
		(0.8350)		(0.6668)		(0.2375)		(12.19)		(0.3480)
political opponent × post (2nd mandate)		-0.8232***		-0.2243		-0.5049***		-17.41***		-0.0793
		(0.2214)		(0.1587)		(0.0952)		(3.334)		(0.0691)
political opponent × ERC recipient × post (3rd mandate)		-4.434***		-2.963***		-0.8982*		-94.21***		-1.717***
		(1.331)		(0.9716)		(0.4276)		(16.51)		(0.3809)
ERC recipient × post (3rd mandate)		4.173***		4.047***		-0.2758		103.8***		1.937***
		(0.8528)		(0.6240)		(0.3586)		(17.61)		(0.3548)
political opponent × post (3rd mandate)		-1.508***		-0.5000**		-0.8233***		-25.18***		-0.1201
		(0.3241)		(0.1959)		(0.1634)		(4.095)		(0.0779)
political opponent × ERC recipient × post (4th mandate)		-4.703***		-3.696***		-0.4959		-36.20		-1.916***
		(1.003)		(0.7075)		(0.3239)		(26.91)		(0.4715)
ERC recipient × post (4th mandate)		4.078***		3.788***		-0.1570		32.78		1.884***
		(1.120)		(0.6626)		(0.3069)		(23.66)		(0.5244)
political opponent × post (4th mandate)		-2.681***		-0.9372***		-1.452***		-32.91***		-0.1182
		(0.3060)		(0.1726)		(0.1612)		(4.765)		(0.0775)
Observations	732,434	732,434	732,434	732,434	732,434	732,434	732,434	732,434	732,434	732,434
R^2	0.017	0.017	0.085	0.085	0.025	0.025	0.007	0.007	0.016	0.016
Within R^2	0.001	0.001	0.003	0.003	0.000	0.000	0.001	0.001	0.001	0.001
Mean.Dep.Var.Pre	3.450	3.450	1.409	1.409	1.830	1.830	31.355	31.355	0.321	0.321
domain fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
post fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
political opponent fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: results are from Fixed-Effect OLS regression, for each outcome, on data from MTMT. The unit of observation is author by year and the sample period is from 2005-2023. Treated authors are authors from our sample of political opponents, split by ERC recipient status. Control authors are neutral Hungarian researchers matched to the treated, split by ERC recipient status.*** p<0.01, ** p<0.05, * p<0.1.

6 What Is the Global Effect of Illiberal Policies?

In this section, we describe the overall trends in Hungarian academia since Viktor Orbán's election in 2010. While the previous section focuses on estimate equation 1 to compare the career trajectories of researchers exposed to illiberal policies with those of researchers not exposed, results presented in this one allow us to characterize the global effect of illiberal policies by comparing Hungarian researchers versus their counterparts in neighbouring countries.

6.1 Research Productivity, Research Quality

We first focus on the *cross-country sample in national databases* to measure the impact of the shock on individual research productivity and quality. We show that while research productivity increases by national measures, its presence in international data as well as its quality decline. Figure 5 and Table 7 that compared to researchers in foreign countries, the number of publications per year by Hungarian researchers increases over the period. We measure an effect of around 0.15 per year on average as soon as 2013 and it is clear that researchers appear to have been incentivized to produce a higher number of publications. However, Figure 5 also shows that this increase can almost fully be accounted for by the number of publications in the researcher's "national language" (in our case Hungarian), while if anything, the effect on the number of publication in English is negatively impacted – although the coefficient is not significant. This effect is consistent with the policies that have been implemented in order to incentivise researchers to publish in national journals and furthermore in Hungarian, and those that we found on loyalists in the section above.

While the quantity of publications does not decrease, we show that the quality of the publications of Hungarian researchers appears to decline. Table 7 shows our results on outcomes linked to quality of research. In particular, the number of papers published in the top 1% most cited sources decreases. This result can be extended to the number of publications in the top 5% of most cited journals and to the number of publications in top 10% cited journals. Again, the effect that we measure is higher for the latest years: Hungarian researchers already produce 25.9% fewer publications in top 10% journals per year relative to the control group during the first mandate (column 8), but almost 60% fewer during the third mandate. While most of the journals at the top of the citations distribution tend to be in the English language, the effect that we measure on the quality of Hungarian researchers cannot be imputed to a decrease in English-language publications in the national repositories we use, as these do not decline. The change of trend in the composition of rank of sources in publications increases after 2014 onwards, which suggests that this change is related to the introduction of the chancellor system, and increases after 2018 and the start of "regime change" of academia, as it can be seen Figure 5. Consistently, we find that the number of publications in the 50% least cited sources increases and follows a dynamic similar to the

number of top publications with again an intensification of the effect through the years.
Again, the production of lower quality research could be caused by lower funding. In the context of the European Sovereign debt crisis, the Hungarian government has been undertaking efforts in order to lower the level of public expenditure in addition to organizational reforms. While it is probable that research has suffered from austerity due to decreasing funding, due to lack of access to individual funding data, we cannot find any causal result on that front. However, we believe that there is no evidence that researchers have overall been disproportionately affected by cuts in spending at the aggregate level compared to their counterparts in other Central European countries.

We conclude from these results that while total productivity seems to have been affected positively for Hungarian researchers, this happened mostly in their own language and to the detriment of their international stature. They are less likely after 2010 than comparable foreign researchers to publish in the top journals in their field.

Table 7. Effect on Research Quantity, Network and Research Quality

	Panel A: Research Quantity and Network					*Panel B: Research Quality*			
	Pub. (1)	Pub. En. (2)	Pub. nat. lang. (3)	Coauthors (4)	New Coauth. (5)	Pub. Top-1 (6)	Pub. Top-5 (7)	Pub. Top-10 (8)	Pub. Bottom-50 (9)
hungary × post (1rst mandate)	0.1045***	-0.0742**	0.1648***	0.1835***	0.1841***	-0.4584**	-0.3714***	-0.2884***	0.1654***
	(0.0219)	(0.0363)	(0.0250)	(0.0308)	(0.0324)	(0.2046)	(0.1122)	(0.0912)	(0.0386)
hungary × post (2nd mandate)	0.1641***	-0.0186	0.2491***	0.3658***	0.3722***	-1.5112***	-1.0188***	-0.8104***	0.3393***
	(0.0270)	(0.0417)	(0.0304)	(0.0366)	(0.0377)	(0.3094)	(0.1899)	(0.1584)	(0.0539)
hungary × post (3rd mandate)	0.1092***	-0.0210	0.2455***	0.4412***	0.4898***	-1.3312***	-1.2065***	-0.9020***	0.3866***
	(0.0297)	(0.0442)	(0.0333)	(0.0403)	(0.0412)	(0.2870)	(0.1763)	(0.1535)	(0.0589)
hungary × post (4th mandate)	0.2026***	0.0991*	0.2948***	0.6001***	0.6952***	-1.0820***	-0.6163***	-0.5770***	0.5854***
	(0.0379)	(0.0551)	(0.0439)	(0.0501)	(0.0586)	(0.3515)	(0.2267)	(0.1964)	(0.0735)
Observations	225,469	159,735	189,190	216,516	209,502	16,176	38,986	54,245	171,885
Adj. Pseudo R^2									
Squared Cor.									
Pre-period mean	0.684	0.146	0.457	0.538	0.342	0.016	0.039	0.056	0.246
Author FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year-Field FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year-Entry year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: Results are from Fixed-Effect Poisson regressions on data from CRIS-national repositories. The unit of observation is author by year and the sample period is 2005–2023. Treated authors are from Hungary; control authors are Slovenian qnd Croatian researchers matched to the treated. Panel A reports the effect on research network outcomes (number of co-authors and number of new co-authors); Panel B reports the effect on research quality outcomes (number of publications in the top 1% and top 5% most cited journals, and publications in the bottom 50% least cited journals).Each column reports the decomposition of the treatment effect by political mandate. Control variables account for trends for field and entry year in academia FE. Standard errors are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

6.2 Decoupling of Collaborations: National and International Network

We now focus on the effect of illiberal policies on researcher network. Table 7 shows that researchers affected by illiberal policies on average publish more frequently with other researchers in their own country compared to control researchers after 2010. Coefficients reported in this table shows results obtained with CRIS data, thus representing only the effect on the *national network* of Hungarian researchers. This is

both true when looking at the total number of co-authors and at the number of new collaborations. On average, after 2010, a Hungarian researcher has 3 more co-authors each 5 years compared to a Slovenian author. This effect is quite important and represent almost a 50% increase for both total and new collaborations during the third mandate's period. Since the number of collaborations that we capture here are by definition only collaborations with other "national" authors, we believe that this result constitutes further evidence of increased isolation of Hungarian science.

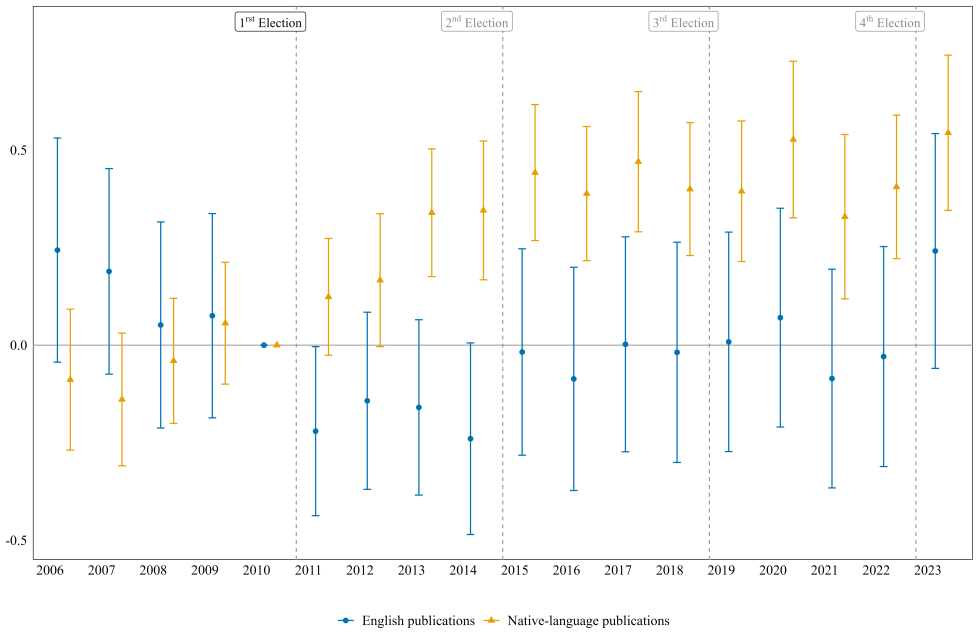
We further consolidate this hypothesis by using the variables related to the number of international publications and collaborations of our *cross-country sample in OpenAlex*. Our finding about network contraction at the international level is thus reinforced by the result showed in Table 8. The number of international publications – publications with authors outside of their own country– diminishes for Hungarian authors compared to control authors. The effect estimated follows a similar pattern to those measure for both research quantity and quality, that is to say an intensification of the effect through Viktor Orbán's mandates. We believe that this effect is consistent with the effect we measure using national repositories and reflects a decoupling of collaboration between "national" collaborations and "international" collaborations.

6.3 Exit Through International Mobility

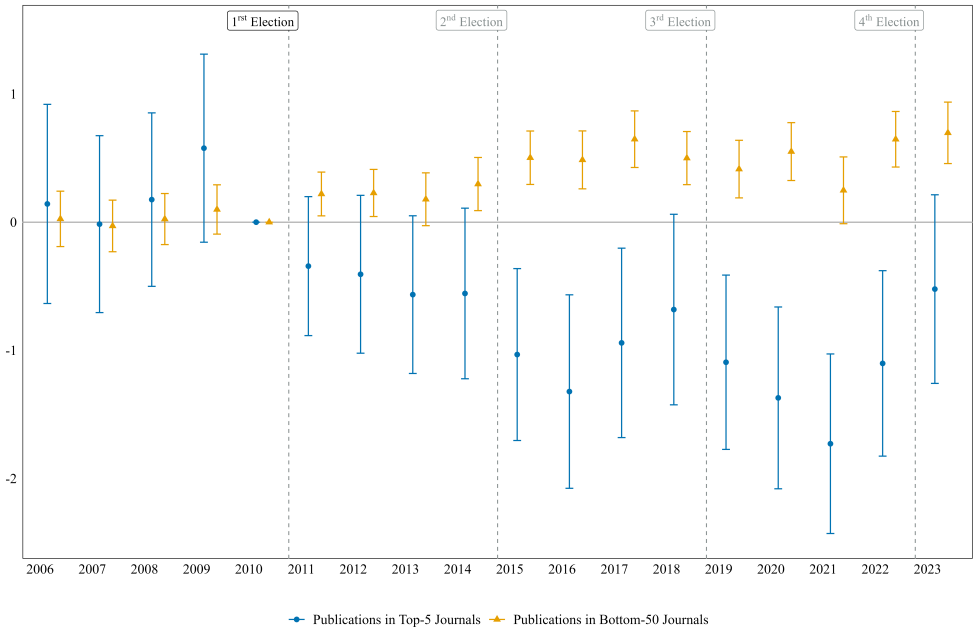
We also examine *exit* strategies of researchers compared to their control counterparts. We thus use the information available in the *cross-country sample in OpenAlex* to analyse the patterns of migration of researchers and find that researchers appear to emigrate more compared to foreign counterparts. First, we find no effect on the instantaneous probability of publishing with another affiliation outside of the home country. However, Figure D.3.2 shows that the probability of not publishing for four consecutive years in Hungary increased for Hungarian authors compared to the same probability in Slovenia for Slovenian authors. While this probability is raised only by 1pp, which is not very high in absolute value, it still represents 25% of the average of the variable before the shock (2006-2010). This is also the case for the probability of not publishing for three and two years in the home country, as shown in Table 8. Overall, although the in absolute value the effect on immigration is moderate, it is still non-negligible relative to the baseline variable.

Finally, we look at the probability of *exiting* not only through having another affiliation outside the country but through leaving academia. We measure this phenomenon with a variable that is equal to 1 the year the researcher exit academia *ie* does not have any additional publiaction after this date. The estimate indicates reported in Table 8 that Hungarian researchers are 0.77 percentage points more likely to exit per year relative to the control group after 2010. This rate is on average of 2.68% in Hungary and of 2.82% in control countries. This effect thus corresponds to a 29% increase in the probability of exiting. The disaggregated results per mandate reveal that this effect intensifies over time: by the

Figure 5. Effect on the Quantity and Quality of Research



(a) Effect on Publications, by Language



(b) Effect on Publications, by Journal Rank

Notes: The figure reports estimates from Fixed-Effects PPML regressions using data from CRIS national repositories. The outcomes are (i) the number of publications by language and (ii) the number of publications by journal rank over the period 2006–2023. Treated authors are researchers based in Hungary, while the control group consists of matched researchers from Slovenia and Croatia. The outcome variable is winsorized at the top 1 percent of its distribution to limit the influence of extreme values.

third electoral mandate, the treatment effect reaches 1.24 percentage points, equivalent to a 46% increase relative to baseline for the period 2019-2022, which is again consistent with a increasing effect that is strongly correlated with the intensity of the political pressure.

Table 8. Effect on International Collaboration and Migration

	Affil. other country		Id. four years		Intl. Collaborations		Exit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
hungary × post	-0.0006		0.0134***		-0.0592***		0.0077***	
	(0.0035)		(0.0036)		(0.0221)		(0.0021)	
hungary × post (1rst mandate)		0.0040		0.0108***		-0.0156		0.0034
		(0.0036)		(0.0033)		(0.0178)		(0.0025)
hungary × post (2nd mandate)		-0.0014		0.0156***		-0.0810***		0.0066*
		(0.0044)		(0.0045)		(0.0275)		(0.0026)
hungary × post (3rd mandate)		-0.0047		0.0162***		-0.0791**		0.0124***
		(0.0060)		(0.0050)		(0.0317)		(0.0031)
hungary × post (4th mandate)								0.0098
								(0.0075)
Observations	203,938	203,938	203,938	203,938	203,938	203,938	114,354	114,354
R^2	0.467	0.467	0.698	0.698	0.533	0.533	—	—
Within R^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mean Dep. Var. (Pre)	0.087	0.087	0.052	0.052	0.190	0.190	0.027	0.027
Author fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
year × entry cohort fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
year × field fixed effects	✓	✓	✓	✓	✓	✓	✓	✓

Note: results are from Fixed-Effect OLS regression, for each outcome, on data from OpenAlex. The unit of observation is author by year and the sample period is from 2006-2019. Treated authors are authors from Hungary. Control authors are Slovenian researchers matched to the treated. The dependent variable is an indicator variable taking the value 1 if the author publishes with an affiliation outside of Hungary for the treated and Slovenia for the control after that date for a given year (column (1)) and for four consecutive years (resp. columns (2), (3), (4)), and another indicator variable taking the value 1 if the author is never seen publishing with an affiliation in Hungary for the treated and Slovenia for the control after that date (column (5)). Control variables account for trends for the matching cell over time.. Control variables account for trends for the matching cell over time. Standard errors (SE) are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

6.4 Aggregate Losses of Polical Pressures

Beyond the estimation of micro-effects at the individual level, we want to assess the cumulated macro effect of illiberal policies on the aggregate output of research and the stock of researchers over the entire period. In this exercise, because we estimated these effects only on researchers entering after 1989 and before 2010, we focus on this population of researchers and apply our estimates to their entire numbers. Table 9 reports our calculations.

For each variable, in column 2, we report the coefficients estimated in the individual-level of Equation 1 in our cross-country sample. Because most of them are obtained through PPML regression, we also report the corresponding effect in percentage in the third column. We then apply this percentage effect to the pre-shock average, discarding the potential growth unrelated to policy change in academic productivity in

the later period. We then multiply this per-person effect by the number of active researchers during the period and the number of years after the shock, reported in the Global Effect column (GE). However, this calculation does not take into account the fact that a share of the considered researchers exits from our database (either because they no longer publish, or because they are no longer in Hungary). This effect therefore no longer applies to them. We present the same calculations, taking into account exits year by year in column 6, GE (corrected). Finally, the last column shows the ratio of column 5 to the total outcome over the entire period. The rise in Hungarian-language publications estimated at the individual level translates to between 35000 and 50500. The rise in publications in the 50% least-cited sources in OpenAlex reaches about two fifths of that, between 15000 and 22000. While the total number of lost publications in the top 1% and 10% of papers is much lower, they still account for a loss of 8% and 6% of all such papers. Given that these estimates are substantial, we believe that our paper documents a real shift in the composition, quality and international exposure of Hungarian research. We further estimate that the exits that are due to illiberal policies represent around 10% of all exits during the period.

Table 9. Aggregate Effects on Hungarian Academia

	Coefficient	Effect	Per-person/year	GE	GE (corrected)	GE/Total (%)
Pub. Hungarian	0.4191^{***}	52.1%	0.18037	50417.6	35031.8	11.9%
	(0.0530)					
Top 1% Pub.	-1.4588^{**}	−76.7%	−0.00818	−2286.7	−1588.8	−7.9%
	(0.4695)					
Top 10% Pub.	-0.8115^{***}	−55.6%	−0.02259	−6315.3	−4388.1	−5.8%
	(0.1641)					
Bottom 50% Pub.	0.4095^{***}	50.6%	0.07916	22126.2	15374.0	10.5%
	(0.0627)					
Exit Probability$^{(a)}$	0.0077^{***}	0.77 pp	0.00766	1610.2	1487.7	10.1%
	(0.0021)					

Notes: Coefficients are estimated via PPML (Poisson) or OLS (LPM) comparing researchers in Hungary with researchers in control countries. The estimation includes individual, year × field, and year × entry cohort fixed effects. Standard errors are clustered at the individual level. $^{(a)}$ Variables marked with (a) are estimated using a Linear Probability Model (LPM). *GE (total)* aggregates yearly effects $\sum_t (e^{\hat{\beta}} - 1) \times \bar{y}_{\text{pre}} \times N_t^{\text{total}}$ over entry cohorts 1990–2005. *GE (migration)* applies the same formula restricting N_t to researchers not yet migrated at year t. *GE/Total (%)* expresses *GE (total)* as a share of the total observed outcome: for publication outcomes, the denominator is the actual sum of publications by treated researchers in the post-period; for LPM outcomes (exit, migration), it is the number of treated researchers who experienced the event.

7 Conclusion

Our work shows how illiberal policies and political pressure can have a direct impact on researchers. We take the example of Hungary as a particularly relevant context and a quasi-natural experiment, in order to measure how such pressures on researchers can impact the quantity and quality of research. We first show that in Hungary, researchers are negatively affected by illiberalism based on their perceived political involvement. We show that researchers perceived as political opponents are negatively impacted in their research outcomes, both in quality and quantity, and are also more likely to stop publishing in Hungary. Academics that we identified as opponents also observe a contraction of their network within Hungary, suggesting that political pressure indeed makes collaboration more difficult for targeted individuals. While illiberal regimes often consider silencing political elites as a major aim, in the Hungarian context, targeted researchers have been the more likely to publicly show their opposition to the regime, which we interpret as the choice to *voice* against it in the "Exit, Voice, Loyalty" framework. Finally, we show that researchers that have been working on topics at odds with the politics of Fidesz, related to gender or minorities, also experience a negative shock, similarly to researchers more officially perceived as political opponents.

We then show that there is a strong negative impact of illiberalism on the international position of Hungarian academics by comparing the trajectory of Hungarian researchers to the trajectory of researchers from other comparable countries. Such a comparison, the first of this type to our knowledge, has been made possible by collecting extensive publicly available data from national repositories data from several countries in Central-Eastern Europe and combining it to an international database. Doing so, we demonstrate that, while the impact on research quantity is ambiguous, particularly depending on the publication language, the quality of research of Hungarian researchers is significantly negatively impacted. We then extend our analysis to a dataset combining national-level data information with international data on publications, which enables us to track the international mobility of researchers. We find that Hungarian researchers are more likely to emigrate out of Hungary, compared to researchers in Slovenia and Croatia. More generally, illiberal policies in Hungary lead to a contraction of the national network on itself: Hungarian researchers collaborate more with their national fellows to the detriment of their international collaborations.

We believe that our work is particularly relevant in a context in which rising political forces increasingly uphold the policies implemented in Hungary as a model to look up to. It contributes to an understanding of how not only the degradation of official, legal institutions but also the political atmosphere they generate can foster (or deter) innovation and the production of new ideas. While we recognize that our findings may not be fully generalizable to all contemporary political environments, the

targeting of academics is often among the earliest signs of a shift toward illiberalism. Our results suggest that academia, as an organized system for producing innovation through individual researchers, remains sensitive to political pressure, even in regimes that occupy the middle ground between full autocracies and liberal democracies. The increasing popularity throughout all democracies of political parties that advocate for similar regimes is therefore a strong concern for future innovation.

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Appendix

This Appendix presents further details on the political background, data collection, construction of variables, additional results and all robustness checks.

- Appendix A gives more details on the political context of Hungary and the state of academia before and after the 2010 elections. It also gives more detail on the case of the Central European University and descriptive statistics on the situation of the university.
- Appendix B provides a detailed explanation of the different data sources we collected and the harmonization process we performed up to our final data set.
- Appendix C is the appendix regarding sample and variables definitions.
- Appendix D presents complementary results that support the results we present in the main text.

A Political Background and the State of Academia in Hungary

In this section, we provide additional resources and descriptive statistics on the state of academia in Hungary (Appendix A.1) as well as on the particular case of the Central European University (Appendix A.2), about which we we display some descriptive statistics.

A.1 Descriptive evidence of the impact of illiberalism on Hungarian academia

We first present aggregate evidence and contextual information on the overall state of Hungarian research before and after 2010, marking the beginning of illiberal policy implementation.

We would first like to recontextualise academic freedom in the Hungarian context by underlining the fact that the profession is used to being silent regarding political topics. The period over which academics have been involved in the public discourse without hindrance has been short, lasting only about twenty years between the end of the explicit ideological control of the communist period and the changes induced by Fidesz after 2010. During this time, academia became closely involved in politics. However, the chilling effect mentioned in this paper is a return to an earlier affect from before 1989. The main difference that the literature identifies is that for those who are not self-censoring, instead of a ban on anti-government speech from academics, they are simply confined to the margins of publications by the State-aligned media, which does not even discuss their arguments. The combination of a fear for their livelihoods and the media takeover are the main reasons why academic freedom declined after 2010.

As a descriptive piece of evidence showing the rise of illiberalism in Hungary, we show that the Academic Freedom Index (AFI) has dropped since Orbán's reelection in 2010. This index is compiled by V-Dem to measure the level of academic freedom in each country on an annual basis based on private interviews with researchers. In Figure A.1.1, it is clear that Hungary diverges significantly from the trajectory of other Central and Eastern European countries[25]. The AFI for Hungary begins to decline sharply after 2010 and continues to deteriorate in the following years, while the rest only decline very slightly during Covid, which could be due to quarantine restrictions. None of the other countries see a drop with a similar magnitude as the one that we see in Hungary. Figure A.1.2 provides a more detailed view, displaying the individual components that are aggregated to construct the overall AFI. Although all dimensions taken into account by V-dem show a downward trend, some notable patterns emerge. In particular, the decline in "Institutional Autonomy" is especially strong in the Hungarian context, where academic freedom was initially challenged through governance reforms in 2011, 2014, and 2022. Interestingly, the indicator for "Cultural and Academic Expression" shows a sharp decline following the campaign against the Central European University and the adoption of the "Lex CEU" law. This trend may reflect the broader atmosphere of intimidation and pressure on academics between 2017 and 2019 (Kováts and Rónay, 2021; Jenne et al., 2022).

While we cannot conduct a causal analysis on the entirety of Hungarian researchers, we can still descriptively document the impact of this decrease in academic freedom.

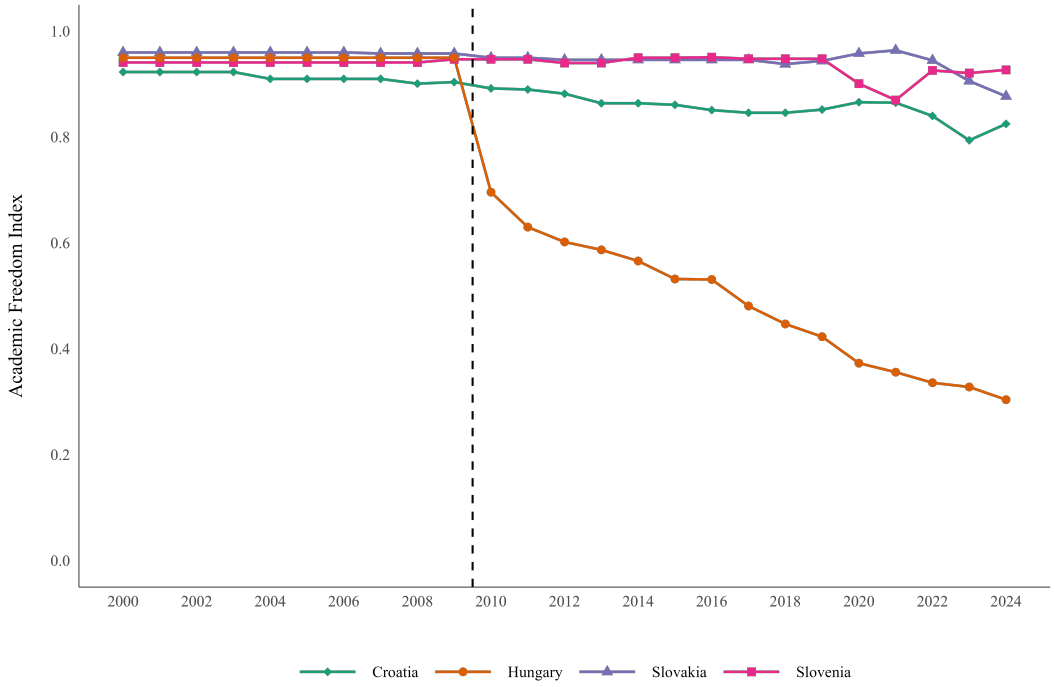
Figure A.1.3 highlights two notable patterns. First, it shows a slowdown in the size of PhD cohorts in public universities across all fields, with this decline becoming more pronounced after 2013. Second and interestingly, illiberal policies have not led to a reduction in the number of foreign PhD students. As the red curve in the figure indicates, the number of foreign students has continued to grow, representing an increasing share over time. In this sense, illiberal policies, in Hungary, do not appear to directly affect the arrival of foreign students; rather, their restrictive effects seem more targeted toward Hungarian researchers (see Section 6).

The trends observed in Figure A.1.3 for domestic researchers are echoed in Figure A.1.4, which displays a slowdown in the number of new researchers entering academia—especially after 2014–2015. These parallel trends also provide indirect validation of quality of the Hungarian CRIS data used in our analysis.

Kováts and Rónay (2021) make the case that the changes within the university and the use of media outlets to target scientists are two elements of a single strategy. This allows the government to maintain a controlled opposition within university to be able to point fingers at enemies of the regime, in a climate in

[25]This is the measure that we use in order to select the countries used as a control group. The countries from which we use affiliated researchers are selected in such a way that they do not experience the same changes in academic freedom levels as Hungary.

Figure A.1.1. Academic Freedom Index – Central-Eastern European Countries (2000-2024)



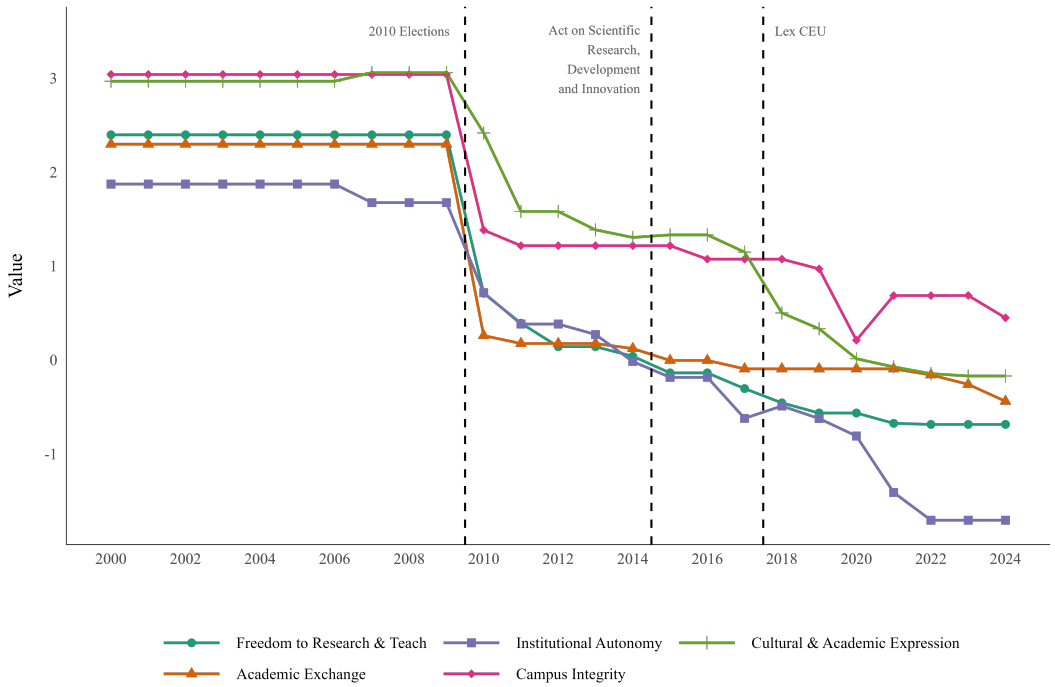
Notes: This graphs shows the normalized Academic Freedom Index (AFI), computed by V-Dem, fror Croatia, Hungary, Slovakia and Slovenia, between 2000 and 2024. We obtain data directly from the V-Dem website. The dashed line indicates the year Viktor Orbán took office. The value of the index goes from 0 (no Academic Freedom) to 1.

which they have promoted anti-intellectualism, and to swiftly deal with them by controlling the internal structure of the university. While researchers are is directly told not to work on certain topics, they are all aware that they could become a target at any time. For instance, they report the following citations from an interview with a researcher about their freedom to research and teach: "You don't need these politicians to ever have any direct say in your curriculum [...]. So they put the gun on the table and you never have to pull the trigger, and they may never pull the trigger, but that gun, you always see it. It's very powerful. In an environment that's been through that kind of socialization, it brutally restrains courage.".

A.2 The Central European University

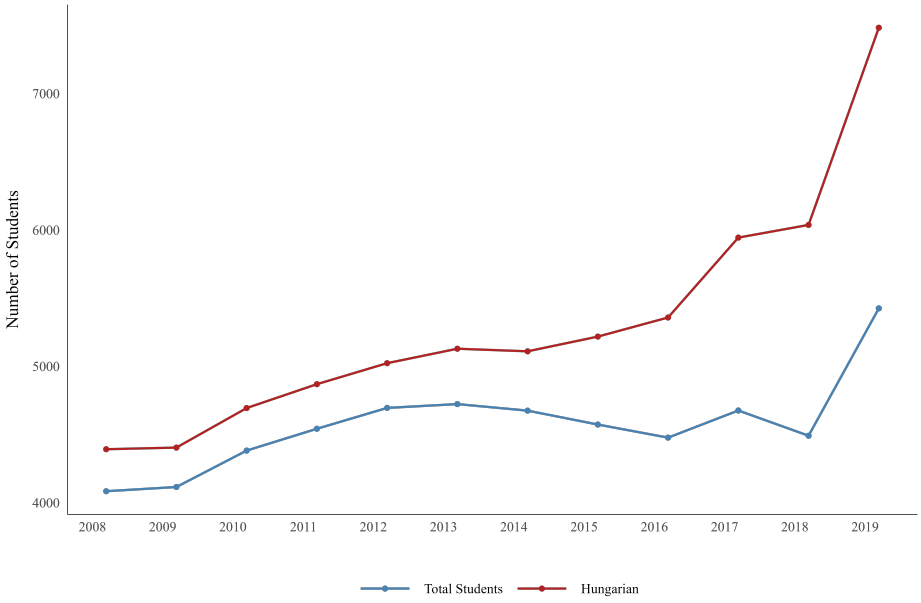
We first recapitulate the events leading up to the relocation of the CEU in Austria. In June 2018, after the election several "Stop Soros" legislative bills attempting to constrain the Hungarian civil society were introduced in Parliament; these laws banned people from helping undocumented immigrants and imposed a 25% tax on foreign donations to pro-immigrant NGOs (Benková (2019)). This led George Soros's Open Society foundation to move its headquarters from the country and the EU Parliament to vote a punishment for this breech of core EU values. Benková (2019) underlines the years-long campaign started in 2015 of Fidesz against George Soros, a billionaire from Hungary living in the US who is politically

Figure A.1.2. Decomposition of the Academic Freedom Index - Hungary (2000-2024)



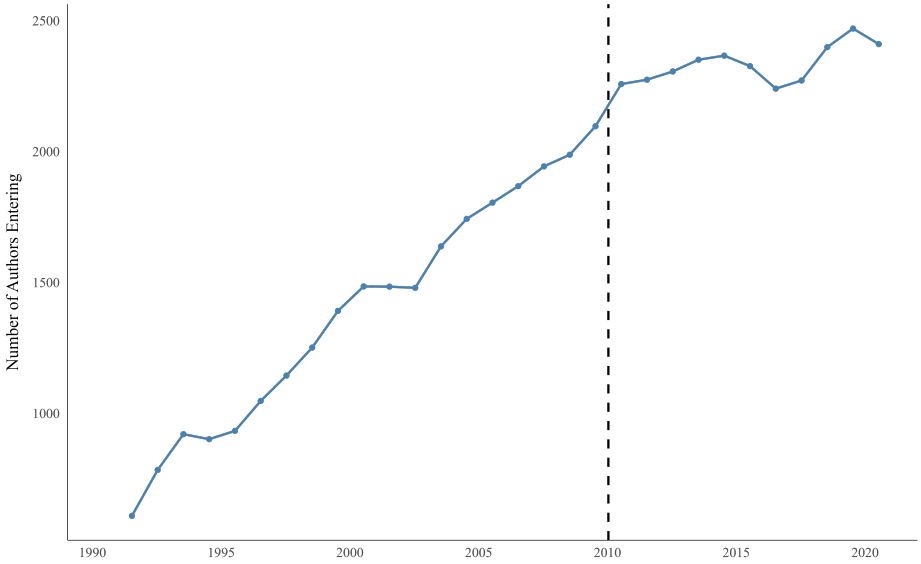
Notes: This graph shows the decomposition of the Academic Freedom Index (AFI), computed by V-Dem, for Hungary between 2000 and 2024. We obtain data directly from the V-Dem website. The dashed lines indicate the successive 3 main organizational reforms that we describe in Section 2 as being major turning points.

Figure A.1.3. Total Number of PhD Students in Hungary between 2008 and 2019 – by Nationality



Notes: The graph above displays the total number of PhD students enrolled at all Hungarian universities between 2008 and 2019. The data are sourced from the Hungarian Ministry of Higher Education. The count includes all students pursuing a doctorate, regardless of their year of study.

Figure A.1.4. Total Number of Entering Authors between 1990 and 2022 – CRIS



Notes: The graph above shows the total number of authors entering the Hungarian CRIS database (MTMT). An author's entry year is defined as the year of their first recorded publication. The dashed line indicates the year Viktor Orbán took office. To smooth overall trends, we compute a two-year rolling average; for example, the value shown for 2000 reflects the average number of new entries in 1999 and 2000.

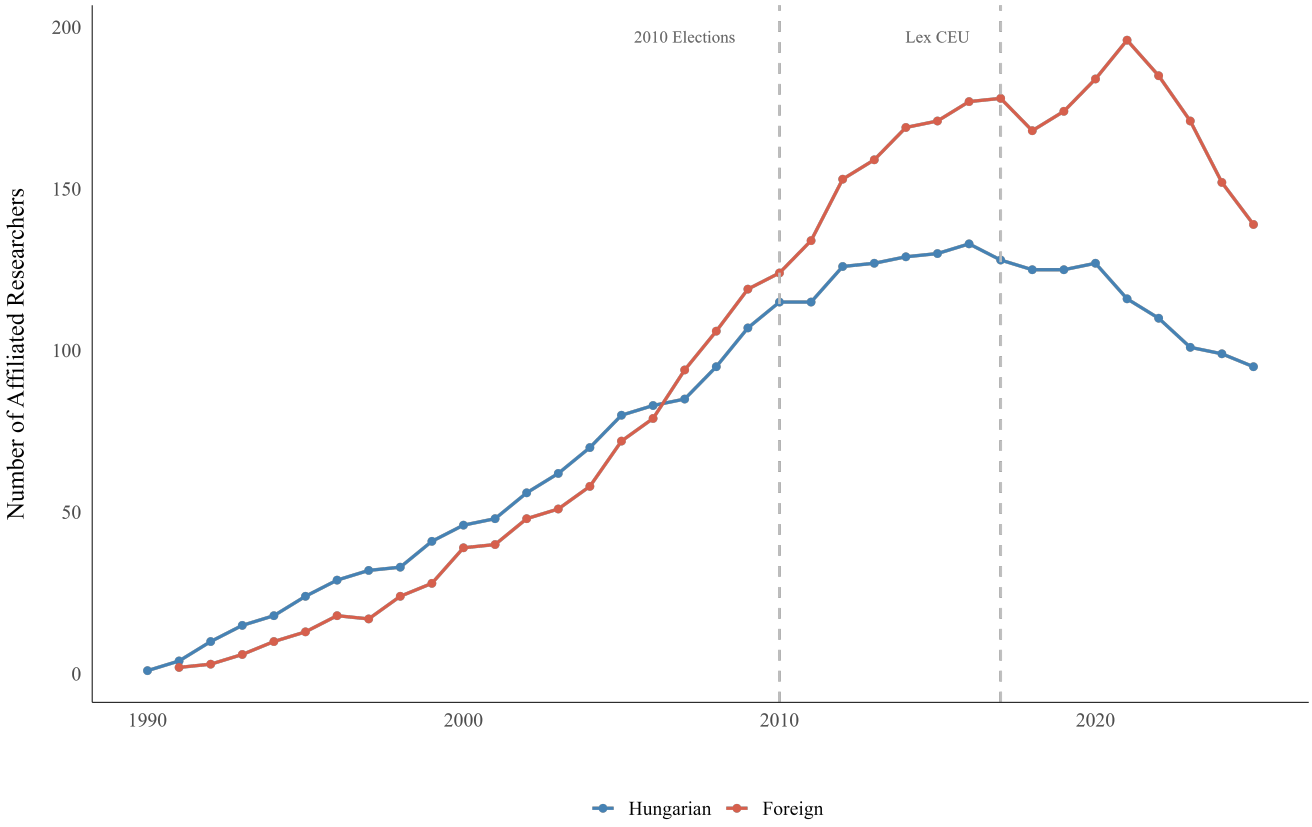
progressive, costing over 100 million euros. Krekó and Enyedi (2018) detail the goals as well as several stepping stones of this campaign. Finding this common enemy, the authors say, contributes to what Orbán calls a "cultural counter-revolution". The regime used its control of the media, including some private media receiving most of their funding from the state, to promote a narrative positing that progressive and pro-human rights movements in Hungary were funded by Soros, including publishing in the Figyelő a list of 200 academics and human rights activists accused to be "mercenaries of Soros". Orbán did not limit himself to such initiatives, however costly (about 250 million in US dollars on anti-Soros and anti-Brussels campaign in 2017 alone according to HVG[26], in publications, posters...).

We also present in this section some general descriptive evidence on the situation of the Central European University. Figure A.2.1 displays the number of researchers affiliated with Central European University each year between 1990 and 2025. The figure shows a steady increase in the total number of researchers—both Hungarian and international—until a shift occurs after 2010, particularly in the total number of Hungarian researchers affiliated to the university. Figure A.2.2 provides further insight on

[26]Hava Nikita, January 2018 24, "Incomprehensible numbers: we show how much Orbán spent on propaganda last year", on hvg.hu, retrieved 26/04/24 at https://hvg.hu/gazdasag/20180124_Ennyit_koltottek_el_Orbnek_tavaly_propagandara__itt_a_lista.

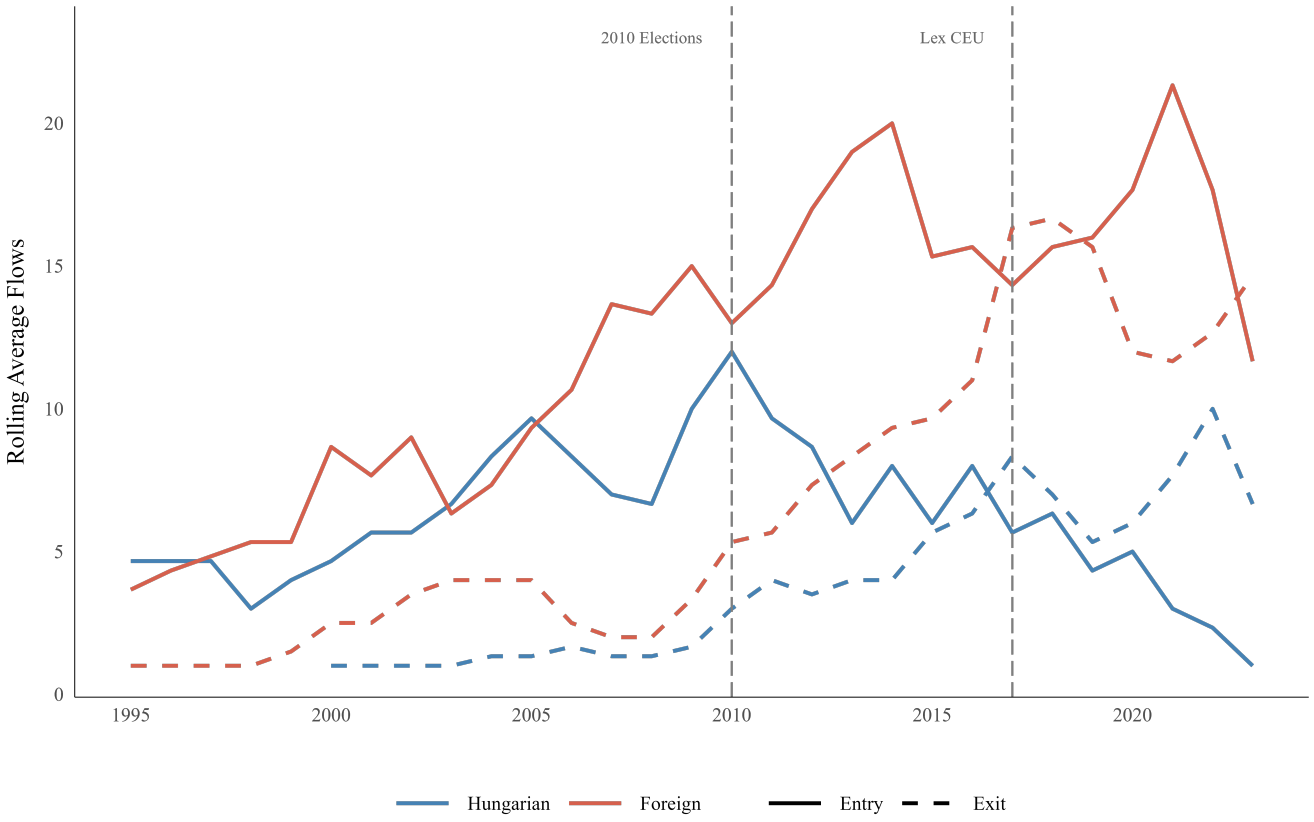
these trends. It shows that this change is driven by both an increase in the number of researchers leaving the Central European university and a sharp decline in the number of Hungarian researchers entering. Similar trends are observed for international researchers, although the decline in entries becomes most pronounced after 2014. Trends shift again after the "Lex CEU" and the main campus of the university leaving Budapest for Vienna in 2019.

Figure A.2.1. Number of Professors at the Central European University (1990-2025)



Notes: The graph aboves displays the total number of publishing researchers that we identified as being at the CEU. This statistics only includes researchers that published at least once.

Figure A.2.2. Exit flows of professors from the Central European University (2000-2025)



Notes: The graph above displays the flows of entering and existing researchers at the Central European University. Data comes from our data set matched by hand. To smooth overall trends, we compute a two-year rolling average; for example, the value shown for 2000 entries is the average number of new entries in 1999 and 2000.

B Data Collection and Harmonization Process

B.1 Collection of the data sets

OpenAlex is a fully open-access database. We use the full snapshot available from August the 29th, 2024. This iteration was released after a large improvement of author profiles resulting in the relabelling of all of them. We still find various instances of duplicated or mixed-up author profiles compared to what we find in national databases, a pitfall that is unavoidable given the size of the dataset.

Regarding the national repositories (Current Research Information System, CRIS), they are a combination of originally bibliometric data (MTMT, ODT for Hungary), project-based data compiled as open-access data on science productivity (SKCRIS for Slovakia and Isvavai for Czechia), and national library data combined with a researchers repository based on project-level data (SICRIS for Slovenia, COBISS for Croatia). All are public databases, but they do not provide a full data transfer, aside from Isvavai. In order to collect them entirely, we automatically collected the data through their API or website for MTMT, ODT and SKCRIS, and through the official register for SICRIS/COBISS. While we collected the data for Isvavai and SKCRIS, we cannot use them due to problems in the registration of authors or dates. Our data collection process is similar for all databases. We first collect the identifiers of all authors in the database. We then use these identifiers to obtain information at the author level. Afterwards, we use the identifiers to obtain information about the publications of each author. This allows us to build a publication-author level dataset which we can then aggregate at the author level for sample construction at a later stage. We harmonize the variables of the different datasets, which are similar due to their shared CRIS design, and append them together in order to build the full CRIS dataset. In order to derive the field of a given author, we map each field of science named in the database to the classification used by OpenAlex, first by hand for fields that are given an identifier, then by using cosine distance of embeddings in SciBert (Beltagy et al. (2019)) in order to find the closest field in OpenAlex classification. We also proceed in the same way in order to identify subfields for MTMT and SICRIS, for the fields that are detailed enough (for instance, "linguistics" is mapped to OpenAlex subfield #1203, "Language and linguistics"). We then use this mapping to retrieve the domain of publication of the author in the OpenAlex classification. Because this information is directly provided by universities or researchers themselves, we consider it more trustworthy than the automatically computed value of the same variable in OpenAlex. Therefore, for the authors who are in both samples, this is the variable that we use instead of the OpenAlex variable "topic share". We believe that this allows us to remove some of the measurement error over fields of an author.

Hungary: We use two databases to assess the state of research and characteristics of researchers in Hungary. The first of the two is the list of doctoral programme members and student publicly available on the official website of the National Doctoral Council (Ors zágos Doktori Tanács, later referred to as ODT). By law (Act CXXXIX of 2005 on higher education), all doctoral schools have been under

the scrutiny of the ODT (independent association) since 2007. The organisation had made mandatory starting from November 2007 for all doctoral schools to publish a public profile for each researcher of the country. The data on these profiles includes all academic titles of the researcher, the PHD students that she supervises, her research areas, her employment history and a list of her recent publications. All the information is directly entered by researchers themselves and validated by administrators of the doctoral school. Over all, the website contains about 52,000 profiles, from researchers or Ph.D. students. Any researcher who was active in a doctoral school after 2007 is supposed to have a profile, including now retired or deceased researchers. This public information was obtained through the website doktori.hu.

The other source is the Library of Hungarian Scientific Works (*Magyar Tudományos Művek Tára* or MTMT), a publication-level bibliometric database published in 2010. Five different institutions, namely the ODT, the Hungarian Accreditation Committee, the Hungarian Rectors Conference, the Hungarian Scientific Research Fund (OTKA) and the Hungarian Academy of Sciences – which is also responsible for its management – contributed to its creation (Holl et al. (2014)). It is managed directly at the university level. Hungarian publications in social sciences are likely to be badly indexed on non-specialized databases (few have a DOI, few on Scopus (Sasvári (2022))). The database was retrieved through calls to its API using researcher profiles. We harvest 1,768,488 scientific publications out of the about 5 million records[27] and 66,435 different author profiles from the database, which corresponds to the information recently provided by the curators of the data (Holl (2024))[28]. Among those, 15,643 are directly linked to a researcher profile in ODT.

Slovenia: SICRIS is created and maintained by IZUM, the Institute of Information Science, and the Slovenian Research and Innovation Agency (ARIS), instituted by the Research and Development Act 2002/26 (Curk et al. (2006)). ARIS is tasked to evaluate research projects and publishes the data that it obtains, not only at the project-level but also the researcher-, research group- and research institute-level. We use the SICRIS system to retrieve information about active researchers in Slovenia (48,022 records overall) (Korošec (2022)).

We then use the link provided by SICRIS to retrieve publication information for all these researchers in COBISS.net, which is the information system of Slovenian, North Macedonian, Serbian, Bulgarian, Albanian, Bosnian, Montenegrin and Kosovar libraries. Originating from the former communist system at the initiative of IZUM (Seljak (1994)), the database contains records on all publications from authors of the country, with relatively high quality (Badovinac (2021)). The COBISS.SI database contains over 7,3 million records. We only collect a subset of this through reports generated from authors of the SICRIS database, leading us to only consider 1,515,089 records. Some of the COBISS entries includes citations

[27] MTMT also records non-academic publications and other type of works such as musical performances which are not relevant to our analysis.

[28] A few researcher profiles are not visible for all users, but this concerns about a hundred profiles in the entire database.

obtained from other sources such as Web of Science, but not systematically[29].

Croatia: CRORIS is a project maintained by the Ministry of Science and Education of Croatia and the University Computing center, under project KK.01.1.1.03.0001 of the European Regional Development Fund, 2017. The project builds upon existing databases to create and maintain an Croatian CRIS that contains 920,921 publications and 52,169 researchers. We collect the entire dataset of publications of CRORIS through its API. CRORIS does not feature any citation data.

In order to use conjointly these data sources, we use the following steps to link the information available in them. First, we normalize the names of researcher profiles for each database. Then, for every field existing in each database, we match it to a field existing in OpenAlex (the classification of which is derived from the Scopus subject areas). We then match authors on their initials and last name. We keep matches that feature researchers with the same first and last name, provided that in the same OpenAlex-recoded field in the national database, there is only one researcher with that exact full name. We may keep matches that link the same national base researcher to several Open Alex profiles. Indeed, OpenAlex tends to create several profiles for the same author. We decide to trust that the authors profiles in the national databases are more accurate and we therefore assume that if an author has no homonym in the same field in these databases, it is more likely that a homonym profile in OpenAlex is an extra profile of the same person. Using this method, we are able to link to their OpenAlex profiles 15,372 Slovenian profiles and 59,629 Hungarian profiles.

B.2 Merging National and International Data

In order to conjointly use the different available data sources and reduce measurement error for our analysis, we reconcile the information available in these databases by merging them on common identifiers. For instance, in OpenAlex, a professor of literature corresponding to the ODT profile #14 corresponds not to one but to five different profiles. One of them features most of his publications (55) but 8 others are scattered across different profiles. In order to be able to compute our measurements of productivity, activity and location more precisely, we use the information available in the national CRIS to be able to tell that these profiles correspond to the same person.

We detail in this section how we deal with the several problems occurring in this process.

[29]Publications in other languages are frequent in the Hungarian CRIS data although it depends on the subjects (for instance theology and linguistics are often published in German) but less so in COBISS.

B.2.1 Details on the Merging Procedure

In theory, merging publications across databases should be easy. Indeed, every publication available online has a Digital Online Identifier (DOI) which should be the same across all databases. The issue we encounter is that for most publications in the databases, the DOI is not available (in MTMT, only 18% of publications have one). While there are other identifiers at our disposal, such as Web of Science or Scopus identifiers, merging only on those external identifiers does not allow us to capture most of the common information across databases. Therefore, we also merge on record title. In order to capture matches in which unicode encoding or capitalisation might be different, or using different stopwords, we normalise the titles by removing stopwords if the language of the publication is given, removing non-letter and non-digit characters, and converting the strings to the same encoding.

When we use matched authors to match publications, we further allow for some variation in publication title. Due to the fact that we may have removed stopwords in one record but not the other for the same publication due to missing data about the language, or simply to human error in typing the titles (for instance the title publication #12044 in MTMT includes "labortory" instead of "laboratory", preventing us from matching it directly to OpenAlex publication #1983568155), we keep matches in which the Levenshtein distance between normalized titles is below 10% of the length of the smallest of the two strings.

For author matches, we keep matches between authors who are shown by both databases to be the author of a matched publication, when their first name and last name are concordant, or when the Open Alex profile only has an initial instead of a first name and this initial and the first name are concordant. This allows us to match researchers even if they have the same name and publish in the same field, provided that the publications of two researchers with these common characteristics are not mixed together in OpenAlex.

In addition to this process, we further match researcher profiles based on names and fields. If a researcher is the only one in each database to have the same full name, or initial and last name, in a given field of publication, we decide that the match is probably true. This approach is complementary to the previous, as it allows us to retrieve researcher profiles for which publications have been mixed with homonyms from another field.

B.2.2 Eliminating Incorrect Matches

Due to the presence of homonyms in author names and in article names, we need to eliminate incorrect matches. While in theory, our procedure should allow us to distinguish authors who have the same name using their publications, this is not the case for all. Indeed, due to the size of the dataset, the author profile attribution algorithm in OpenAlex generates false links between authors and publications, on the

basis of homonyms[30]. Therefore, our process necessarily generates false matches between author profiles.

Conversely, as explained above, we may want to keep profiles or publications that are not matched one-to-one across databases. Due to the presence of duplicates for publications and author profiles, it appears efficient to keep at least some of them. In this step, we consider the national databases as a source of truth, due to the fact that they are at least partly managed by universities and researchers, who have an incentive to check their profiles directly and correct them. Conversely, due to the sheer size of OpenAlex, there is no possibility to double-check author profiles and publication duplicates for the entire world. Therefore, we keep all matches to OpenAlex who are matched to a single identifier in the other database.

B.2.3 Data collection disparities

Due to the fact that all of the databases that we exploit were made separately, it is likely that they collect publications systematically starting from different times. This possibility could bias our estimates of the effect of the regime change in Hungary. In particular, due to the European Sovereign debt crisis, it could be the case that one of the databases suffers from a loss of funding which would hinder its ability to collect data efficiently.

We show the total number of publications across national databases for the period 2000-2020, irrespective of any sampling. We observe that there is no large trend break in data collection for either of the two databases in 2010. While the growth of the number of scientific publications in COBISS seems to decrease after 2010, this should in theory only bias our estimates towards 0, instead of leading us to overestimate the effect of the regime change.

In order to harmonize the domain and the field, we use the OpenAlex format, which is itself adapted from Scopus. For the others, if we are able to link them to an OpenAlex profile, we use the field in which this profile publishes the most. This classification has 4 main domains (Life sciences, Social sciences, Physical Sciences and Health Sciences) and 34 fields in total. We allow for one author to be in several fields or domain at the same time. In that case, the authors would be identified as being in one unique field that would correspond to the intersection between the different field the author publishes in.

B.3 Political Alignment

We detail in this section how we build our sample of researchers that we believe could be considered as "political opponents" or as "loyalists". We consider as perceived political opponents all researchers that are affiliated to the Central European University and a sample of researchers that are working with

[30]For instance, some of the publications of the linguist and sociologist A5080416716 are attributed to her homonym A5004379723, who works on pulmonary diseases and endocrinology.

Non-Governmental Organization targeted by the Viktor Orbán policies. We consider as political loyalists members of the Batthyány Society of professors.

Central European University

We extract from OpenAlex all researchers affiliated with the Central European University since its creation. Given the relatively small sample size, we matched by hand CEU-affiliated researchers to their identifiers in the national CRIS database (MTMT) and in OpenAlex, based on publication records. To supplement and verify the data, we used researchers' personal websites, online CVs, and LinkedIn profiles to collect key information, including nationality, year of entry, and final year of affiliation with the Central European University. This process also allowed us to exclude deceased individuals and correct OpenAlex data when it reports wrong affiliations. For regression analyses using this sample, we restrict attention to researchers who began their affiliation with the Central European University prior to 2010—that is, before Viktor Orbán's return to power. This ensures we do not inadvertently include researchers who joined the university as a reaction to its political non-alignment with the current government.

Activists and NGOs

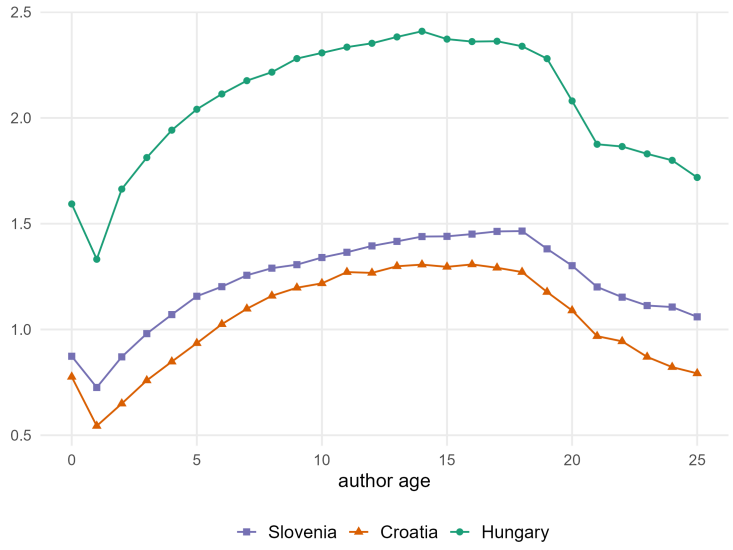
To identify researchers affiliated with NGOs, we use as a primary source the so-called "Soros list," a publicly circulated document published by *Figyelő*, a far-right newspaper. The list names around 200 academics and human rights activists accused of being "mercenaries of Soros." Approximately 80 individuals from this list are indexed in the Hungarian CRIS database.

Batthyány Society

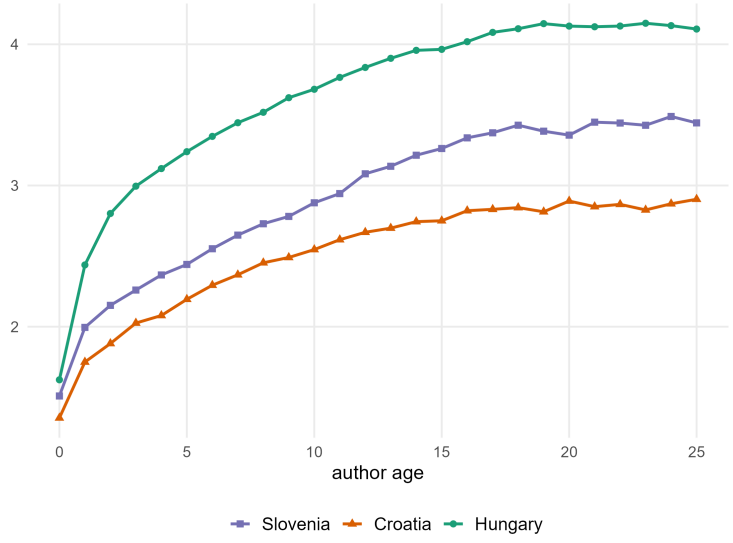
The full list of members of the Society can be found on their website. Similarly to the CEU, we matched them by hand to their identifiers in MTMT and in OpenAlex based on publication records. We also retrieve the same information for these researchers as the information we obtain for the Central European University.

B.4 Comparing Academic Trajectories between Central European Countries

Figure B.4.1. Average Publications Trajectories per Author



(a) Average Number of Publications per Year



(b) Average Number of Publications per Year, Conditional on Publishing

Notes: The graphs above plots the average number of publications per author in the different Current Research Information Systems that we take into account in the cross-country author-level analysis (Hungary, Slovenia and Croatia). Both graphs represent on the y-axis the career year since the entry in Academia.

C Appendix to Methodology

C.1 Sample Selection

Table C.1.1. Summary of Samples and their Selection Conditions

Name	Section	Database	Global criteria	Treatment group	Control group	Matching variables
Political opponents sample in national databases	subsection 5.1	MTMT	• Published between 1995 and 2005 • Entered after 1989	Political opponents entering before 2010, hand-matched (228)	Comparable Hungarian researchers (7,934)	• Entry year, field • Quantile of publications (total, in English, in Hu/Sl)
Political loyalists sample	subsection 5.1	MTMT	• Published between 1995 and 2005 • Entered after 1989	Politically loyal researchers entering before 2010, hand-matched (72)	Comparable Hungarian researchers (228)	• Entry year, field • Quantile of publications (total, in English, in Hu/Sl)
Targeted topics sample	subsection 5.1	MTMT	• Published between 1995 and 2005 • Entered after 1989	Researchers publishing in gender before 2010 in first 5 years of activity (1,253)	Comparable Hungarian researchers (6,396)	• Entry year, field • Quantile of publications (total, in English, in Hu/Sl)
Political opponents in OpenAlex	subsection 5.2	OpenAlex	• Published twice between 2000 and 2005 • Entered after 1989 • Most publications in HU/SI (2000–2005)	Political opponents entering before 2010, hand-matched (154)	Comparable Hungarian researchers (3,226)	• Entry year, field • Quantile of publications (total, in English, in top 5% journals), citations
Cross-country sample in national databases	section 6	MTMT, COBISS	• Published between 1995 and 2005 • Entered after 1989	Hungarian researchers (4,858)	Slovenian researchers (2,387)	• Entry year, field • Quantile of publications (total, in English, in Hu/Sl)
Cross-country sample in OpenAlex	section 6	OpenAlex	• Published twice between 2000 and 2005 • Entered after 1989 • Most publications in HU/SI (2000–2005)	Hungarian researchers (3,221)	Slovenian researchers (2,101)	• Entry year, field • Quantile of publications (total, in English, in top 5% journals), citations

C.2 Definition of the Non-Aligned Topics

This section details how we identify publications belonging to three thematic categories: gender-related topics, rule of law and democracy, and broader sensitive political topics. Our classification relies on the presence of specific keywords and expressions in publication titles. For each category, we construct a curated list of terms commonly associated with the corresponding literature. To reduce noise, we classify an author as contributing to a given topic based on a whether they published a number of these types of publications strictly superior to 1.

C.2.1 Definition of Gender Publications

We identify gender-related publications using a set of keywords capturing the main dimensions of gender studies, including social theory, health, sexuality, and family structures. The list is designed to cover both conceptual and empirical work in the field. This topic includes several interconnected subtopics. First, gender relations and feminist theory (*gender*, *women*, *sexism*, *patriarchal*, *feminism*, *stereotype*, *toxic masculinity*, *intersectionality*) explores power structures, social norms, and inequalities shaping gendered experiences. Second, reproductive health and biomedical dimensions (*reproductive health*, *abortion*, *contraception*, *fertility*, *pregnancy*, *childbirth*, *gynecologic*, *menopause*, *uterus*, *ovary*) focuses on the biological, medical, and embodied aspects of reproduction. Third, sexuality, rights, and gender-based violence (*sexuality*, *sexual empowerment*, *sexual harassment*, *sexual violence*, *female genital mutilation*, *forced sterilization*, *partner violence*, *femicide*) addresses bodily autonomy, rights, and forms of gendered harm. Fourth, LGBTQ+ identities and gender diversity (*LGBT*, *lesbian*, *gay*, *transgender*, *non-binary*, *queer*, *intersex*, *sexual orientation*, *trans rights*) highlights issues of identity, recognition, and inclusion. Finally, family, labor, and social organization (*domestic labor*, *care economy*, *motherhood*, *maternity*, *family policy*, *child marriage*, *gendered division of labor*) examines how gender structures everyday life, institutions, and economic relations.

C.2.2 Definition of Rule of Law Publications

To capture publications related to the rule of law and democratic institutions, we rely on a set of keywords commonly used in discussions of institutional quality, civil liberties, and authoritarian dynamics. These terms are frequently mobilized in academic work critically engaging with illiberal policies and democratic backsliding. This topic which includes several interconnected subtopics. First, fundamental rights and legal principles (*human rights*, *civil rights*, *fundamental rights*, *rule of law*, *constitutional law*, *legal equality*, *fair trial*, *access to justice*) refers to the normative and institutional foundations that protect individual freedoms and ensure legal accountability. Second, political ideologies and authoritarian dynamics (*authoritarian*, *nationalism*, *political conservatism*, *populism*, *radical right*, *far right*, *autocracy*, *illiberalism*, *fascist*) captures ideological currents and regimes that challenge or reshape democratic

norms. Third, democratic erosion and institutional capture (*democratic backsliding*, *erosion of democracy*, *judicial capture*, *politicized judiciary*, *constitutional crisis*, *manipulated elections*, *electoral fraud*, *state capture*) highlights processes through which democratic institutions are weakened or subverted. Fourth, surveillance, repression, and state control (*state surveillance*, *mass surveillance*, *political repression*, *police state*, *censorship*, *propaganda*, *arbitrary detention*, *state violence*, *enforced disappearance*) focuses on coercive tools used to monitor, control, and silence populations. Fifth, corruption and governance practices (*corruption*, *kleptocra*, *cronyism*, *clientelism*, *nepotism*, *bribery*, *patronage system*, *abuse of power*) examines informal and illegal mechanisms of power consolidation. Finally, freedoms, civil society, and academic autonomy (*freedom of speech*, *freedom of expression*, *freedom of the press*, *freedom of assembly*, *academic freedom*, *university autonomy*, *media freedom*, *shrinking civic space*, *chilling effect*) addresses the conditions necessary for open debate, knowledge production, and democratic participation.

C.2.3 Definition of Sensitive Topics

Finally, we define a broader category of sensitive political topics encompassing social justice, political conflict, and authoritarian practices. The associated keywords capture themes that are often politically salient, contested, or ideologically charged. This topic includes several interconnected subtopics. First, migration, borders, and global inequalities (*migrant*, *refugee*, *asylum*, *borders*, *internationalism*) highlights transnational movements of people and the political and ethical issues surrounding displacement and border regimes. Second, economic systems and class struggle (*capitalism*, *neoliberal*, *exploitation*, *social inequality*, *economic justice*, *income redistribution*, *anticolonialism*, *anti-imperialism*) focuses on critiques of economic structures and their role in producing inequality and domination. Third, labor, workers, and collective action (*workers*, *labor condition*, *trade union*, *workers' rights*, *workers' movement*, *class struggle*, *proletariat*) examines material conditions, labor organization, and social conflict. Fourth, left-wing ideologies and revolutionary thought (*marxism*, *communism*, *socialism*, *anarchism*, *left-wing*, *progressive politics*, *revolutionary theory*) captures political doctrines and movements advocating systemic transformation. Fifth, identity, discrimination, and social justice (*racism*, *antisemitism*, *islamophobia*, *sexism*, *intersectional*, *racial discrimination*, *equal opportunity*, *solidarity*) addresses inequalities based on identity and struggles for inclusion and rights. Sixth, historical violence, genocide, and memory (*holocaust*, *genoci*, *extermination*, *deportation*, *slave trade*, *denazification*) reflects on mass violence, collective trauma, and historical accountability. Seventh, authoritarianism and political repression (*autocracy*, *totalitarianism*, *dictator*, *fascism*, *police state*, *repression*, *surveillance state*, *cult of personality*) examines coercive regimes and mechanisms of control. Eighth, democratic erosion and institutional abuse (*democratic backsliding*, *judicial capture*, *electoral fraud*, *state capture*, *corruption*, *clientelism*, *abuse of power*) highlights processes undermining democratic governance. Finally, civil liberties and resistance (*freedom of speech*, *press freedom*, *censorship*, *political persecution*, *torture*, *political prisoner*, *exile*) emphasizes the

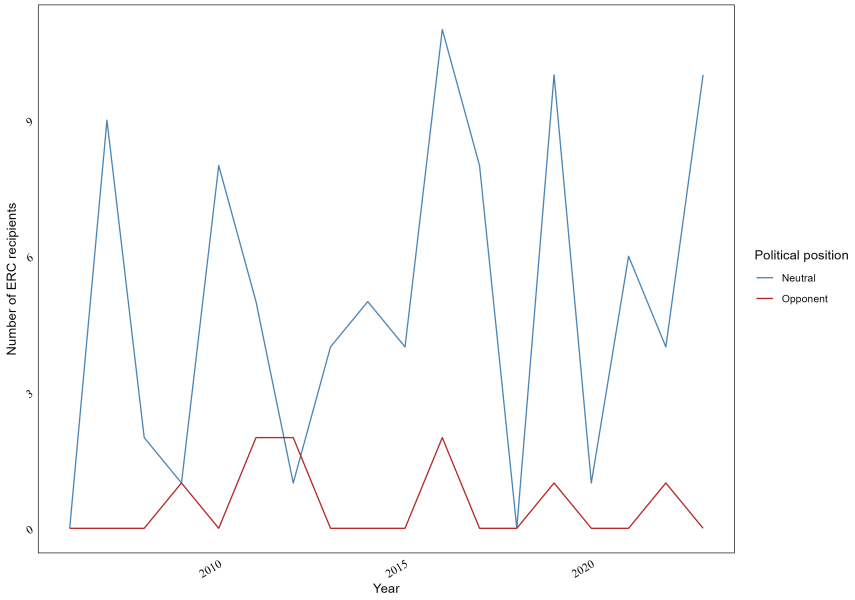
restriction of freedoms and the struggles against oppression.

D Appendix to the Results

D.1 ERC Funding and the Effect of Illiberalism

Figure D.1.1 shows the total number of ERC recipients per year among our sample of political opponents and researchers from the database tagged as neutral, matched on 5-year entry year windows. Given that only a very small share of Hungarian researchers are part of the political opponents sample, there does not appear to be a strong decreasing trend in the number of ERC recipients in either group. The composition of the groups is quite different, with the vast majority of the political opponents who received an ERC in social sciences. Restricting the focus to researchers in social sciences, Figure D.1.2 shows a strong decreasing trend in the number of publications for political opponent ERC recipients.

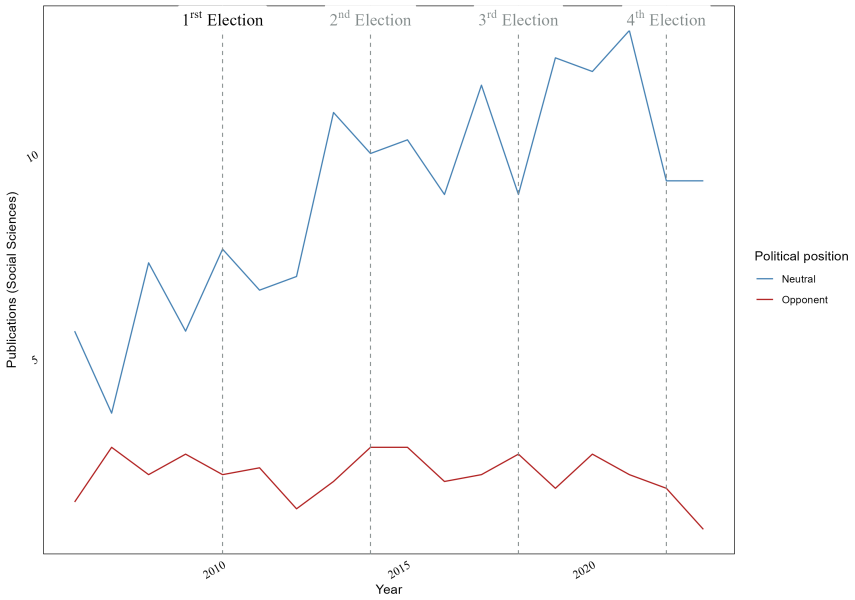
Figure D.1.1. Number of ERC recipients per year per political status



Notes: The graph above reports the total number of ERC recipient by call year for researchers of the CEU and the "Soros-list" researchers and to other Hungarian researchers for the period 2006-2023.

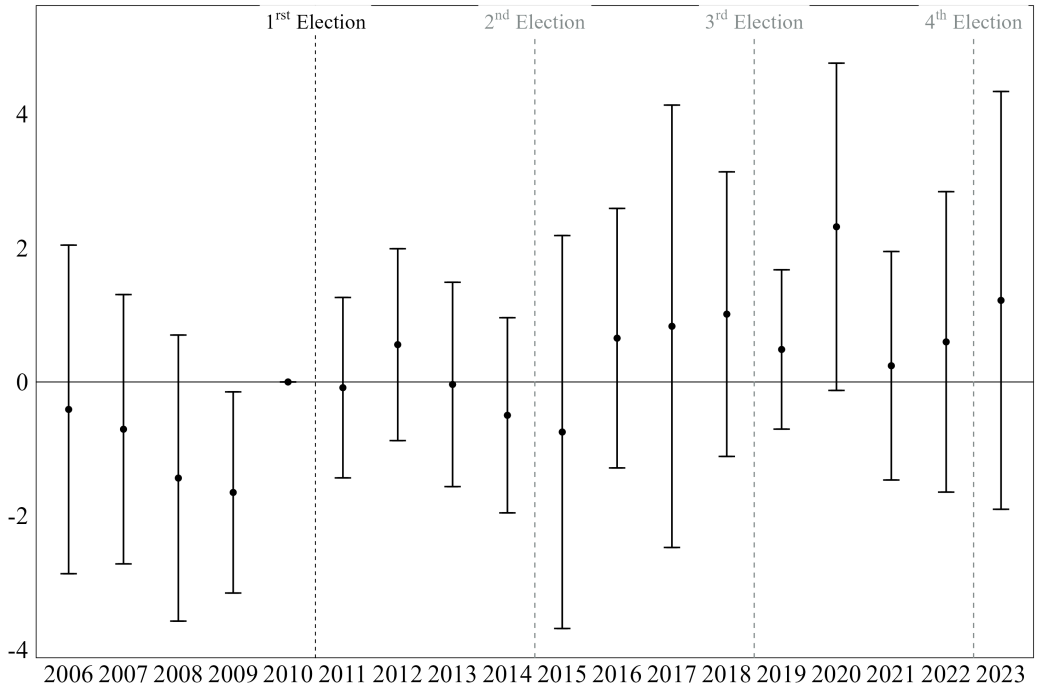
We perform the exact same analysis as in the main text, but with our cross-country comparison data, excluding any politically aligned author. Figure D.1.3 shows the interaction of the dummy variable for ERC funding, the dummy variable for Hungarian researchers, and year. Compared to other ERC recipients, the trend in total publications does not change at all, while the overall estimate remains significant. Again, this suggests that funding is not the only channel through which the regime impacts researchers.

Figure D.1.2. Number of Publications for ERC Recipients, Social Sciences, per Political Group



Notes: The graph above reports the average number of publications for ERC recipients in social sciences each year divided in researchers of the CEU and the "Soros-list" researchers and to other Hungarian researchers for the period 2006-2023.

Figure D.1.3. Effect on the Number of Publications for ERC Recipients



Notes: The graph above reports Fixed-Effect OLS regression estimates for the difference in the number of publications by year for Hungarian researchers who received an ERC compared to control group countries (Slovenia and Croatia) researchers for the period 2006-2023. Authors are matched using their ERC status and a 5 year bin of entry years. The dataset is winsorized at the top of the distribution at the 1 percent level for the outcome variable.

D.2 Non-Aligned and Aligned Researchers

Table D.2.1. Effect on Research Outcomes – Loyal Researchers

	publications (1)	pub. in english (2)	pub. nat. language (3)	nr pub. top 5% (4)	nr co-authors (5)	nr new co-authors (6)	pub. *rule of law* (7)
conservative × post	0.3070	0.5953**	0.1054	-0.0142	2.067***	0.8752**	0.0073
	(0.6443)	(0.2444)	(0.4278)	(0.1455)	(0.7728)	(0.3395)	(0.0059)
Observations	12,708	12,708	12,708	12,708	12,708	12,708	12,708
R^2	0.662	0.755	0.596	0.702	0.768	0.568	0.235
Within R^2	0.000	0.003	0.000	0.000	0.004	0.002	0.000
Mean.Dep.Var.Pre	4.172	1.203	2.513	0.365	3.551	1.751	0.002
author fixed effects	✓	✓	✓	✓	✓	✓	✓
year × field fixed effects	✓	✓	✓	✓	✓	✓	✓
year × entry cohort fixed effects	✓	✓	✓	✓	✓	✓	✓

Control variables account for trends for the matching cell over time. Standard errors (SE) are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

Table D.2.2. Effect on *Voicing* behaviours – Political Opponents Treatment

	pub. *rule of law*			share pub. *rule of law*		
	(1)	(2)	(3)	(4)	(5)	(6)
political opponent × post	0.0775***			0.0153***		
	(0.0247)			(0.0041)		
CEU × post		0.0586**			0.0103**	
		(0.0253)			(0.0046)	
NGO × post			0.1632**			0.0271***
			(0.0724)			(0.0094)
Observations	123,048	121,932	120,852	78,546	77,675	76,936
R^2	0.311	0.289	0.300	0.243	0.238	0.229
Within R^2	0.002	0.001	0.002	0.001	0.000	0.001
Mean.Dep.Var.Pre	0.006	0.006	0.006	0.002	0.002	0.002
author fixed effects	✓	✓	✓	✓	✓	✓
year × field fixed effects	✓	✓	✓	✓	✓	✓
year × entry cohort fixed effects	✓	✓	✓	✓	✓	✓

Note: results are from Fixed-Effect OLS regression, for each outcome, on data from MTMT. The unit of observation is author by year and the sample period is from 2005-2023. Control variables account for trends for the matching cell over time. Standard errors (SE) are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

Table D.2.3. Effect on academic performance and *voicing behaviours* – Political Opponents Treatment

	publications		pub. w. affiliation outside Hungary		pub. w. affiliation only in Hungary		nr pub. top 5%		pub. *rule of law*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Pol. opponent × post = 1	0.6740***		0.7554***		-0.2536		0.1619***		0.0619***	
	(0.1606)		(0.2566)		(0.2771)		(0.0386)		(0.0200)	
Pol. opponent × post (1rst mandate)		0.5401***		-0.0297		0.1578		0.1351***		0.0254
		(0.1523)		(0.2586)		(0.3008)		(0.0352)		(0.0166)
Pol. opponent × post (2nd mandate)		0.9499***		0.6708**		0.0933		0.1839***		0.0674**
		(0.2127)		(0.3227)		(0.3215)		(0.0427)		(0.0294)
Pol. opponent × post (3rd mandate)		0.4464		1.507***		-0.7195		0.2416***		0.0413
		(0.2748)		(0.4900)		(0.4950)		(0.0729)		(0.0283)
Observations	26,131	24,191	6,734	6,103	6,734	6,103	26,131	24,191	26,131	24,191
R^2	0.537	0.547	0.634	0.650	0.525	0.544	0.547	0.554	0.197	0.231
Within R^2	0.003	0.004	0.006	0.013	0.000	0.002	0.003	0.004	0.003	0.003
Mean.Dep.Var.Pre	1.046	1.046	0.370	0.370	1.820	1.820	0.109	0.109	0.005	0.005
final_id fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
year × entry cohort fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
year × field fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: results are from Fixed-Effect OLS regression, for each outcome, on data from OpenAlex. The unit of observation is author by year and the sample period is from 2006-2020. Control variables account for trends for the matching cell over time. Standard errors (SE) are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

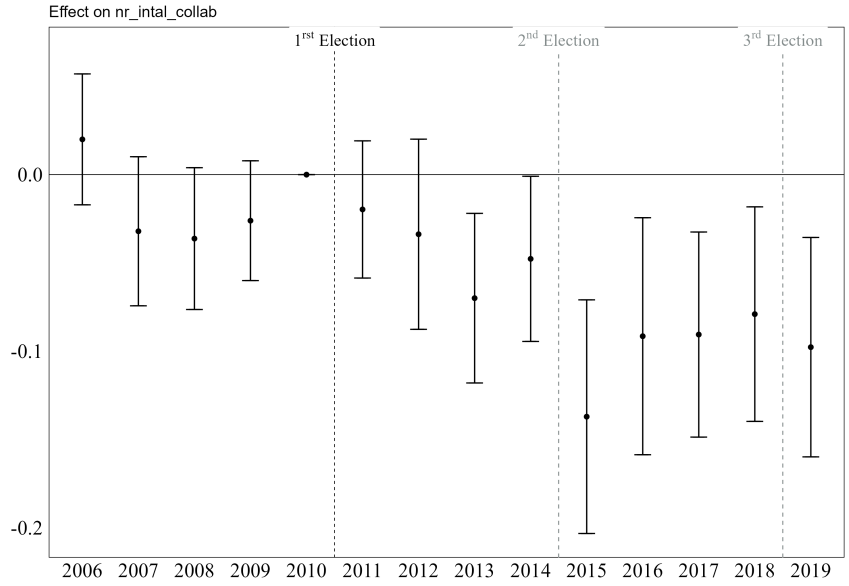
D.3 Cross-country comparison with OpenAlex data

Table D.3.1. Effect on Migration, Hungarian vs. Central Europe

	affiliation in other country for over 2 years		for over 3 years		emigrated	
	(1)	(2)	(3)	(4)	(5)	(6)
treat × post = 1	0.0114***		0.0144***		0.0146***	
	(0.0038)		(0.0038)		(0.0046)	
treat × post (1rst mandate)		0.0131***		0.0130***		0.0109***
		(0.0036)		(0.0035)		(0.0041)
treat × post (2nd mandate)		0.0117**		0.0163***		0.0202***
		(0.0047)		(0.0047)		(0.0057)
treat × post (3rd mandate)		0.0101*		0.0139***		0.0165**
		(0.0055)		(0.0053)		(0.0067)
Observations	203,938	203,938	203,938	203,938	203,938	203,938
R^2	0.667	0.667	0.683	0.683	0.806	0.806
Within R^2	0.000	0.000	0.000	0.000	0.000	0.001
Mean.Dep.Var.Pre	0.078	0.078	0.063	0.063	0.098	0.098
final_id fixed effects	✓	✓	✓	✓	✓	✓
year × entry cohort fixed effects	✓	✓	✓	✓	✓	✓
year × field fixed effects	✓	✓	✓	✓	✓	✓

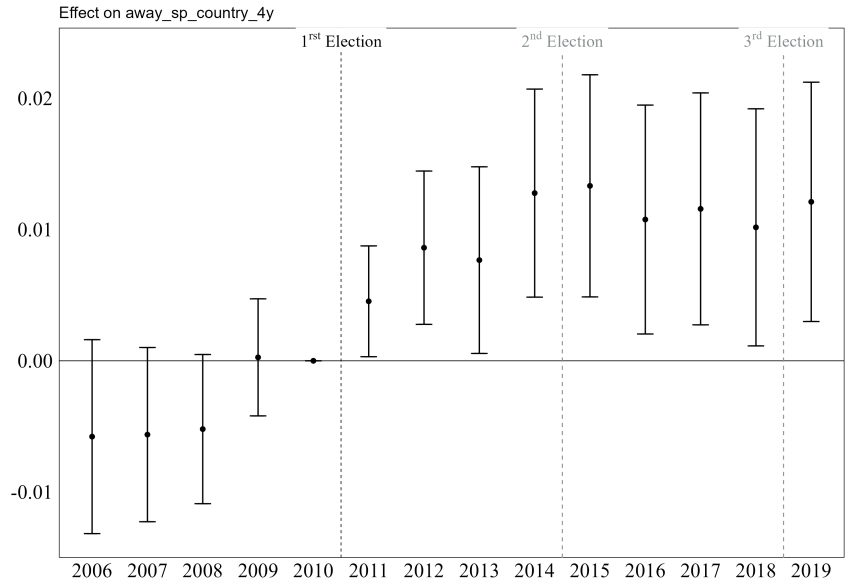
Note: results are from Fixed-Effect OLS regression, for each outcome, on data from OpenAlex. The unit of observation is author by year and the sample period is from 2005-2020. Treated authors are authors from Hungary. Control authors are Slovenian researchers matched to the treated. The dependent variable is an indicator variable taking the value 1 if the author publishes with an affiliation outside of Hungary for the treateed and Slovenia for the control after that date for two or three consecutive years (resp. columns (1), (2)), and another indicator variable taking the value 1 if the author is never seen publishing with an affiliation in Hungary for the treateed and Slovenia for the control after that date (column (3)). Control variables account for trends for the matching cell over time. Standard errors (SE) are clustered by author. *** p<0.01, ** p<0.05, * p<0.1.

Figure D.3.1. Effect on the number of publications with international co-authors



Notes: The graph above reports Fixed-Effect OLS regression estimates for the difference in the number of publications with co-authors outside of their country for the period 2006-2019. Authors are matched using their first year of publication and field of research. The dataset is winsorized at the top of the distribution at the 1 percent level for the outcome variable.

Figure D.3.2. Effect on the probability not to have published in the home country



Notes: The graph above reports Fixed-Effect OLS regression estimates for the difference in the probability of not publishing in their country of affiliation for the period 2006-2019. This graph uses the variable definition using a period of 4 continuous years. Authors are matched using their first year of publication and field of research. The dataset is winsorized at the top of the distribution at the 1 percent level for the outcome variable.