From Lab to Limelight: Media's Role in Boosting Scientific Impact

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Abstract

Scientific inequality persists due to the disproportionate allocation of attention and resources, often favoring elite researchers and institutions. While coverage of scientific research in media can draw wider audience and reshape the attention, it remains unclear whether it reinforces "rich-getting-richer" dynamics or helps democratize recognition. This study examines the impact of press releases—the primary channel for disseminating scientific news from universities to media outlets—on academic recognition and explores whether media attention influences scientific inequality. Using matched publication–press release data from the biomedical field across major U.S. universities over 25 years and leveraging plausibly exogenous variation in university press office workloads as an instrumental variable, we find that press releases significantly increase citations. Notably, the benefits are most pronounced for early-career researchers and papers published in lower-ranked journals. These findings indicate that strategic science communication can democratize attention in academia, helping to foster a more equitable scientific enterprise.

1 Introduction

Scientific merit should, in theory, be the sole determinant of recognition and success in science (Merton, 1973). However, research consistently shows that rewards in science are concentrated among a small, elite group of scientists and institutions (Zuckerman, 1970; Way et al., 2019; Nielsen and Andersen, 2021; Katz and Matter, 2020). This concentration stems not just from research quality but also other factors like luck (Bol et al., 2018; Merton, 1973; Zuckerman, 1977) or socioeconomic background (Stansbury and Schultz, 2023; Bell et al., 2019) that influence access to resources essential for producing high-quality work. Scientists with resource advantages are better positioned to produce higher-quality research, which in turn garners more rewards. This dynamic creates a self-reinforcing cycle—often referred to as the Matthew Effect—where researchers with greater resources continue to amass more, enhancing their capacity to produce impactful work, while those with limited resources remain at a persistent disadvantage (Merton, 1968, 1988; Azoulay et al., 2014; Bol et al., 2018; Zhang et al., 2022; Nielsen and Andersen, 2021; Way et al., 2019; Petersen et al., 2014). The imbalance in recognition not only hinders individual career advancement, but also narrows the diversity of voices in science

(Leahey, 2007; Hofstra et al., 2020) and constrains the range of ideas reaching both the scientific community and the broader public (Kozlowski et al., 2022; Nagaraj et al., 2020).

The inequalities in rewards and recognition are fundamentally shaped by how scientific knowledge is disseminated, evaluated, and valued across the research ecosystem. With research output growing exponentially over the past century, stakeholders—including scientists, funders, industry partners, and policymakers—struggle to keep pace with new developments. Faced with limited attention spans and overwhelming information, these actors often rely on prestige and social cues to filter what they engage with. While this attention-filtering mechanism can reinforce existing inequalities by directing focus toward already-prominent work, it can also potentially break established patterns when research from non-elite sources captures widespread attention.

While much focus has been placed on how research funding and academic reward systems shape scientific inequality (Xie, 2014; Bak and Kim, 2019; Azoulay et al., 2011; Swider-Cios et al., 2021; Lagisz, 2023; Hu, 2019), or how the quality and collaboration of scientific work influences its diffusion (Siler et al., 2015; Teodoridis et al., 2019; Bikard et al., 2019; Nishioka et al., 2022), the role of attention in reinforcing or disrupting the dynamics behind the Matthew Effect remains underexplored. Scientists can draw attention to their work through various channels. They can build visibility by attending conferences, participating in networking activities, engaging key audiences, or publishing in scientific journals to raise awareness of their research (Balsmeier et al., 2023; Htoo et al., 2023; Chai and Freeman, 2019; Azoulay et al., 2017, 2019). However, while these efforts are effective for reaching a more limited, specialized audience within a given field (Myers, 1985; Cheng et al., 2023), scientific findings often have broader impacts that extend to other disciplines which may be limited by lack of awareness and barriers such as specialized language (Lucy et al., 2023).

The scientific press provides an alternative channel to draw the attention of broader and diverse audiences (Kiernan, 2003; Fischhoff and Scheufele, 2013). When new scientific discoveries make headlines in newspapers, magazines, and digital platforms, they reach far beyond the specialized journals where they originate. Scientific press can amplify research impact by translating complex findings into accessible language for diverse audiences and facilitate cross-disciplinary use of science which leads to more novel innovations (Uzzi et al., 2013). Much of this coverage is shaped by press releases from universities and academic journals, which allocate significant resources to Press Information Offices (PIOs) and employ professional science journalists to highlight key research findings and contextualize their broader significance for broader consumption, thereby popularizing new discoveries (Anderson et al., 2020; Peters, 2013; Fischhoff and Scheufele, 2013; Kolf and Griswold, 2013).

While researchers across various fields have emphasized the importance of media in the dissemination of scientific knowledge, there is limited empirical evidence on its actual impact. Addressing this gap, and recognizing the critical role of Press Information Offices (PIOs) as intermediaries between researchers and the mass media, this study investigates how press release coverage influences the recognition scientific work receives. PIOs play an influential role in shaping which research attracts broader media coverage, serving as external drivers of attention. By summarizing and framing the

findings of new scientific papers in accessible and engaging ways, PIOs help journalists and the public understand the significance and implications of the research, thereby broadening the reach and impact of research (Jamieson, 2017; Rowe and Brass, 2011; Landrum, 2017).

Press releases have the potential to significantly boost an academic paper's visibility and elevate its authors' profiles within the academic community. Yet, it remains unclear whether press coverage reinforces existing inequalities or if it serves as a democratizing force. Researchers and institutions with greater resources often have more robust press support, allowing them to effectively promote their studies and capture media attention, which can perpetuate a cycle of visibility favoring those already in privileged positions. Conversely, press coverage also has the potential to elevate underrepresented voices, drawing attention to research from smaller institutions or early-career scientists that might otherwise remain overlooked. By determining which discoveries gain prominence in mass media and subsequently within academia and public discourse, press releases act as a powerful arbiter of attention, capable of either amplifying disparities or fostering a more equitable distribution of recognition in science.

In this paper, we investigate the impact of press releases on both the citation rates of scientific papers and scientific inequalities. Our analysis addresses two central research questions: First, do press releases have a causal effect on the diffusion of scientific ideas through citations? This question examines whether increased media attention directly influences the visibility and diffusion of scientific findings by boosting the citation counts of published research. Second, are the effects of press releases on citations uniformly distributed across the scientific community? Specifically, we explore whether the benefits of press releases extend equally to scientists at different career stages and for papers published in journals of varying rankings.

To explore the relationship between press releases and the dissemination of scientific knowledge, we address two key challenges. The first is data availability - while bibliometric databases track publications and journal information, systematically identifying which papers received press coverage has been difficult. We solved this by building a comprehensive dataset linking scientific publications to their associated press releases through EurekAlert, the American Association for the Advancement of Science (AAAS) platform that connects universities and journals with journalists. Our dataset captures 34,797 press releases for peer-reviewed papers from 1996 to mid-2021.

The second challenge is methodological - disentangling press coverage effects from paper quality, since stronger research can attract more media attention. We address this through an instrumental variable (IV) approach that leverages week-to-week fluctuations in university press office workload. Since authors generally cannot control publication timing, and press offices have limited capacity, papers published during high-workload weeks are less likely to receive press coverage, regardless of quality. By using these quasi-random workload variations as an instrumental variable (IV), we can measure how press coverage itself affects a paper's impact, separate from the paper's inherent quality.

Our study provides the first causal evidence that press releases directly influence how scientific knowledge spreads. Papers featured on EurekAlert receive more citations, revealing a clear link between media attention and scientific recognition. Moreover, we find that press coverage helps

level the playing field in science rather than reinforcing existing hierarchies. This democratizing effect emerges from differences in marginal benefits: elite scientists, who already command attention through institutional prestige and established networks, gain relatively less from additional press coverage. In contrast, press releases provide a crucial platform for talented researchers who may otherwise be overlooked - including early-career scientists and authors publishing in lower-ranked journals. By amplifying work from these researchers, media coverage helps counteract the Matthew Effect, where scientific recognition tends to accumulate among already-prominent scientists.

By highlighting how press releases influence scientific visibility, this research contributes to a broader understanding of the mechanisms driving inequality in science. Specifically, our findings advance the literature on the science of science (Angrist et al., 2017), identifying press releases as a key factor in mitigating inequalities in citation distribution. This directly addresses recent debates about whether the pace of scientific progress is slowing (Jones, 2009; Bloom et al., 2020). Even if the pace of scientific innovation is decelerating, accelerating the diffusion of existing knowledge through media channels can enhance its utilization.

Moreover, our results suggest substantial untapped potential in disseminating underexploited discoveries, akin to "patent hunters" exploiting underutilized inventions to foster progress (Cohen et al., 2024). This dynamic parallels observations in technology markets, where the commercialization of ideas depends on factors such as market appropriability and the complementary assets held by incumbents (Gans and Stern, 2003). It also aligns with prior research showing how geographic proximity of inventors can influence patent citation rates and the dissemination of knowledge (Balsmeier et al., 2023).

In addition, press releases can further mitigate the impact of scientific "races," where teams working on similar discoveries may receive disproportionate credit based on slight differences in timing (Hill and Stein, 2025, 2024), coauthorship (Azoulay et al., 2010), eminent life scientists (Azoulay et al., 2019), novelty (Wang et al., 2017), or methodological approaches (Angrist et al., 2020). By focusing on mechanisms that enhance the spread of scientific knowledge, we contribute to the metascience discourse on optimizing the efficiency, attention, and equity of the scientific enterprise (Fortunato et al., 2018).

Finally, our study contributes to the fields of science communication and computational social science (Lazer et al., 2009) by highlighting the role of media channels in shaping the diffusion and impact of scientific knowledge. Prior research has demonstrated that scientific communication is pivotal in determining which ideas gain traction—not only within academia but also among policymakers, industry stakeholders, and the public. Our findings align with research from the computer science community on how communication networks and platforms (Wang et al., 2013; Shi et al., 2015), electronic access (Evans, 2008), and metaknowledge (Evans and Foster, 2011) influence the visibility and uptake of scientific ideas. By examining the interplay between press releases and citation patterns, we offer insights into how the strategic communication efforts of university press offices can expand the reach of scientific work. This, in turn, may help overcome barriers posed by the Matthew Effect, democratizing access to knowledge and opportunities within academia.

2 Setting

2.1 Scientific Communication

Scientific communication plays a crucial role in shaping public understanding, influencing policy decisions, and driving innovation. Effective communication is equally important within the scientific community itself. Ensuring that research is conveyed effectively is essential to maximizing its impact among both expert and public audiences (Jamieson, 2017).

For instance, on December 22, 1895, Wilhelm Röntgen took the first X-ray photograph. Röntgen, an introverted researcher who rarely attended conferences or published papers, benefited from a fortunate chain of events when the editor of Vienna's leading daily newspaper, Die Presse (The Press), saw the photograph and immediately changed the front-page story for the next day's issue. Published on January 6, 1896, under the headline "A Sensational Discovery," the article sparked widespread interest. Prominent German and British newspapers, such as the Daily Chronicle and the Standard, covered the story within days, ensuring Röntgen's findings had an unprecedented impact, marking one of the fastest diffusions of a scientific discovery before 1900.

By the end of the year 1896, over 1,000 books and papers had been published on X-rays and their applications, as scientists rushed to replicate and expand on his findings. That same year, German hospitals and private medical organizations began establishing X-ray institutes. Despite this explosion of interest, Röntgen himself published only two more papers on X-rays. Nevertheless, his discovery earned him the first Nobel Prize in Physics in 1901. The Nobel Foundation remarked: "A helping hand from the media: The world first discovered the sensational news that Wilhelm Röntgen's mysterious X-rays could penetrate clothing and human skin, not through scientists but through the press."

X-ray research has since become foundational in medicine and physics, contributing to numerous Nobel Prizes in fields such as crystallography and radiography. The Röntgen example underscores how broader communication of scientific discoveries can amplify their impact, shape careers, inspire breakthroughs, and novel lines of inquiry. Importantly, such scientific communication can sometimes help counteract the Matthew Effect by bringing attention to work that otherwise might have done unnoticed.

Therefore, it is crucial for universities and scientists, especially disadvantaged researchers, to have their work featured for a broader audience through the scientific press. Historically, journalists have faced significant challenges in accessing cutting-edge scientific developments within universities. To bridge this gap, universities began employing Press Information Officers to produce press releases and act as liaisons with journalists.

Figure 2 illustrates the translation process from an academic paper to a press release. On the left is the original scientific article, filled with highly specialized terminology that can be challenging for the public to fully understand. On the right, the corresponding press release "translates" the research into more accessible language. Key results are emphasized, along with the broader context of the study, its importance, and potential implications for both science and society. This transformation demonstrates how a press release can bridge the gap between complex scientific findings and a wider

audience, making specialized knowledge more comprehensible not only to the public, policymakers, and industry stakeholders but also to researchers from other fields. At the same time, it preserves the study's core messages and significance, which might otherwise remain obscured by technical details.

Before 1996, the system of distribution of press release was largely informal, with journalists relying heavily on personal connections with PIOs to stay informed about upcoming research. This dynamic shifted dramatically in 1996 with the launch of EurekAlert, which formalized and streamlined the process of disseminating press releases to journalists.

2.2 EurekAlert

EurekAlert was established by the American Association for the Advancement of Science. Since its inception, it has become the most prominent press-release distribution platforms, connecting the scientific community with journalists and the broader public. EurekAlert has expanded to include more than 14,000 journalists from more than 90 countries (as of early 2018), who rely on the platform for early access to scientific discoveries. Complementing this network, over 5,000 public information officers from 2,300 institutions regularly submit press releases, ensuring a constant stream of research findings across diverse scientific disciplines. The platform's significant traffic—exceeding 400,000 visits—underscores its extensive reach. EurekAlert's primary purpose is to centralize the dissemination of science-related news to journalists and promote the diffusion of scientific knowledge beyond academic audiences (Meredith, 2021). It is used by universities, academic journals, government agencies, and corporations to distribute press releases about scientific research, provided they meet specific standards. Notably, EurekAlert only accepts press releases related to peer-reviewed academic papers, and submissions must come from Press Information Officers representing organizations that conduct, publish, or fund scientific research.

Once a research paper is accepted for publication, the associated university or journal press office can post a press release on EurekAlert up to two weeks before the paper's official release. EurekAlert provides subscribing journalists with early access to these press releases, along with other embargoed research materials. This advance access allows journalists to prepare their stories, gather additional context—such as interviews with researchers or expert commentary—and ensure that the public is promptly informed about new scientific discoveries upon their release. Such timely dissemination is critical for enhancing the adoption and broader impact of the research (Burns et al., 2003).

2.3 University Press Information Office Congestion

When researchers at a university publish a high volume of articles, PIO congestion — i.e., the pool of potential articles available for promotion — naturally increases. This weekly variation in PIO workload is exogenous and independent of the quality of individual papers. Faced with capacity constraints, PIOs must selectively decide which papers to feature in press releases, prioritizing based on factors such as potential public interest, alignment with institutional goals, or perceived newsworthiness. However, these choices are driven more by practical limitations than by the intrinsic quality of the research itself.

Congestion within press offices is a critical factor, as PIOs have limited ability to "time-shift" their efforts to promote deserving papers during less busy weeks. Press releases are tied to journal embargoes and publication dates, leaving little flexibility in the promotional schedule. Consequently, the level of press office congestion at the time of publication directly impacts whether a paper receives media attention. Higher congestion reduces the likelihood that any given paper from that university will be featured in a press release. Even high-quality papers published during particularly congested weeks are less likely to be promoted, significantly diminishing their chances of gaining media coverage.

From an empirical standpoint, press office congestion offers a unique opportunity to examine the causal relationship between press releases and the diffusion of academic science. By using press office congestion as an instrumental variable, we can disentangle a paper's quality from its likelihood of receiving press coverage. This approach enables us to estimate the causal impact of press releases on the dissemination of scientific research while also providing insights into how media attention affects inequalities between advantaged and disadvantaged researchers.

3 Data

We collected archival data from EurekAlert covering the period from 1996 to mid-2021, encompassing over 300k press releases about peer-reviewed scientific papers from across the world. Each post contains rich metadata, including the press release text, details of the press officer, posting time, affiliations, and contact information. To extract critical information such as author names, organizational affiliations, journal titles, and paper titles, we applied advanced text analysis and data extraction techniques.

To link EurekAlert press releases to scientific articles, we matched this extracted information with publication data from OpenAlex, an open-source bibliometric database. Our sample focuses on academic papers in Biology, Chemistry, and Medicine, authored by researchers affiliated with the top U.S. universities and published in peer-reviewed journals between 1996 and 2020. The publication data includes the names and affiliations of authors, journal details, and an NLP-based classification of papers into specific concepts and fields. In total, the sample contains 2,298,945 research papers.

Using natural language processing (NLP) techniques, we matched scientific articles to their corresponding press releases on EurekAlert. The matching process involved comparing author names and affiliations from the press releases with those in OpenAlex. Given the large volume of publications and occasional inconsistencies in names formatting across the datasets, we leveraged the fact that press releases are typically embargoed until the associated paper is published. Press releases are often made public on the publication date of the paper, enabling us to use a 45-day window around the paper's publication date to identify relevant press releases. Through this matching process, we identified a total of 30,764 papers (approximately 1% of the OpenAlex sample) with an associated university press release [1].

Table 1 provides the summary statistics of our dataset, highlighting key characteristics of the papers

[1]While there are over 300k press releases, we restrict the matches to papers from top US universities and papers in fields of Biology, Medicine, and Chemistry which account for about 10% of press release data.

included in our analysis. Approximately 50% of the papers in the sample are from Medicine, 28% from Biology, and the remainder from Chemistry. Among these, 85% of papers received at least one citation. On average, papers in the dataset received 49 citations, with a median citation count of 18. Most papers were collaborative efforts, with an average of six co-authors per paper, and only 36% involved co-authors from the same university. The median tenure of the last authors, calculated as the difference between the publication date of the focal paper and their first published paper, is 19 years.

We categorized journals into four equally sized groups representing highest, high, medium, and low-ranked journals. Similarly, we divided the career stage of the last authors into three equally sized groups: early-career researchers, with 12 or fewer years of experience between the publication of the focal paper and their first published paper; mid-career researchers, with more than 12 but 24 or fewer years of experience; and late-career researchers, with more than 24 years of experience.

Our analysis reveals notable disparities in visibility between established researchers and those from underrepresented groups. Early-career researchers had 80% of their papers cited at least once, with an average of 41 citations. In contrast, mid-career and late-career researchers saw 86-87% of their papers cited at least once, with an average of 51-52 citations. Citation counts varied significantly by journal rank. Papers published in the highest-ranked journals received an average of 100 citations, far exceeding those published in lower-ranked journals, which averaged just 23 citations. Papers in high-ranked journals averaged 45 citations, while those in medium-ranked journals averaged 39 citations.

These disparities underscore the potential for press releases to act as a democratizing force in academia. Researchers in early career stages or publishing in lower-ranked journals face barriers to visibility, partly due to a lack of established networks or recognition by Press Information Officers. For instance, a new professor or junior academic may be less likely to receive press coverage, as PIOs may prioritize promoting work from researchers with whom they have established relationships or from more prestigious journals. By highlighting these gaps, we aim to investigate how press releases might reduce such inequalities by amplifying the visibility of underrepresented researchers and mitigating the systemic advantages held by established academics.

4 Empirical Design

A key challenge in evaluating the causal impact of press releases on citations lies in addressing the counterfactual: we cannot observe the number of citations a paper that received a press release would have garnered had it not been promoted. Conducting a large-scale field experiment where research papers are randomly selected for press releases is impractical. Moreover, identifying comparable treatment and control groups is infeasible, as higher-quality research is more likely to both receive press releases and accumulate citations. To overcome these challenges, we employ an instrumental variable (IV) approach to identify the causal effect of press releases on academic citations.

An effective IV requires an exogenous factor that influences whether a paper receives a press release but does not directly affect the number of citations it ultimately receives. In this study, we leverage the timing of paper publications as a source of exogenous variation. Specifically, the workload of a

university's press office—which fluctuates week by week—affects the likelihood of a paper being promoted. University Press Information Officers operate under capacity constraints, meaning that papers published during weeks of high academic publications are less likely to be featured in press releases, regardless of their quality. This phenomenon, which we term "Congestion Index," reflects the pool of potential articles available to a university press office in a given week for promotion. Weekly fluctuations in press office workloads due to variation in publication volumes across different departments at a university are independent of the quality of individual papers, providing a quasi-random source of variation in press release assignment.

To operationalize this, we construct a Congestion Index, which captures the press office workload relative to institutional characteristics, such as university size and average publication volume. This index serves as our instrumental variable, allowing us to isolate the causal effect of press releases on citation counts.

Our empirical analysis proceeds in two stages. In the first stage, we estimate the likelihood of a paper i, published in academic journal j in year y, month m, and week w, receiving a press release. The dependent variable, *Press Release*, is a binary indicator for whether a paper received a press release. The model includes observable characteristics of the paper, such as the number of authors and the number of unique affiliations, as covariates. To control for differences across fields, journals, and time periods that could influence both press coverage and citations, we include fixed effects for field-year, journal-year, and year-month. The key explanatory variable is the Congestion Index, which captures exogenous variation in press office workloads:

$$PressRelease_{ifuw} = \alpha \times Congestion\ Index_{ifw} + \text{FE}_{jy} + \text{FE}_{fy} + \text{FE}_{ym} + X_i + \varepsilon_{ifuw} \tag{1}$$

In the second stage, we use the predicted values of the endogenous variable Press Release (from the first stage) to estimate its effect on the outcome variable, citations. The dependent variable, citations, is the total number of citations the article received.

$$Citations_{ifuw} = \beta \times \widehat{Press\ Release}_{ifuw} + \text{FE}_{jy} + \text{FE}_{fy} + \text{FE}_{ym} + X_i + \epsilon_{ifuw} \tag{2}$$

By leveraging the quasi-random variation introduced by PIO congestion, this approach allows us to disentangle the effects of press releases from other confounding factors, enabling us to estimate their causal impact on the diffusion of scientific research.

5 Results

5.1 Press Releases and Press Office Congestion

To better understand the impact of press releases on the diffusion of scientific research, we provide descriptive insights by comparing two papers authored by the same researchers at the same university (University of Illinois Urbana-Champaign), on the same topic (Advanced biosensing and bioanalysis

techniques), within the same subfield (Molecular Biology) and domain (Life Sciences), and published in the same journal (Journal of the American Chemical Society) within a short period of less than six months. One paper coincidentally fell into a week of high congestion at the university's press office and did not receive a press release (Liu and Lu, 2002), while the other was published during a week of low congestion and was promoted through a press release (Liu and Lu, 2003). The paper that benefited from the press release (1237 citations) received approximately 10 times more citations than its counterpart (121 citations). This striking difference provides qualitative support for the notion that press releases significantly enhance the visibility and impact of scientific work.

Building on our hypothesis, we first investigate whether the number of papers published by scientists at a university at any given time significantly influences the selection pool for press releases managed by press officers. To explore this, we examine the relationship between congestion (measured as the normalized total number of papers published in the same week for each university, adjusted yearly to account for variations in PIO workload) and the likelihood of a paper receiving a press release. This relationship is illustrated in Figure 1. Panel 1a displays the unadjusted relationship between press release likelihood and congestion, while Panel 1b presents the adjusted relationship after accounting for Year-Month, Journal-Year, and Field-Year fixed effects. The adjusted model incorporates controls for several key factors, including the number of co-authors, the number of unique university affiliations among co-authors, and prior press release coverage by the team of authors, measured as the maximum press release coverage received by any co-author of the focal paper in the previous calendar year. Both figures reveal a consistent and robust pattern: papers published during weeks of higher congestion are significantly less likely to be featured in a press release.

Table 2 shows the first stage relationship between the congestion index and the likelihood of receiving a press release. In this analysis, we regress Press Release on the Congestion Index, including controls for the number of co-authors, the number of unique university affiliations among co-authors, and prior press release coverage of the team of authors. Fixed effects for Year-Month, Field-Year, and Journal-Year are also included to account for temporal, disciplinary, and journal-specific heterogeneity. The results indicate that the congestion index has a statistically significant negative effect on the likelihood of a paper being issued a press release. Additionally, the F-statistic reinforces the strength of the congestion index as a predictive tool for press release likelihood. This relationship holds consistently across different fields, including biology, chemistry, and medicine.

5.2 Attention and Diffusion through Press Releases

Before analyzing how press releases influence gaps between elite and non-elite researchers, we first evaluate their overall impact on citation counts. Specifically, we test our central assumption that press releases significantly boost the visibility and diffusion of scientific research. To do so, we employ a two-stage least squares (2SLS) instrumental variable (IV) analysis. In the first stage, this approach estimates the likelihood that a paper receives a press release, using the Congestion Index as an instrument. This index captures exogenous variation in press office workloads during the week of its publication. The dependent variable, Press Release, is a binary indicator of whether a paper recieved an official press release on EurekAlert. Observable characteristics, such as the number of

authors and institutional affiliations, are included as controls, along with fixed effects for field-year, year-month, and journal-year in the regressions. In the second stage, the predicted likelihood of a press release is used to estimate its causal effect on the dependent variable, Citations.

Columns 2 and 3 (adding journal-year fixed effects) of Table 2 summarize the results of our analysis. The estimates reveal a substantial positive causal effect of press releases on total citation counts, with papers that received a press release gaining, on average, about 928 more citations. These findings demonstrate the critical role press releases play in enhancing the visibility and diffusion of scientific ideas.

The effects of press releases on citation counts are consistent across scientific disciplines. The promotional benefits of press releases are robust across biology, chemistry, and medicine, indicating their broad applicability. These findings suggest that the role of press releases in amplifying the diffusion of research is not confined to specific fields but extends to a wide range of scientific domains.

Recognizing the potential influence of collaborative authorship across institutions, we restricted our analysis to papers authored by teams from a single university. Even within this subset, as presented in the Appendix A2, the 2SLS estimates remain positive and significant, reinforcing the conclusion that press releases are instrumental in the diffusion and uptake of scientific knowledge. We perform additional robustness check for transformations of the outcome variable and present the results in Appendix A3 which show a strong positive relationship between press release coverage and citations. These robustness checks confirm that our findings are not sensitive to model specifications or methodological assumptions. By demonstrating the consistent and substantial impact of press releases on citation outcomes, our analysis underscores the crucial role of strategic science communication in amplifying the visibility of research.

5.3 Democratizing Role of Press Releases

But who benefits most from the additional visibility afforded by press releases? To address this question, we examine whether EurekAlert posts reinforce existing inequalities or contribute to democratizing the diffusion of scientific knowledge, particularly by amplifying the work of disadvantaged researchers.

We define "disadvantage" in terms of two key dimensions: journal rank and career stage. These measures capture distinct barriers researchers face in achieving visibility for their work. Papers published in lower-ranked journals often struggle to gain attention despite potentially high-quality findings. While high-ranking journals naturally provide a platform for diffusion, lesser-known outlets may contain equally impactful research that risks going unnoticed without additional promotion. Early-career researchers typically lack the reputational capital and extensive networks that senior academics enjoy. Promoting their work can disrupt the cycle of low visibility, which perpetuates inequalities in scientific attention.

These dimensions are not only relevant but critical to understanding how scientific visibility is distributed. High-quality research is not confined to elite journals nor is it exclusively the domain of senior researchers. By examining these dimensions, we aim to determine whether press releases dis-

proportionately benefit researchers from underrepresented groups, thereby counteracting entrenched academic inequalities.

Our analysis reveals substantial heterogeneity in the impact of press releases on citation counts (Tables 3 and 4). Rather than widening pre-existing gaps, our findings suggest that press releases have a democratizing effect, reducing inequalities in scientific visibility.

Figure 3a demonstrates that press releases offer pronounced benefits to early-career researchers. Papers with early-career last authors experience an almost 2-fold larger increase in citations following a press release compared to those authored by late-career researchers. This finding highlights the importance of press releases in supporting emerging researchers as they seek to establish themselves in competitive academic environments.

As shown in Figure 3b papers published in highest-ranked journals experience a smaller proportional increase in citations following a press release compared to those in high-, medium-, or low-ranked journals. Specifically, press-released papers in medium- or low-ranked journals are associated with an average of 1.6- and 5.4-fold increases in citations, respectively, compared to those in high-ranked journals. This suggests that while top-tier journals inherently provide significant visibility, press releases disproportionately benefit papers in lesser-known journals by amplifying their reach and impact. These findings underscore the democratizing potential of press releases to spotlight high-quality work published outside elite outlets.

6 Conclusion

This study makes a key contribution to the field of science communication by addressing the lack of causal evidence on the impact of media in the diffusion of science. By establishing the causal relationship between press releases and citation outcomes, we provide robust empirical evidence underscoring the critical role press releases play in shaping the visibility and impact of scientific work. Our findings also highlight their potential to counterbalance the structural inequalities that affect access to resources and attention in science. Leveraging natural variation in university press office workloads, we contribute to the science of science literature by developing a novel dataset. Employing an innovative instrumental variable approach, we isolated the causal impact of press releases on citation counts, demonstrating their significant influence in amplifying the diffusion of scientific knowledge.

Papers that received a press release on EurekAlert experienced a substantial increase in citation rates. These findings reveal that press releases are not merely a mechanism for disseminating research but are also strategic tools for enhancing the visibility of scientific work both within and beyond the academic community.

The scientific community is characterized by profound disparities, with elite institutions and well-resourced researchers capturing a disproportionate share of attention, citations, and resources. This dynamic perpetuates the Matthew Effect, wherein those with initial advantages continue to accumulate further attention, while marginalized researchers struggle to gain visibility. Our analysis demonstrates

that the benefits of press releases are not uniformly distributed across the scientific community. Instead, press releases play a democratizing role by disproportionately benefiting early-career researchers and scholars publishing in lower-ranked journals. These groups, often marginalized by the self-reinforcing cycle of scientific inequality, gain greater academic visibility through press releases, suggesting that media attention can help mitigate some of the disparities perpetuated by the Matthew Effect.

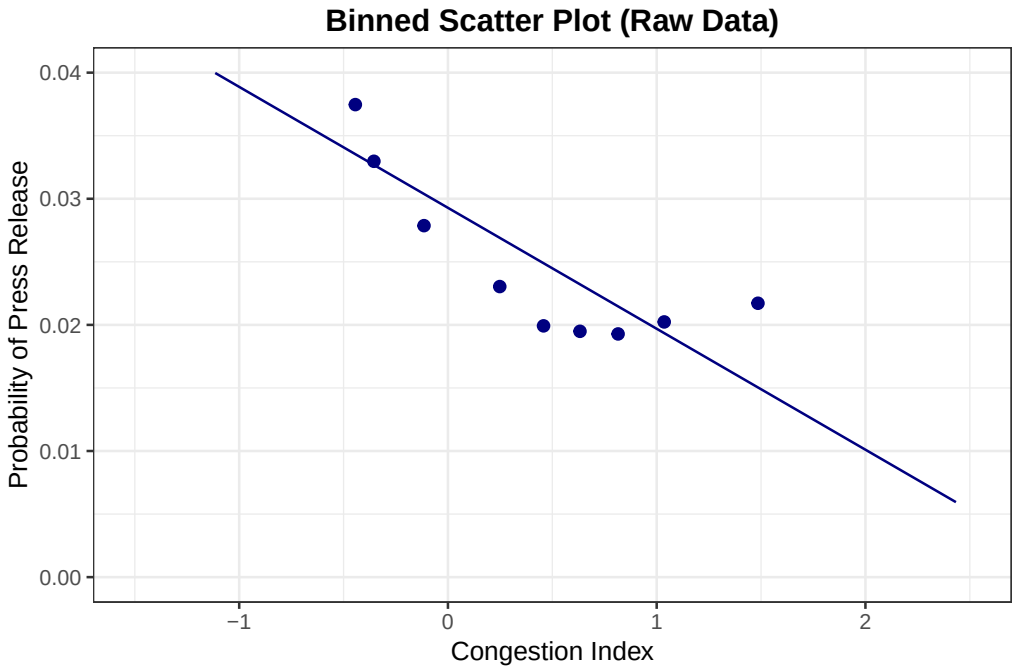
While press releases can help narrow visibility gaps, they are not a panacea for the broader systemic inequities in science. Attention alone cannot resolve all the barriers faced by marginalized researchers, but it can play a crucial role in amplifying under-recognized work and fostering a more inclusive scientific discourse. By providing a clearer understanding of how strategic communication through press releases influences citation patterns and contributes to a more equitable distribution of attention, our study adds to the broader conversation on addressing inequalities in the scientific community. In a world where the pace of scientific innovation is often constrained by structural barriers, accelerating the diffusion of knowledge through media channels offers significant potential to enhance scientific progress and democratize opportunities for all researchers.

Finally, we acknowledge some limitations of our study. First, while we observe and analyze the impact of press releases, we cannot directly measure the actual media coverage or public attention these press releases generate. Second, qualitative differences in the content and quality of press releases may affect their effectiveness in attracting attention and citations. Future research could address these limitations by incorporating direct measures of media coverage and exploring how variations in press release quality influence outcomes. Despite these limitations, our findings underscore the power of strategic communication in fostering a more inclusive and equitable scientific ecosystem by amplifying under-recognized work and enabling talented researchers to gain the recognition they deserve.

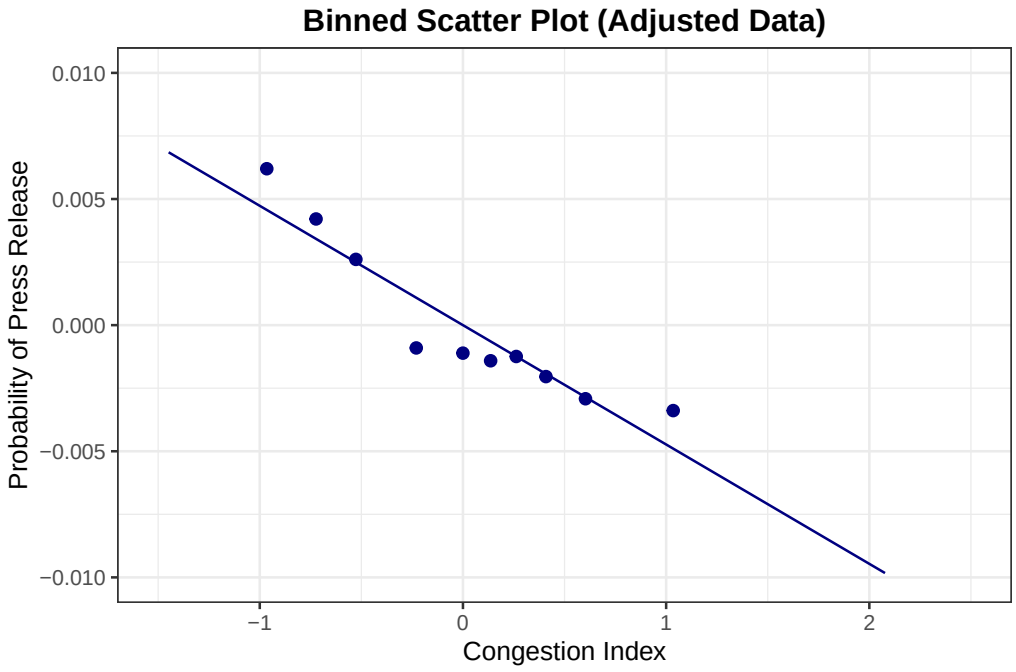
7 Figures

Figure 1: First Stage Relationship

(a)

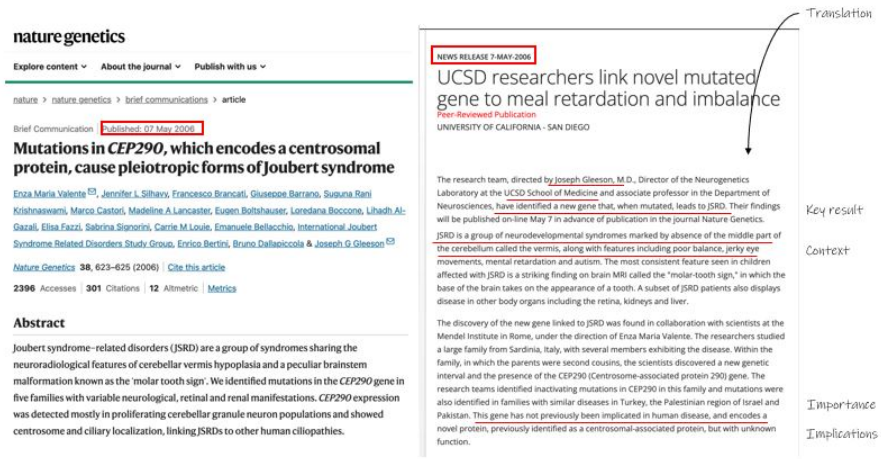


(b)



Note: Panel (a) represents the unadjusted relationship between the variables, while panel (b) shows the adjusted relationship accounting for fixed effects and controls. The figures show a negative relationship between *Congestion Index* (instrument variable) and the likelihood of papers receiving a press release (dependent variable).

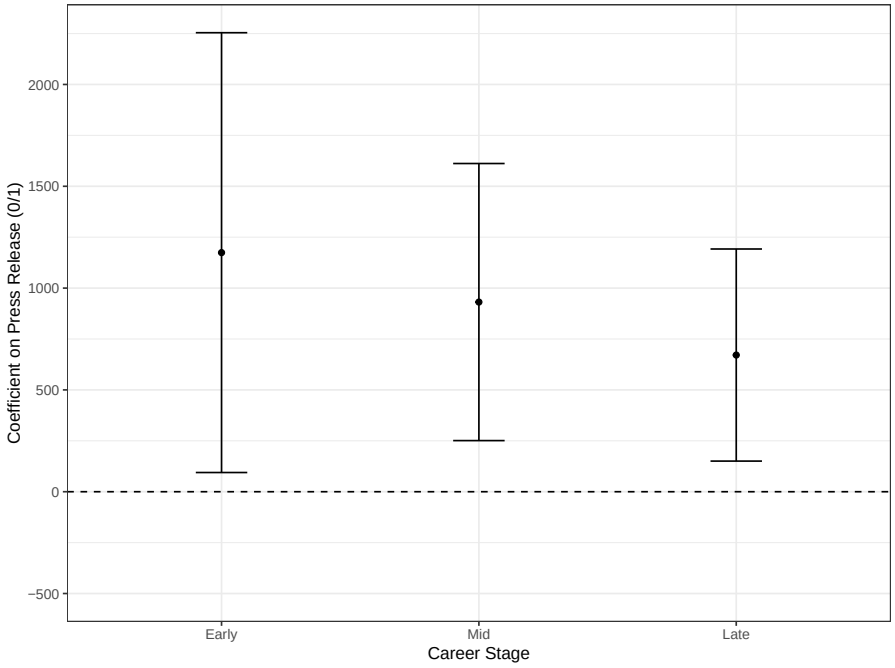
Figure 2: Transformation from an original scientific article to a press release



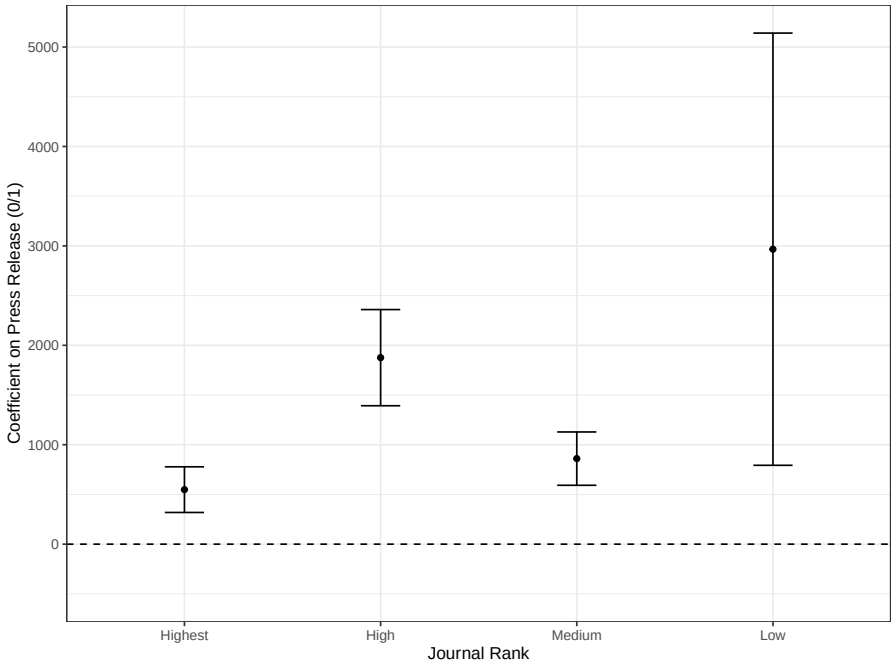
Notes: The figure illustrates the translation process undertaken by university PIOs, showing the transformation from an original scientific article (left) to a press release (right).

Figure 3: Effect of University Press Release on Citations moderated by Career Stage and Journal Rank

(a) Effect of University Press Release on Citations moderated by Career Stage of the Last Author



(b) Effect of University Press Release (0/1) on Citations moderated by Journal Rankings



Notes: The figure presents heterogeneity results. The effect of press releases is higher during the early career stage (Panel a). Papers published in the highest-ranked journals experience a relatively smaller increase in citations compared to those in medium- and low-ranked journals (Panel b).

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8 Tables

Table 1: Summary Statistics

Statistic	N	Mean	St. Dev.	Median	Min	Max
Press Release (0/1)	2,298,945	0.01	0.11	0	0	1
Any Cites (0/1)	2,298,945	0.85	0.36	1	0	1
Total Citations	2,298,945	48.80	180.63	18	0	133,770
Congestion Index	2,298,945	0.31	0.67	0.33	-1.26	7.79
# of Affiliations	2,298,945	2.62	2.50	2	1	82
# of Authors	2,298,945	6.02	4.71	5	1	200
Author PR Mentions$_{y-1}$	2,298,945	0.11	0.43	0	0	15
Last Author Tenure	2,298,945	19.76	12.64	19	0	70

Note: The observations are at paper level and include papers from 97 US universities published between 1996 and 2020.
Press Release is a binary variable indicating whether the paper received a press release from a university press office or not. *Any Citation* indicates whether the paper received any citations. *Total Citations* and *Log(Citations+1)* capture the citations received. *Congestion Index* is the instrument variable capturing how busy the press offices were during the week the paper was published. *# of Authors* is the count of authors of the focal paper. *# of Affiliations* is the count of the number of unique universities that the authors are affiliated with. *Author PR Mentions*$_{y-1}$ is a measure of press release coverage by the team of authors in the previous year. It is operationalized as the maximum coverage received by any authors in the last calendar year. *Last Author Tenure* is computed as the difference (in years) between the date of publication of the last author's first paper and the date of publication of the focal paper.

Table 2: Effect of Press Release on Citations

	First Stage	2SLS	
Dependent Variables:	Press Release (0/1)	Total Citations	
Model:	(1)	(2)	(3)
Variables			
Press Release (0/1)		1,431***	928***
		(76.79)	(212.82)
Congestion Index	-0.0013***		
	(0.0002)		
# of Authors	0.0012***	-0.3310*	1.0316***
	(0.0000)	(0.1742)	(0.2484)
# of Affiliations	-0.0020***	5.9754***	4.1617***
	(0.0001)	(0.2727)	(0.4517)
Author PR Mentions$_{y-1}$	0.0196***	-23.5232***	-12.6216***
	(0.0005)	(2.0442)	(4.2316)
Fixed-effects			
Field-Year	✓	✓	✓
Year-Month	✓	✓	✓
Journal-Year	✓		✓
Fit statistics			
Observations	2,298,945	2,298,945	2,298,945
F-test (1st stage), Press Release (0/1)		1,384.1	67.92

Clustered (YW) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Model (1) shows the first stage results of the impact of congestion index (instrument variable) on the likelihood of a paper receiving a press release. Models (2) and (3) show the 2SLS result of the impact of press release on citation counts using congestion index as the instrumental variable.

Table 3: Career Heterogeneity: Effect of Press Release by Career Stage

Dependent Variable:	Total Citations		
Career Stage:	Early-Career	Mid-Career	Late-Career
Variables			
Press Release (0/1)	1,174.21**	931.39***	671.15**
	(551.01)	(347.14)	(265.72)
# of Affiliations	3.55***	4.09***	4.18***
	(0.72)	(0.83)	(0.65)
# of Authors	1.28***	1.23***	1.07***
	(0.40)	(0.40)	(0.41)
Author PR Mentions$_{y-1}$	-16.56*	-13.70*	-7.21
	(9.65)	(7.30)	(5.36)
Fixed-effects			
Year-Month	✓	✓	✓
Field-Year	✓	✓	✓
Journal-Year	✓	✓	✓
Mean Citations	41.0	52.3	51.8
Fit statistics			
Observations	682,462	849,348	767,135

Clustered (YW) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

The table presents the impact of press releases on academic citations, categorized by the career stage of the last author: *early*, *mid*, and *late* career. The effect of press releases is strongest for papers authored by *early-career* last authors and weakest for those with *late-career* last authors.

Table 4: Journal Prestige: Effect of Press Release on Citations by Journal Rank

Dependent Variable:	Total Citations			
Journal Rank:	Highest	High	Medium	Low
Variables				
Press Release (0/1)	548.52***	1,875.96***	860.49***	2,966.80***
	(117.17)	(246.75)	(136.82)	(1,108.97)
# of Affiliations	6.67***	5.67***	3.38***	2.75***
	(0.68)	(0.35)	(0.25)	(0.54)
# of Authors	1.77***	-0.80***	-0.23	-0.26
	(0.42)	(0.18)	(0.15)	(0.36)
Author PR Mentions$_{y-1}$	-3.95	-24.58***	-8.29***	-28.08**
	(4.03)	(4.13)	(2.07)	(12.04)
Fixed-effects				
Year-Month	✓	✓	✓	✓
Field-Year	✓	✓	✓	✓
Mean Citations:	100	44.8	39.3	23.4
Fit statistics				
Observations	497,225	495,016	499,372	497,547

Clustered (YW) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

The table presents the impact of press releases on academic citations, categorized by journal rank: *highest*, *high*, *medium*, and *low* based on the Impact per Publication (IPP), a metric used to rank journals based on the number of citations they receive for publications in previous three years. The results indicate that the effect of press releases is lowest for journals in the *highest* rank category.

9 Appendix

Table A1: First Stage: Effect of Press Office Congestion on the Likelihood of Receiving a Press Release

Dependent Variable:	Press Release (0/1)			
Model:	(1)	(2)	(3)	(4)
Variables				
Congestion Index	-0.0033***	-0.0030***	-0.0046***	-0.0013***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
# of Authors		0.0024***	0.0023***	0.0012***
		(0.0000)	(0.0000)	(0.0000)
# of Affiliations		-0.0028***	-0.0025***	-0.0020***
		(0.0001)	(0.0001)	(0.0001)
Author PR Mentions$_{y-1}$		0.0251***	0.0246***	0.0196***
		(0.0006)	(0.0006)	(0.0005)
Fixed-effects				
YM	✓	✓	✓	✓
FieldYear			✓	✓
JournalYear				✓
Fit statistics				
Observations	2,298,945	2,298,945	2,298,945	2,298,945

Clustered (YW) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table A2: Effect of Press Release on Citations for Papers Written by Co-authors at the Same University

Dependent Variable:	Total Citations
Model:	(1)
Variables	
Press Release	1,449.70***
	(407.10)
# of Authors	-0.76
	(0.94)
Author PR Mentions$_{y-1}$	-18.58***
	(6.80)
Fixed-effects	
Year-Month	✓
FieldYear	✓
JournalYear	✓
Fit statistics	
Observations	802,257

Clustered (YW) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table A3: Robustness: Effect of Press Release on Citations

Dependent Variables:	Any Cite (0/1)	Log(Cites+1)	asinh(Cites)	log(Cites) | Cites>0	asinh(Cites) | Cites>0
Variables					
Press Release (0/1)	13.27***	55.00***	64.57***	29.08***	28.02***
	(1.89)	(7.59)	(8.91)	(4.57)	(4.41)
# of Authors	-0.01***	-0.03***	-0.04***	0.00	0.00
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
# of Affiliations	0.03***	0.14***	0.16***	0.09***	0.08***
	(0.00)	(0.02)	(0.02)	(0.01)	(0.01)
Author PR Mentions$_{y-1}$	-0.25***	-1.00***	-1.18***	-0.57***	-0.55***
	(0.04)	(0.15)	(0.18)	(0.10)	(0.10)
Fixed-effects					
Year-Month	✓	✓	✓	✓	✓
Field-Year	✓	✓	✓	✓	✓
Journal-Year	✓	✓	✓	✓	✓
Fit statistics					
Observations	2,298,945	2,298,945	2,298,945	1,950,075	1,950,075

Clustered (YW) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*