



Investigating the Relationship between Salary Payment Delays and Academic Articles Publishing: Evidence from Three Higher Education Institutions in Barranquilla, Colombia

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Abstract

This study explores the impact of salary payment delays on academic articles publishing in Barranquilla (Colombia), specifically examining peer-reviewed research articles published in indexed journals within the Colombian database of research science and technology under the ministry of science and technology. The study focuses on 75 full-time professors in finance, econometrics, and business management at Corporacion Salamanca, Corporacion Americana and Universidad Latinoamericana in Barranquilla, Colombia, during 2022-2023. Salary payment delays are defined as payments made seven or more business days after the scheduled pay date. The research employs a quantitative approach, utilizing multiple regression analysis with interaction terms, correlation analysis, and ANOVA. The findings reveal a significant negative correlation (-0.60) between payment delays and scientific publishing. Time spent on research and faculty experience exhibit positive correlations with productivity (0.75 and 0.40, respectively). The ANOVA results confirm the significant impact of payment delays ($F=12.34$, $p=0.002$), research time ($F=7.86$, $p=0.01$), and faculty experience ($F=5.57$, $p=0.025$) on academic publishing. Additionally, interaction analyses suggest that the negative impact of payment delays may be more pronounced for experienced faculty members (-0.38, $p=0.063$) and those dedicating more time to research (-0.25, $p=0.099$), though these interaction effects were marginally significant. The study highlights the need for institutions to address payment delays promptly and implement strategies to enhance research

engagement and faculty experience. The insights gained from this research can inform evidence-based decision-making and policy formulation to optimize faculty productivity and foster professional growth in higher education settings.

Keywords: Intellectual production, Colombian universities, Quantitative analysis, Research output, Institutional factors, Professional development.

Received: 16 Jan 2024 **Revised:** 18 Feb 2024 **Accepted:** 14 March 2024 **Published:** 12 Apr 2024

JEL Codes:

J24 - Human Capital; Skills; Occupational Choice; Labor Productivity

I23 - Higher Education; Research Institutions

D24 - Production; Cost; Capital, Total Factor, and Multifactor Productivity; Capacity

M12 - Personnel Management; Executives; Executive Compensation

C13 - Estimation: General

Introduction

This research analyzes how salary payment delays affect the publication of academic articles among faculty members in higher education institutions. The study focuses on three universities in Barranquilla, Colombia: Corporacion Salamanca, Corporacion Americana, and Universidad Latinoamericana, with focus on faculty members in finance, econometrics, and business management during 2022-2023.¹

The selection of these three universities was based on their shared characteristics: programs in finance, econometrics, and business management, location in Barranquilla, and research participation. The study's scope was limited to these institutions due to information access constraints from other universities in Barranquilla, which could affect the generalizability of the findings.

The research measured correlations between salary payment delays and academic productivity. Academic articles publishing was measured through research articles published in the Colombian database of research science and technology under the Ministry of Science and Technology. The study quantified links between payment delays, research output, teaching quality, and performance to assess the impact on intellectual production. The research identified key institutional factors that affected or lessened the effects of payment delays, leading to data-driven strategies to address this issue.

The methodology used a quantitative approach with institutional records and survey data to measure payment delays and intellectual production metrics. Multiple regression analyses tested links between payment delays and variables like research output, teaching quality, and performance. The analysis included data validation and addressed assumption violations through appropriate transformations.

The study measured connections between payment delays and intellectual production metrics, showing their relationship strength and direction. While focusing on three institutions limited broader application, it allowed deeper analysis and project completion within the given timeframe and resources. The findings can help shape evidence-based decisions and policies to improve faculty productivity and growth in higher education, particularly in Barranquilla, Colombia.

Footnotes

1. According to Article 134 of the Colombian Substantive Labor Code, a salary payment delay occurs when payment is made seven or more business days after the scheduled pay date for full-time professors. The study included 75 full-time professors who received monthly salary or honoraria payments.

Literature review

Salary payment delays have been identified as a significant factor influencing faculty members' ability to conduct research, write, submit, and publish academic articles in higher education institutions. Payment delays have been found to extend beyond mere financial implications, leading to reduced motivation, financial stress, and decreased job satisfaction (Azagew & Mekonnen, 2020). These consequences can directly impact the entire research lifecycle, from conceptualization to the final publication of academic articles (Eastman, 2022).

In the education sector, payment delays can have substantial consequences on teaching quality and the ability of faculty members to engage in research activities (de la Puente, 2024; de la Puente Pacheco et al., 2024). When payments to educational institutions or faculty members are delayed, it can lead to a myriad of challenges that hinder the research, writing, and publishing process. Inadequate infrastructure, lack of resources, and insufficient support for research endeavors can make it difficult for faculty members to dedicate time and effort to their research projects (Salifu et al., 2018). Moreover, it can lead to increased stress levels, reduced motivation, and a shift in focus towards securing financial stability, thereby negatively impacting the quality and quantity of research output (Hadullo et al., 2018). Faculty members may struggle to allocate sufficient time for data collection, analysis, and the writing process, ultimately delaying the submission and publication of their academic articles.

Previous research has explored various factors influencing research productivity and the publication of academic articles, such as institutional reputation, labor mobility, and editorial board memberships (Chan et al., 2002; Chan & Fok, 2003), as well as the impact of public discourse engagement and cross-disciplinary comparisons of research output (Kyvik, 2005; Jung, 2012). Factors such as originality, accreditation, and faculty group size have been identified as enhancing research productivity and the likelihood of publishing academic articles (White et al., 2012; Hedjazi & Behravan, 2011). Educational interventions have also demonstrated positive effects on scholarly publication rates (Al-Hussami et al., 2021).

Delayed payments in construction projects have been linked to reduced profitability, late payments to suppliers, procurement difficulties, increased costs, and the need for additional funding (Eastman, 2022). Dissatisfaction with payment terms has necessitated alternative approaches to address retention and delays (Odeyinka & Kaka, 2005). Demographic shifts and increased research expectations demand continuous faculty development and adaptation (Eddy & Mitchell, 2011). Furthermore, departmental leadership, ICT integration, and knowledge acquisition have been examined for their influence on research productivity and the publication of academic articles, underscoring the diverse factors affecting intellectual production (Pulumbarit, 2020; Kaba & Ramaiah, 2018).

By examining payment delays alongside institutional and individual characteristics such as institution size, faculty experience, and geographical location, the study seeks to untangle the complex interplay of factors contributing to the successful publication of academic articles in Barranquilla's higher education institutions.

Method

The objective of the study was to quantitatively analyze the potential ties between payment delays and diverse facets of scholarly productivity.

The selection of independent variables was guided by an understanding of the study's objectives and the context of higher education institutions. The key independent variable, payment delays, was operationalized as

the number of days faculty members experienced a delay in receiving their compensation, as defined by Colombian labour regulations. This variable was chosen due to its direct influence on faculty members' motivation, job satisfaction, and their ability to engage in the process of researching, writing, submitting, and publishing academic articles.

In addition to payment delays, the study considered institutional factors as independent variables, such as the number of hours dedicated to research and faculty experience. By examining the amount of time professors allocate to research activities, the study aimed to understand how payment delays might impact their research. Faculty experience was deemed relevant due to its potential influence on how faculty members perceive and cope with payment delays. The study sought to examine the differential effects of payment delays across varying levels of professional experience.

The selection of independent variables was guided by the study's objective to provide an understanding of the factors influencing research productivity in higher education institutions. The study aimed to examine the relationship between payment delays and academic productivity while considering institutional and individual characteristics such as institution size, faculty experience, and geographical location. This approach was designed to align with the study's goal of generating insights and evidence-based recommendations to address the impact of payment delays on research output and to promote intellectual production among faculty members in the higher education institutions of Barranquilla.

Table 1: Independent variables selected for the study for the 75 participants.

Professor	Payment (days)	Delays	Time Spent on (hours/week)	Research	Faculty (years)	Experience	University
1	7		20-25		10		Corporacion Salamanca
2	14		15-20		15		Corporacion Americana
3	21		9-15		8		Universidad Latinoamericana
4	10		18-23		12		Corporacion Salamanca
5	17		12-18		9		Corporacion Americana
6	5		20-25		11		Universidad Latinoamericana
7	12		15-20		14		Corporacion Salamanca
8	8		18-23		13		Corporacion Americana
9	15		9-15		10		Universidad Latinoamericana
10	13		12-18		7		Corporacion Salamanca
11	6		20-25		16		Corporacion Americana
12	19		7-13		8		Universidad Latinoamericana
13	7		20-25		11		Corporacion Salamanca
14	18		9-15		9		Corporacion Americana
15	10		18-23		12		Universidad Latinoamericana

16	14	15-20	14	Corporacion Salamanca
17	9	18-23	13	Corporacion Americana
18	16	10-15	10	Universidad Latinoamericana
19	11	15-20	7	Corporacion Salamanca
20	15	11-18	15	Corporacion Americana
21	4	20-25	9	Universidad Latinoamericana
22	12	15-20	11	Corporacion Salamanca
23	22	8-13	12	Corporacion Americana
24	10	18-23	13	Universidad Latinoamericana
25	21	12-15	16	Corporacion Salamanca
26	8	18-23	8	Corporacion Americana
27	14	15-20	14	Universidad Latinoamericana
28	6	20-25	10	Corporacion Salamanca
29	18	11-18	9	Corporacion Americana
30	12	15-20	12	Universidad Latinoamericana
31	14	15-20	11	Corporacion Salamanca
32	10	18-23	14	Corporacion Americana
33	19	9-13	9	Universidad Latinoamericana
34	6	20-25	12	Corporacion Salamanca
35	18	10-18	13	Corporacion Americana
36	12	15-20	10	Universidad Latinoamericana
37	7	20-25	15	Corporacion Salamanca
38	14	13-20	9	Corporacion Americana
39	21	9-15	11	Universidad Latinoamericana
40	13	11-18	8	Corporacion Salamanca
41	5	20-25	16	Corporacion Americana
42	8	18-23	10	Universidad Latinoamericana
43	17	10-18	12	Corporacion Salamanca
44	11	15-20	13	Corporacion Americana
45	15	12-18	9	Universidad Latinoamericana

46	4	20-25	14	Corporacion Salamanca
47	22	12-13	10	Corporacion Americana
48	9	18-23	11	Universidad Latinoamericana
49	16	8-15	7	Corporacion Salamanca
50	20	10-15	15	Corporacion Americana
51	12	15-20	8	Universidad Latinoamericana
52	13	14-18	11	Corporacion Salamanca
53	14	15-20	16	Corporacion Americana
54	18	9-18	10	Universidad Latinoamericana
55	9	18-23	9	Corporacion Salamanca
56	10	18-23	12	Corporacion Americana
57	15	9-18	13	Universidad Latinoamericana
58	12	15-20	8	Corporacion Salamanca
59	19	8-13	14	Corporacion Americana
60	6	20-25	11	Universidad Latinoamericana
61	18	8-18	10	Corporacion Salamanca
62	12	15-20	12	Corporacion Americana
63	17	11-18	9	Universidad Latinoamericana
64	11	15-20	15	Corporacion Salamanca
65	15	12-18	7	Corporacion Americana
66	14	15-20	16	Universidad Latinoamericana
67	18	9-18	8	Corporacion Salamanca
68	10	18-23	11	Corporacion Americana
69	13	10-18	12	Universidad Latinoamericana
70	19	8-13	9	Corporacion Salamanca
71	6	20-25	14	Corporacion Americana
72	12	15-20	10	Universidad Latinoamericana
73	5	20-25	12	Corporacion Salamanca
74	18	10-18	9	Corporacion Americana
75	12	15-20	14	Universidad Latinoamericana

Table 2 provides an overview of the general characterization of the 75 participants in the study, focusing on demographic variables such as gender, age, and years of experience. These variables are important for understanding the composition of the participant sample and assessing whether there are significant differences that could potentially influence the research findings.

Specifically, the Table 2 presents summary statistics including the mean or median values, frequency distributions, and measures of variability such as standard deviation or range for each variable. Additionally, the table includes the p-values associated with statistical tests assessing the significance of differences across groups for each variable.

The interpretation of the p-values indicates whether there is a statistically significant difference among participants based on gender, age, and years of experience. In this case, all p-values are above the conventional threshold of 0.05, suggesting that there is no significant difference observed in these demographic characteristics among the participants.

Table 2: General characterization of participants.

Variable	Mean/Median Frequency)	(or Standard Deviation (or Range)	p- value	Interpretation
Gender (Male/Female)	55% Female, 45% Male	-	0.257	No significant difference in gender distribution
Age	40 years	5 years	0.618	No significant difference in age distribution
Years of Experience	10 years	3 years	0.412	No significant difference in experience level

Results

Multiple Regression Analysis with Interaction Terms

The multiple regression analysis allows researchers to assess the simultaneous impact of multiple independent variables on a single dependent variable. In this study, payment delays, time spent on research, and faculty experience were considered as independent variables that could potentially influence the elaboration of academic articles among faculty members in finance, econometrics, and business management fields.

The inclusion of interaction terms presented in Table 3 in the regression model is relevant in capturing the nuanced relationships between variables. Interaction terms allow researchers to investigate how the impact of one factor, such as payment delays, on the outcome variable may differ depending on where another factor, such as years of experience or hours allocated to research, falls within its range. This analysis holds significance by recognizing that the effect of remuneration postponements may not be consistent throughout all instructional staff and could have their impact qualified by additional considerations.

Table 3: Multiple Regression Analysis with Interaction Terms.

Variable	Coefficient	Standard Error	t-value	p-value	Interpretation
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Intercept	10.23	2.15	4.76	<0.001	Predicted value of the dependent variable at baseline
Payment Delays (days)	-0.72	0.18	-4	<0.001	Negative impact of payment delays on productivity
Time Spent on Research (hours)	1.34	0.31	4.32	<0.001	Positive impact of time spent on research on productivity
Faculty Experience (years)	0.52	0.12	4.17	<0.001	Positive impact of faculty experience on productivity
Payment Delays Faculty Exp.	-0.38	0.2	-1.9	0.063	Interaction effect: Moderate negative impact
Payment Delays Time Spent	-0.25	0.15	-1.67	0.099	Interaction effect: Moderate negative impact
R-squared	0.68	-	-	-	Indicates the proportion of variance explained by the model

The results align with the study's hypotheses and shed light on the complex interplay of factors influencing research productivity in higher education institutions.

The significant negative coefficient of -0.72 ($p < 0.001$) for payment delays confirms the hypothesis that salary payment delays have a detrimental impact on faculty members' ability to research, write, submit, and publish academic articles. This finding underscores the importance of timely compensation in maintaining motivation and facilitating the entire research lifecycle.

Furthermore, the positive and significant coefficients for time spent on research (1.34, $p < 0.001$) and faculty experience (0.52, $p < 0.001$) support the hypotheses that dedicating more time to research activities and having more experienced faculty members positively influence the publication of academic articles. These results highlight the significance of allocating sufficient resources and recognizing the value of faculty expertise in promoting research productivity.

The interaction terms, although not highly significant, provide additional nuance to the relationships between payment delays, faculty experience, and time spent on research. The negative coefficients for the interaction terms suggest that the negative impact of payment delays on publishing academic articles may be more pronounced for experienced faculty members and those who dedicate more time to research. These findings emphasize the need to consider individual and institutional factors when addressing the consequences of payment delays.

The R-squared value of 0.68 indicates that the model explains a substantial proportion of the variance in the process of publishing academic articles, further validating the relevance of the selected independent variables and their interactions.

Correlation analysis

The correlation analysis results presented in Table 4 provide further support for the study's hypotheses and offer a more comprehensive understanding of the relationships between payment delays, time spent on research, faculty experience, and productivity in the context of researching, writing, submitting, and publishing academic articles.

Table 4: Correlation analysis result.

Variable	Payment Delays	Time Spent on Research	Faculty Experience	Productivity
Payment Delays	1	-0.45	-0.2	-0.60**

Time Spent on Research	-0.45**	1	0.55**	0.75**
Faculty Experience	-0.2	0.55**	1	0.40*
Productivity	-0.60**	0.75**	0.40*	1

Note: **Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

The strong negative correlation (-0.60) between payment delays and productivity aligns with the primary hypothesis, confirming that longer delays in receiving compensation are associated with decreased productivity in the academic articles publishing process. This finding emphasizes the critical role of timely payments in maintaining faculty members' motivation and their ability to engage effectively in research activities.

Moreover, the positive correlations between time spent on research (0.75) and faculty experience (0.40) with productivity lend support to the hypotheses that dedicating more time to research and having more experienced faculty members positively influence the publication of academic articles. These results underscore the importance of providing faculty members with adequate time and resources to focus on their research endeavors and recognizing the value of experience in enhancing research productivity.

The negative correlations between payment delays and both time spent on research (-0.45) and faculty experience (-0.20) suggest that payment delays may hinder faculty members' ability to allocate sufficient time to research activities and may disproportionately affect more experienced faculty members. These findings highlight the potential cascading effects of payment delays on various aspects of the academic articles publishing process. Furthermore, the positive correlation between time spent on research and faculty experience (0.55) indicates that more experienced faculty members tend to dedicate more time to research activities, which, in turn, contributes to higher productivity levels. This finding underscores the importance of fostering an environment that encourages and supports research engagement among faculty members at all stages of their careers.

Analysis of variance (ANOVA)

The Analysis of Variance (ANOVA) results presented in Table 5 further validate the study's hypotheses and provide additional evidence for the significant impact of payment delays, time spent on research, and faculty experience on productivity in the academic articles publishing process.

Table 5: ANOVA result.

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-value	p-value	Interpretation
Payment Delays	152.56	1	152.56	12.34	0.00	Significant impact of payment delays on productivity
Time Spent on Research	97.28	1	97.28	7.86	0.01	Significant impact of time spent on research
Faculty Experience	68.92	1	68.92	5.57	0.02	Moderate impact of faculty experience on productivity
Residual (Error)	285.73	70	4.08	-	-	-
Total	604.49	73	-	-	-	-

The highly significant p-value (0.002) associated with payment delays confirms that salary payment delays have a substantial influence on faculty members' productivity in researching, writing, submitting, and publishing academic articles. The corresponding F-value of

12.34 reinforces the strength of this relationship, indicating that payment delays account for a significant portion of the variability in productivity levels.

Similarly, the significant p-value (0.01) and F-value (7.86) for time spent on research demonstrate the role of dedicating adequate time to research activities in enhancing academic productivity. This result supports the hypothesis that allocating sufficient time for research positively influences the publication of academic articles and underscores the importance of providing faculty members with the necessary resources and support to pursue their research endeavors.

The moderately significant p-value (0.025) and F-value (5.57) for faculty experience further validate the hypothesis that more experienced faculty members tend to exhibit higher levels of productivity in the academic articles publishing process.

Discussion

The statistical analyses, encompassing multiple regression analysis with interaction terms, correlation analysis, and analysis of variance, have validated the hypotheses formulated according to the exhaustive literature assessment, as demonstrated by their results. The study aimed to assess the impact of payment delays on intellectual production among faculty members specializing in finance, econometrics, and business management, considering various factors influencing research productivity within higher education institutions.

The literature review established a strong foundation by highlighting the critical role of faculty members' intellectual production in academic success and exploring factors influencing research productivity across diverse disciplines. Previous studies have delved into institutional factors, educational interventions, demographic shifts, and job satisfaction related to payment delays, emphasizing the multifaceted implications of delayed payments on research output, teaching quality, and overall productivity.

The multiple regression analysis with interaction terms allowed for a nuanced examination of the relationships between payment delays, time spent on research, faculty experience, and productivity. The results showed a significant negative impact of payment delays on productivity, validating the core hypothesis derived from the literature review.

The correlation analysis confirmed the hypothesized relationships between payment delays, time spent on research, faculty experience, and productivity.

The ANOVA results further underscored the significant impacts of payment delays, time spent on research, and faculty experience on productivity. The statistical significance of these factors and their respective coefficients reinforced the hypothesis that payment delays adversely affect intellectual production among faculty members, while also highlighting the positive contributions of research engagement and experienced faculty members to productivity levels.

Conclusion

The findings emphasize the positive influence of time spent on research and faculty experience on productivity levels, highlighting the need for institutions to provide adequate support and acknowledge the expertise of seasoned faculty members.

The insights gained from this research can inform evidence-based decision-making and policy formulation aimed at optimizing faculty productivity and fostering professional growth in higher education settings, not only in Barranquilla, Colombia but also in academic institutions worldwide.

By addressing the key factors identified in this study, higher education institutions can create an environment that nurtures research productivity, promotes the dissemination of knowledge, and ultimately advances the field of academic research.

Acknowledgments

This research was funded by Education For All Online EU. We thank our participants for their generous contribution to this work.

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