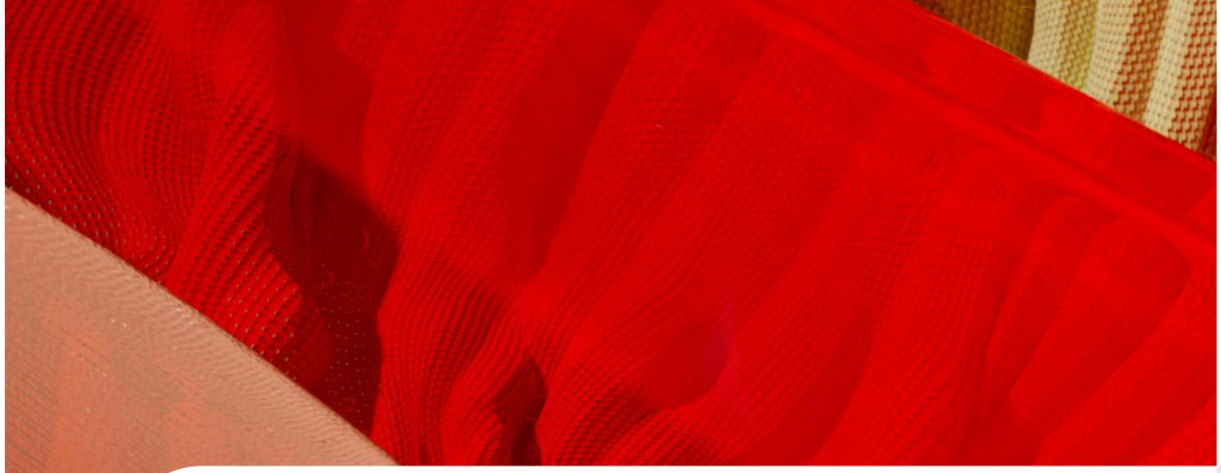

Institution-Asserted ORCID Affiliations as Indicators of Research Performance and Institutional Standing

SCImago

scimagolab.com

Contents

Executive Summary

This report investigates whether the strategic adoption of ORCID, specifically through institution-asserted affiliations (trust markers), is associated with stronger research performance, and higher global rankings. Institution-asserted affiliations represent verified researcher information provided directly by institutions, signalling commitment to authenticated identity management and interoperable digital infrastructure.

Analysing ORCID affiliation patterns across 9,720 institutions reveals a statistically significant relationship: institutions with higher adoption of trust markers demonstrate better research visibility and higher-ranking performance, although self-asserted affiliations still dominate overall. These findings highlight how intentional digital identity management supports institutional excellence and can be leveraged as part of broader digital infrastructure and research performance initiatives.

The analysis reveals:

- Institution-asserted affiliations constitute a small but meaningful share of SCImago-linked ORCID records (mean: 0.89%). This figure reflects only the subset of ORCID records linked to the SCImago corpus; across the full ORCID registry, the proportion of institution-asserted affiliations is somewhat higher.
- Institutions with higher proportions of trust-marked affiliations tend to hold better global rankings.
- Patterns vary by region and sector suggesting that digital infrastructure, research culture, and policy environments shape ORCID practices.
- These results indicate that ORCID records with institution-asserted affiliations may serve as a signal of research ecosystem maturity, aligning with higher performance across global ranking systems.

Introduction

The adoption of ORCID identifiers has become a cornerstone of digital researcher identity management. ORCID enables the unambiguous attribution of scholarly outputs to individual researchers, while also allowing institutions to verify and assert information within researcher profiles. Institution-asserted data, often referred to as trust markers, can apply not only to affiliation information but to all sections of an ORCID record. This verified profile data is supplied directly by institutions, reflecting both institutional commitment to robust research governance and investment in digital infrastructure.

The core purpose of this study was to determine whether institutions that assert ORCID trust markers exhibit higher global rankings and stronger research performance indicators. Trust markers represent provenance information for any ORCID record item asserted by an institution, including affiliations, professional activities, works, funding, peer review, identifiers, and research resources. By examining nearly 10,000 institutions, this study explored whether institutional digital maturity and identity management practices across the full ORCID record are associated with institutional success and global visibility.

Research Questions

The study addresses the following questions:

1. Does the presence of institution-asserted affiliations (trust markers) correlate with higher global rankings?
2. Does institutional support for ORCID (e.g., integrations, mandates) align with measurable research success indicators?
3. How does ORCID adoption (by type of assertation) vary across:
    a. Region (Europe, North America, Asia-Pacific)
    b. Sector (research-intensive vs teaching-focused institutions)

Conceptual Framework

This study operates on a framework connecting researcher identity management, institutional digital infrastructure, and performance outcomes:

Institution-asserted affiliations (Trust Markers): Verified profile information directly provided by institutions. Reflects organizational investment in identity governance and reliable metadata.

Digital Infrastructure Maturity: Institutions with systematic ORCID adoption are assumed to have more sophisticated workflows, integrations, and support systems.

Research Performance & Visibility: Higher research output, quality, and citation impact are hypothesized to correlate with more structured digital identity practices.

Global Ranking Indicators: International rankings capture reputational, research, and performance metrics, potentially influenced by digital and research infrastructure maturity.

The framework theorizes that strategic adoption of trust markers signals not only a commitment to transparent identity management but also correlates with improved research visibility and institutional success.

Methodology

Data Collection

ORCID Data Acquisition:

The study utilized the ORCID 2024 public data file, which included 8,894,189 researcher profiles with at least one affiliation record. This dataset provided a comprehensive view of global ORCID adoption across a wide range of institutions, regions, and sectors. By leveraging this dataset, we ensured that our analysis captured both large research-intensive institutions as well as smaller organizations.

Each ORCID profile was categorized based on the type of affiliation recorded. Institution-asserted affiliations, also referred to as trust markers, are verified by the institution and reflect its efforts to maintain accurate researcher identity information. Self-asserted profiles, in contrast, are entered by individual researchers and are not verified by the institution. This distinction allowed the study to evaluate the impact of verified affiliation practices on institutional performance.

Institutional Metadata:

To contextualize ORCID adoption, each institution was annotated with metadata including geographic region, sector classification, institution size (measured by Scientific Talent Pool), and research output metrics. These variables enabled detailed comparative analyses across different types of institutions.

Institutional identifiers were cross-referenced with Scopus and SCImago institutional ranking (SIR) which include performance indicators such as publication volume, citation impact, and overall ranking. This step ensured that the study could directly link ORCID adoption patterns with measurable institutional outcomes, forming the basis for correlation and comparative analyses across ranking quartiles, sectors, and geographic regions.

Table 1 demonstrates the difference in profile counts. These counts might appear smaller because individual profiles may contain multiple affiliation assertions. A profile is considered “linked” if at least one assertion is connected to a SIR institution. For the purposes of this table only, the main analysis focuses on individual affiliation assertions.

	Linked with SCImago Institutions Rankings	Total	% Linked
Profiles with at least one affiliation	8,199,407	8,894,189	92.19%
Total affiliations	9,246,830	12,899,568	71.68%
Self-asserted affiliations	8,938,861	12,583,409	71.04%
Institutional assertions	307,969	316,085	97.43%
Third party affiliations	0	74	0%

Table 1: distribution of assertions per assertion type and percentages linked to SIR institutions

Analysis

Profile Classification:

For each institution, the proportion of institution-asserted versus self-asserted affiliations was computed. This metric provided a quantitative measure of trust marker adoption and allowed for comparisons across institutions with varying sizes, research capacities, and regions. This classification facilitated the identification of leading institutions with advanced digital identity practices, as well as those lagging in adoption.

Correlation Analysis:

Spearman rank correlation analyses were employed to evaluate the relationship between institution-asserted affiliation adoption and institutional performance indicators, including overall rankings, but also research, innovation, and societal factors. Non-parametric statistical tests (Kruskal-Wallis) were used to assess differences across ranking quartiles, quantifying the extent to which verified ORCID adoption associates with stronger institutional outcomes.

Correlation strengths were compared across regions and sectors. This comparative analysis provided insights into whether specific types of institutions could benefit more from institution-asserted affiliations and whether adoption patterns are regionally or structurally influenced.

Pattern Analysis:

Mapping geographic and systemic adoption: the analysis of regions highlighted areas with concentrated adoption, as well as regions where institution-asserted affiliations remain sparse, revealing potential opportunities for institutional capacity-building.

Identifying clusters of advanced institutions: Institutions exhibiting high adoption of trust markers were identified. These are institutions with high percentage of affiliations that are asserted by the institution rather than individuals. Identifying these clusters helped establish benchmarks and best practices for other institutions aiming to strengthen their researcher identity management.

Methodological Considerations

Self-asserted affiliations vastly outnumber institution-asserted affiliations, requiring proportion-based metrics for meaningful comparison.

Institutional rankings are multi-dimensional constructs that synthesize diverse performance indicators including research output, citation impact, innovation metrics, and societal engagement. This study examined correlations with four distinct ranking dimensions to capture the complexity of institutional performance.

This study has several limitations. First, institution-asserted affiliations may be underreported, as not all institutions that support ORCID actively assert affiliation data or other trust markers in researcher records, and such practices vary widely in maturity and consistency. Second, regional differences in ORCID adoption, policy mandates, and technical capacity may influence both the presence of institution-asserted data and institutional representation in the dataset, potentially introducing geographic bias into the observed relationships.

Findings

Correlation Between Global Ranking and ORCID Affiliation Type

To explore whether higher-ranked institutions exhibit greater adoption of ORCID institution-asserted affiliations (trust markers), we examined the relationship between the proportion of institution-sourced versus self-asserted affiliations in ORCID profiles and global ranking position.

We first calculated Pearson correlation coefficients as a baseline measure. Pearson is commonly used to assess linear relationships between two continuous variables and serves as a useful default metric. However, global rankings are ordinal by nature, meaning they represent relative positions rather than interval-scaled measurements. In such cases, Spearman's rank correlation is more appropriate because it evaluates the monotonic relationship between variables based on their ranked order, rather than assuming linearity or equal intervals.

Using Spearman correlation allows us to more accurately capture the association between institutional ranking and the adoption of institution-sourced ORCID records, providing insights into whether stronger research-performing institutions are more likely to implement verified affiliation workflows.

Using Spearman rank correlation to assess the relationship between institutional ranking and the proportion of ORCID institution-asserted affiliations, we observed a statistically significant negative correlation ($\rho = -0.227$, $p < 0.001$). The negative coefficient indicates that better-ranked institutions, that is, those with lower numerical positions, tend to have a higher proportion of trust-marked ORCID affiliations.

The Pearson correlation ($r = -0.113$, $p < 0.001$) (see figure 1) measures the linear relationship between two continuous variables. In this case, numerical global ranking and the proportion of institution-sourced ORCID affiliations. The Pearson correlation assumes that the data are approximately normally distributed and that the relationship is linear. The weak negative value suggests a slight tendency for higher-ranked institutions to have more institution-asserted affiliations, but it does not account for the ordinal nature of ranking data.

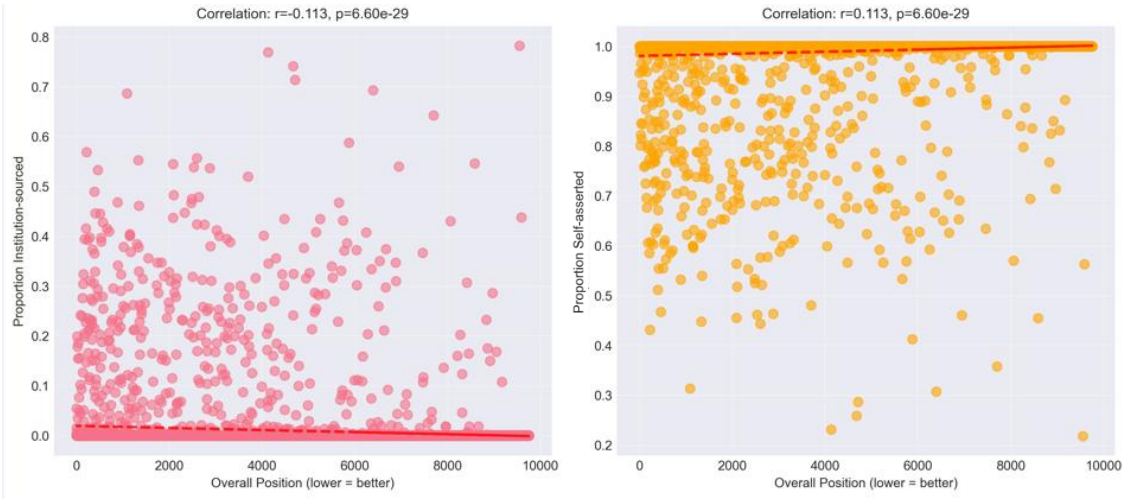

Figure 1: Pearson correlation (ranking vs. institution-sourced): r = -0.113, p < 0.001

The Spearman correlation (ρ = -0.227, p < 0.001), (see figure 2), on the other hand, is a rank-based, non-parametric measure. It assesses the monotonic relationship between two variables, making it more appropriate when dealing with ranked data, such as institutional rankings, and non-normally distributed variables, such as the highly skewed proportion of institution-sourced affiliations. The stronger negative correlation indicates that as institutions improve their rank (lower numeric value), there is a clearer tendency to have a higher proportion of validated affiliations. Spearman's method is less sensitive to outliers and does not assume linearity, which makes it more meaningful for interpreting patterns in ranking-based data.

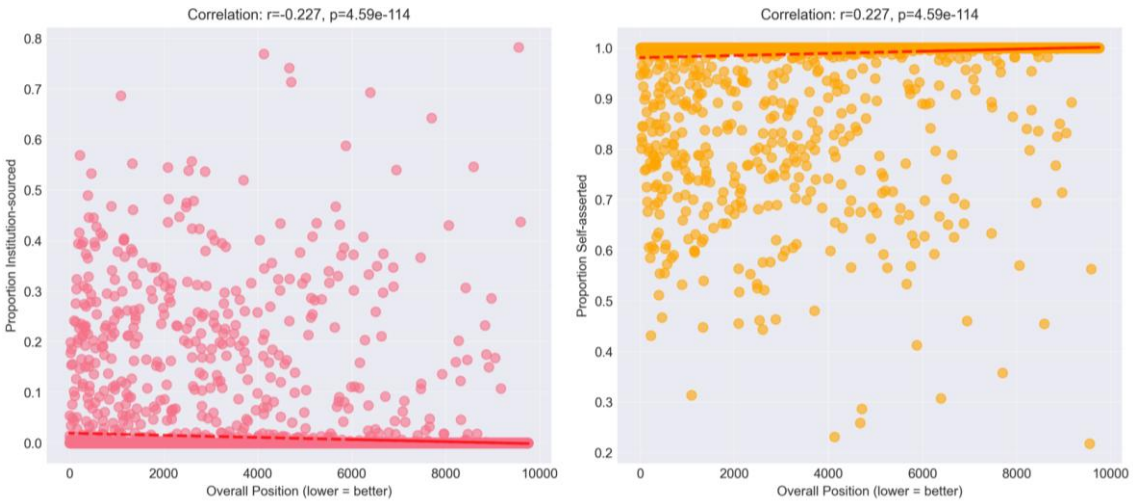

Figure 2: Spearman correlation (ranking vs. institution-sourced): ρ = -0.227, p < 0.001

The finding highlights that ORCID profiles with institutionally asserted affiliations, can serve as one indicator of organizational emphasis on digital research infrastructure and strategic researcher identity management and plausibly as a peripheral indicator of certain positive organizational practices.

While this result is statistically significant, the correlation is weak to moderate in strength. This suggests that, although there is a relationship between global ranking and verified ORCID adoption, it would be much lighter than other factors beyond researcher identity management practices, such as institutional size, publication output, citation impact, or international collaborations.

Do higher-ranked institutions have a stronger presence of trusted, institution-sourced data in ORCID?

Table 2 presents the distribution of ORCID affiliations by ranking quartiles, comparing institution-sourced (trust-marked) versus self-asserted affiliations.

A Kruskal–Wallis test confirmed significant differences between ranking quartiles ($H = 460.86$, $p < 0.001$), indicating that these differences are highly unlikely to occur by chance. The analysis reveals that top-ranked institutions exhibit stronger presence of institution-verified data in ORCID. Specifically, universities in the highest-ranked quartile have approximately seven times more institution-sourced affiliations (1.71%) compared to those in the lowest-ranked quartile (0.24%).

These results suggest that researchers affiliated with leading institutions are more likely to maintain ORCID profiles with verified, institution-asserted data. Conversely, lower-ranked institutions show fewer such verified records, indicating less consistent adoption of formalized identity management practices. This pattern highlights a clear association between institutional prestige and the strategic use of trust markers in researcher identity workflows.

Quartile	Institutionally asserted (%)	Self-asserted (%)	N
Top 25%	1.71%	98.29%	2,434
25-50%	1.06%	98.94%	2,430
50-75%	0.56%	99.44%	2,428
Bottom 25%	0.24%	99.76%	2,428

Table 2: Distribution by quartile of institutionally vs self-asserted employments

This pattern is further illustrated in Figure 3, which visualizes the distribution of institution-sourced versus self-asserted employment across ranking quartiles.

The two panels in the figure show how ORCID affiliation types are distributed across institutions grouped by ranking quartiles:

Left Panel – Institution-Sourced Validated Affiliations: The proportion of institution-validated affiliations is highest in the top 25% of institutions and decreases progressively across lower ranking quartiles.

Top-ranked institutions exhibit the widest spread of higher proportions, indicating that many of their researchers have at least some verified affiliations. Conversely, the bottom 25% shows very low proportions, with most institution-sourced affiliations near zero.

This visual reinforces the earlier finding that top-ranked institutions have roughly seven times more institutional verified affiliations than the lowest-ranked group.

Right Panel – Self-Asserted Affiliations: Self-asserted affiliations dominate across all quartiles, with proportions generally clustered near 1.0 (or 100%), indicating that most researchers manually enter their data without institutional verification. While self-asserted affiliations are common in every quartile, the highest-ranked institutions still show slightly lower medians, reflecting their relatively higher use of institution-sourced entries.

The figure provides a clear visual representation of the disparity between top-ranked and lower-ranked institutions in terms of validated ORCID affiliations. It highlights that higher-ranked institutions invest more in ensuring researchers have officially validated profiles, while self-asserted affiliations remain prevalent across the board, especially in lower-ranked institutions.

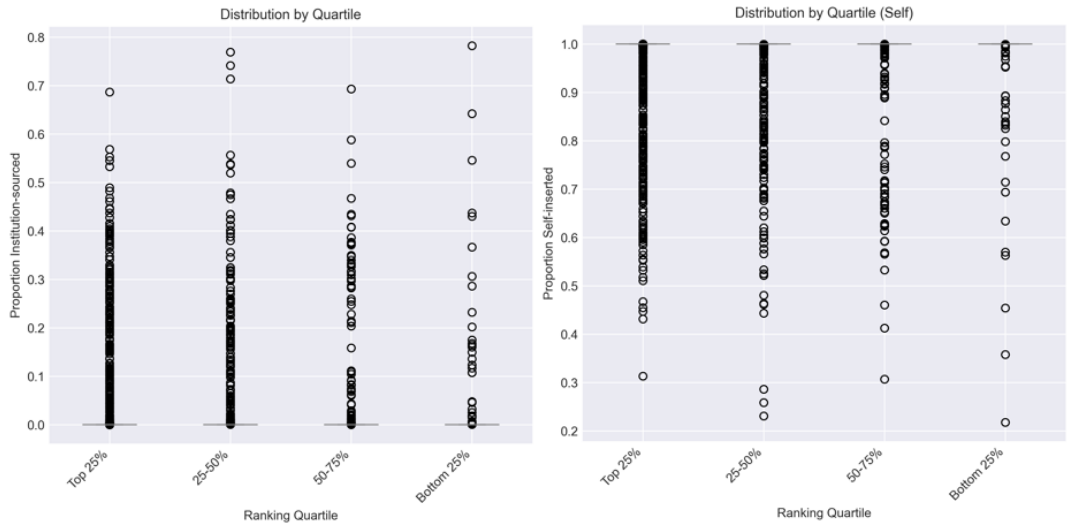

Figure 3: Distribution by quartile of institutionally vs self-asserted employment

Research, Innovation and Societal Rankings

This section examines how institutional performance across several global ranking metrics relates to the way ORCID profiles are populated. Figure 4 presents four panels that show the proportion of ORCID profiles that have institutional validated affiliation, which refers to information entered or maintained by the institution rather than by individual researchers. The y-axis in every panel represents the proportion of institution-sourced content, while the x-axis varies across the four ranking dimensions: overall performance, research performance, innovation performance, and societal impact. Each panel also reports Spearman's correlation coefficient and the corresponding p-value, both of which indicate the strength and statistical significance of the observed relationships.

Overall Ranking

In the top-left panel, overall ranking exhibits a modest but highly significant negative correlation with the proportion of profiles with institutionally asserted affiliations ($\rho = -0.2272$, $p \approx 4.59e\text{-}114$). Institutions that achieve higher overall performance, which means they hold lower numerical rank values, tend to have a greater share of ORCID records populated or verified at the institutional level. This suggests that stronger universities are more likely to integrate ORCID into central administrative workflows, such as research information management systems, faculty reporting processes, or automated data verification tools.

The pattern in self-asserted ORCID content follows a mirror trend. When institutions perform more poorly in overall rankings, researchers rely more heavily on manually entering their own data into ORCID. This implies that institutions with fewer resources or weaker administrative infrastructure may depend more on individual researchers to maintain the accuracy and completeness of their ORCID records. The mirrored pattern helps to clarify the broader structure: stronger institutions tend to centralize ORCID management, while weaker institutions tend to decentralize it.

Research Impact Ranking

The top-right panel reveals a negative correlation of similar magnitude for research impact ranking ($\rho = -0.2219$, $p \approx 9.96e\text{-}109$). Institutions with strong research performance are more likely to maintain ORCID profiles with institutionally asserted affiliation. This likely reflects the greater emphasis that high-performing research institutions place on consistent identity management, accurate publication tracking, and the integration of ORCID IDs into grant management systems, repository workflows, and ongoing research evaluation processes.

The mirrored trend in self-asserted profiles reinforces this interpretation. Institutions that perform poorly in research impact rankings tend to demonstrate higher proportions of self-entered profile information. This implies that researchers in lower-ranked institutions must take more responsibility for curating their own ORCID data because institutional systems or policies do not provide the same level of automated support. The opposite movement in self-asserted profiles further illustrates that strong research institutions treat ORCID as part of

core digital research infrastructure, while weaker institutions may treat it more as an optional or individually managed identity tool.

Innovation Ranking

The bottom-left panel shows the weakest negative correlation across the four ranking categories ($\rho = -0.0995$, $p \approx 7.77e\text{-}23$). Although the relationship is statistically significant due to the large dataset, the effect size is relatively small. This indicates that innovation ranking is not strongly associated with whether ORCID profiles have institutionally-asserted or self-asserted affiliations. Institutions that perform well in innovation do not appear to differ substantially from lower-performing institutions in terms of ORCID data management practices.

The mirrored relationship in self-curated content is also weak, which suggests that innovation-oriented activity, such as industry collaboration, patent generation, or commercialization output, is not closely tied to ORCID profile curation. ORCID may play a less central role in innovation workflows compared to publication tracking or societal engagement processes. As a result, both institution involvement and self-involvement remain relatively low or inconsistent in institutions ranked by innovation performance.

Societal Impact Ranking

The bottom-right panel presents the strongest negative correlation among the four metrics ($\rho = -0.2704$, $p \approx 1.75e\text{-}162$). Institutions that perform well in societal impact tend to have a notably larger proportion of profiles with institutionally asserted affiliations. This is likely because institutions with strong societal missions place greater emphasis on documenting contributions to community engagement, outreach activities, public policy work, clinical services, and other forms of non-academic impact. To capture these activities accurately, such institutions often rely on centralized systems for researcher record management, including verified ORCID data.

Profiles with self asserted affiliations, show the mirror trend. Institutions with weaker societal impact have much higher proportions of self-curated ORCID entries. This mirrored relationship indicates that institutions with limited societal impact might rely more heavily on individuals to record their own activities. Institutions with strong societal impact, by contrast, appear to adopt coordinated approaches for ensuring that researcher identity information is complete, validated, and consistent across records.

Together, the results reveal a clear and coherent structural relationship between institutional ranking performance and the distribution of ORCID data sources. Better-ranked institutions tend to have higher levels of institution-asserted information across nearly all ranking categories. At the same time, self-asserted information follows a consistent mirror trend in which lower-ranked institutions show greater individual responsibility for maintaining ORCID records.

These mirrored relationships are strongest for overall and societal rankings, moderate for research rankings, and weakest for innovation rankings. This pattern suggests that institutions

excelling in societal and overall performance are more likely to embed ORCID into formal administrative systems, while those performing strongly in innovation do not appear to differ substantially from lower-performing institutions in terms of ORCID-related practices. The dual patterns of institution-asserted and self-asserted affiliations reveal how institutional capacity, strategic priorities, and investment in research infrastructure shape the extent to which ORCID profiles are centrally managed or individually curated.

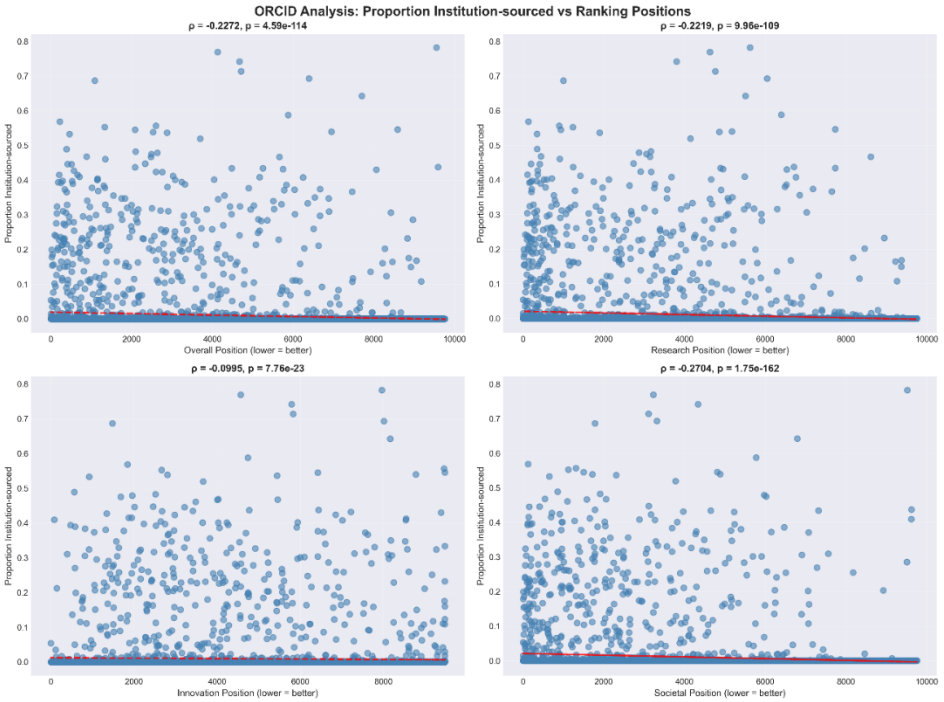

Figure 4: Research, Innovation and Societal Rankings of institutional asserted profiles

Regional Outlook

The geographical distribution of institutionally asserted affiliations (table 3) reveals substantial regional disparities in ORCID adoption. Western Europe dominates the global landscape, accounting for nearly two thirds of all institutional assertions. This leadership is consistent with long-standing investments in research information management systems, strong policy support for persistent identifiers, and high levels of digital infrastructure maturity. The region also exhibits one of the highest ratios of institutional asserted affiliations relative to total affiliations (7.9%), indicating a comparatively embedded use of ORCID within institutional workflows.

The Pacific Region also stands out, with an exceptionally high assertion ratio of 11.9%. Although the region's overall employment base is smaller, the high proportional adoption suggests a strong commitment to researcher identity management among institutions in this area.

Northern America shows moderately high adoption both in absolute numbers and as a proportion of total employments (2.0%), reflecting a mature research ecosystem but perhaps more heterogeneous institutional practices compared with Western Europe.

Other regions present considerably lower adoption levels. Eastern Europe, with a 2.4% ratio, displays moderate engagement, possibly reflecting emerging but uneven institutional capacities.

Africa, the Middle East, and Latin America cluster around ratios between 0.7% and 1.5%, suggesting limited integration of ORCID in institutional processes despite sizable research communities in some countries.

The Asiatic Region, despite having the second-largest employment base, shows a relatively low adoption ratio (0.8%), indicating that large research systems do not necessarily translate into widespread ORCID integration.

Overall, the pattern reveals that institutional ORCID assertions are probably shaped by regional differences in digital infrastructure, policy incentives, and the maturity of research information management practices. High-adoption regions appear to combine technological capacity with institutional commitment, while others show more incremental or fragmented uptake.

World Region	Institutionally asserted affiliations	Affiliations	Ratio of institutional asserted affiliations	% of total institutional asserted affiliations
Western Europe	197,666	2,494,544	7.9%	64.2%
Northern America	32,051	1,637,622	2.0%	10.4%
Pacific Region	27,109	226,888	11.9%	8.8%
Asiatic Region	17,170	2,078,137	0.8%	5.6%
Eastern Europe	12,409	522,227	2.4%	4.0%
Middle East	9,028	614,298	1.5%	2.9%
Latin America	8,749	1,217,878	0.7%	2.8%
Africa	3,779	258,570	1.5%	1.2%
World	8	196,666	0.0%	0.0%
Grand Total	307,969	9,246,830	3.3%	100.0%

Table 3: Distribution of institutionally asserted ORCID employments across world regions, including regional assertion ratios and each region's share of all institutional ORCID assertions.

Table 4 summarizes regional correlations between the proportion of institutionally asserted ORCID profiles and overall ranking position. Negative Spearman correlation values indicate that regions where institutions more actively assert affiliations in ORCID profiles tend to achieve better overall ranking performance (i.e., lower numerical ranks). In contrast, weaker

or nonsignificant correlations suggest little systematic association between ORCID integration practices and ranking outcomes.

Across all major regions, the correlation is negative, indicating a globally consistent pattern: stronger institutional involvement in ORCID record management is modestly associated with better performance in international rankings. However, the strength of this association varies substantially across regions.

Northern America shows the strongest correlation ($\rho = -0.305$, $p \approx 5.89e\text{-}30$), suggesting that institutions in this region with higher shares of institution-asserted affiliations tend to occupy significantly better ranking positions. This may reflect robust research information management systems and stronger integration of ORCID into institutional workflows.

Africa ($\rho = -0.261$, $p \approx 1.55e\text{-}06$) and the Asiatic Region ($\rho = -0.180$, $p \approx 1.83e\text{-}23$) also show relatively strong negative correlations. In these regions, institutional management of ORCID profiles appears meaningfully connected to better ranking performance. This could indicate emerging but effective research infrastructure efforts.

Western Europe ($\rho = -0.158$) and the Middle East ($\rho = -0.180$) display moderate correlations, each statistically significant. These values suggest that institutional ORCID assertion is beneficial but not as strongly linked to ranking outcomes as in Northern America.

Region	N	Average Scientific Talent Poll	Average Profiles	Average Employments	Spearman corr %Institution assert.	P_values
Asiatic Region	3,035	3,179	643	685	-0.180	1.83E-23
Western Europe	2,410	2,184	845	1,035	-0.158	7.07E-15
Northern America	1,328	3,230	1,099	1,233	-0.305	5.89E-30
Eastern Europe	864	1,228	545	604	-0.124	0.00027001
Middle East	746	1,450	760	823	-0.180	6.97E-07
Latin America	641	1,897	1,748	1,900	-0.089	0.02497886
Africa	329	1,274	705	786	-0.261	1.55E-06
World	202	2,315	890	974	-0.077	0.27685524
Pacific Region	165	2,461	1,095	1,375	-0.124	0.11310604
Worst					1.000	

Table 4: Correlations between proportion of institutionally asserted profiles and Overall position in the ranking, by region. Negative values imply better positions are linked to higher proportions.
*Not significant (p-values over 0.05)

In contrast, Latin America ($\rho = -0.089$) and Eastern Europe ($\rho = -0.124$) show comparatively weak associations. Although statistically significant, the effect size is modest, indicating that institutional ORCID practices may play a more limited role in shaping competitive performance in these regions.

The one region with no statistically significant relationship is the Pacific Region ($\rho = -0.124$, $p \approx 0.11$). For this region, the proportion of institutionally asserted profiles does not meaningfully track with overall ranking performance. This may be due to small sample sizes, regional heterogeneity, or uneven ORCID adoption patterns.

Overall, the regional outlook highlights a consistent global tendency: institutions that more systematically manage ORCID records tend to perform better in ranking systems, with the strongest effects observed in Northern America and Africa. These findings suggest that institutional engagement with persistent identifiers like ORCID may be part of broader organizational practices that support research impact, visibility, and performance.

Sectoral Patterns in Institutional ORCID Assertion and Ranking Performance

The distribution of institutionally asserted affiliations (table 5) shows a strong concentration in the higher education sector, which accounts for more than 90% of all institutional ORCID assertions. This dominance reflects both the size of the academic workforce and the comparatively advanced adoption of identity-management practices within universities. The ratio of institution asserted affiliations to total affiliations in this sector (3.9%) is also the highest, suggesting that higher education institutions are more likely to integrate ORCID into their administrative and research-information workflows.

In contrast, the remaining sectors government, health, private, and others exhibit lower levels of institutional assertions, both in absolute numbers and relative proportions. While the government and health sectors employ large numbers of researchers and professionals, their ratios of institutional assertions (1.5% and 0.9%, respectively) remain modest. This pattern may reflect different institutional priorities regarding ORCID integration and alternative approaches to managing researcher identity across these sectors, where digital identity practices may be less standardized or less central to organizational missions.

The private sector and the residual “others” category show the lowest adoption levels in both absolute and relative terms. These sectors typically encompass heterogeneous organizations whose engagement with scholarly communication infrastructures varies widely, which may contribute to the limited uptake.

Overall, the results indicate that institutional ORCID assertions are probably shaped by sectoral differences in organizational structures, administrative capacity, and the relevance of persistent researcher identifiers to core activities.

Sector	Institutionally asserted employments	Employments	Ratio of institutional assertions	% of total institutional assertions
Higher educ.	284,225	7,205,789	3.9%	92.3%
Government	13,255	856,253	1.5%	4.3%
Health	7,955	848,351	0.9%	2.6%
Private	2,022	241,760	0.8%	0.7%
Others	512	94,677	0.5%	0.2%
Grand total	307,969	9,246,830	3.3%	100.0%

Table 5: Distribution of institutionally asserted ORCID employments by sector, showing the proportion of assertions relative to total employments and each sector's contribution to the overall volume of institutional ORCID assertions.

Table 6 presents the Spearman correlations between the proportion of profiles with institutionally asserted affiliations and overall ranking position, broken down by sector. As in previous analyses, negative correlation values indicate that sectors with higher rates of institution-managed ORCID records tend to achieve better ranking performance (i.e., lower numerical ranks). Positive or near-zero correlations imply little to no relationship.
A clear pattern emerges: the strength of this association varies sharply across sectors, with higher education standing out as the dominant contributor.

Higher Education

The higher education sector exhibits the strongest relationship by a substantial margin ($\rho = -0.339$, $p \approx 1.25e\text{-}135$). Institutions in this sector that maintain larger shares of profiles with institutionally asserted affiliations consistently achieve better ranking outcomes. This finding aligns with expectations, as universities often integrate ORCID into research information systems, publication management workflows, and hiring or promotion processes. The large sample size reinforces the robustness of this relationship.

Government Sector

The government sector shows a moderate negative correlation ($\rho = -0.137$, $p \approx 2.83e\text{-}10$). Although weaker than in higher education, the relationship is statistically significant, indicating that government institutions with stronger ORCID integration tend to perform slightly better in rankings. This may reflect increasing adoption of standardized researcher identifiers for policy research, national laboratories, and public research agencies.

Sector	N	Average Scientific Talent Pool	Average Profiles	Average affiliations	Spearman Corr %Institution assert.	P-Values
Higher educ.	5,040	3,139	1,266	1,430	-0.339	1.25E-135
Government	2,106	1,659	357	407	-0.137	2.83E-10
Health	1,963	1,888	389	432	-0.159	1.36E-12
Private	396	1,593	561	611	0.002	0.971457081
Others	215	939	381	440	-0.017	0.807315025

Table 6: Correlations between proportion of institutionally asserted affiliations and Overall position in the ranking, by sector. Negative values imply better positions are linked to higher proportions.
*Not significant (p-values over 0.05)

Health Sector

The health sector also displays a moderate negative correlation ($\rho = -0.159$, $p \approx 1.36e\text{-}12$). This suggests that research hospitals, medical research institutes, and related organizations benefit from institutional ORCID assertion in ways that relate to improved ranking performance. The correlation, though not strong, is consistent with the growing emphasis on research visibility and compliance in clinical and biomedical environments.

Private Sector

In contrast, the private sector shows no meaningful relationship ($\rho \approx 0.002$, $p \approx 0.97$). This indicates that institutional management of ORCID profiles is largely irrelevant to ranking outcomes within private organizations. Private sector entities may engage with research differently, often focusing on proprietary development or industry-specific outputs not captured as directly by academic ranking systems.

Overall, the sectoral analysis shows that institutional ORCID assertion is most strongly associated with better ranking outcomes in the higher-education sector, with smaller but still significant effects in the government and health sectors. In contrast, private-sector and miscellaneous organizations exhibit no meaningful correlation

Conclusions

The analysis demonstrates a statistically significant, though substantively modest, correlation between an institution's ranking position and the proportion of ORCID records with affiliations inserted by the institution rather than individual researchers. While the relationship is robust across multiple metrics and regions, it accounts for only a limited share of the variance in ranking outcomes. This suggests that although ORCID data governance is associated with performance, it operates alongside many other influential factors such as research funding, institutional size, disciplinary strengths, and international collaborations.

Higher-ranked institutions are leaders in trusted, institution-asserted ORCID data and are probably more likely to implement system-level ORCID integrations. These organizations could potentially have stronger research information infrastructures and more mature administrative processes supporting persistent identifiers. Their higher adoption of institution-asserted affiliations may also suggest strategic commitments to open research, compliance with funder requirements, or the need for accurate internal and external reporting and analytics. In this sense, ORCID governance may hint a broader organizational sophistication.

Institutional adoption of ORCID remains limited across the entire ecosystem
Despite the leadership of top-tier institutions, self-asserted ORCID profiles continue to dominate globally, representing 98.29% of all observed records. Even among elite institutions, the uptake of institutionally managed ORCID data is far from universal. This indicates that while integration is gaining traction, there is significant potential for institutions worldwide to strengthen automation, verification, and data quality through systematic ORCID adoption.

Clear geographic and sectoral disparities in ORCID governance emerged. Patterns of adoption vary widely by region and sector. Western Europe and the Pacific Region show the highest levels of institutional assertion, consistent with strong national research information systems in many countries within these areas. In contrast, developing regions exhibit minimal integration, likely reflecting gaps in infrastructure, policy support, and administrative capacity. Sectoral differences are similarly pronounced: higher education institutions lead by a considerable margin, whereas government, health, and especially private-sector organizations show much lower levels of adoption. These disparities suggest that both resource availability and institutional purpose shape ORCID integration practices.

Implications

The findings reinforce the hypothesis that institutional investment in trusted, system-integrated ORCID data is associated with stronger ranking performance. Institutions that actively assert ORCID trust markers appear more likely to exhibit characteristics commonly linked to research excellence and global visibility, including more mature research management practices, greater readiness of digital infrastructure, established information governance standards, and sustained engagement with open science workflows. Within the context of this study, institution-asserted ORCID data functions as an observable indicator of these underlying organizational capacities rather than as a direct driver of performance outcomes.

At the same time, the cross-sectional design of the analysis precludes causal inference. Higher-performing institutions may achieve better outcomes in part because they have invested in robust, interoperable research information systems, but it is equally plausible that institutions with greater resources, policy incentives, and international exposure are better positioned to implement and maintain such systems.

From this perspective, expanding ORCID integration, particularly in underrepresented regions and institutional sectors, may contribute to improved metadata completeness, enhanced research visibility, and more efficient administrative and reporting processes. While this study does not establish a causal pathway, it suggests that broader institutional adoption of trusted ORCID data practices could help narrow disparities in research representation and infrastructure capacity observed across the global higher education landscape.

Study Limitations

This study is subject to several limitations. First, the analytical approach relied on correlational methods, including Pearson and Spearman correlation coefficients to assess continuous relationships between levels of institution-asserted affiliations and global ranking metrics, and Kruskal–Wallis tests to compare distributions across ranking quartiles. Institutions were segmented into four quartiles based on overall ranking position to examine stratified patterns in ORCID integration and data governance practices. While these methods identify associations, they do not establish causality, and observed relationships may be influenced by unmeasured institutional characteristics such as size, funding intensity, or disciplinary composition.

Self-asserted ORCID affiliations substantially outnumber institution-asserted affiliations, making proportion-based metrics necessary to enable meaningful comparisons across institutions of different sizes and levels of ORCID adoption. Institution-asserted affiliations and other trust markers may also be underreported due to variability in implementation practices, system integration maturity, and the scope of data being asserted. Regional differences in ORCID adoption policies, technical capacity, and policy mandates may further influence both the prevalence of institution-asserted data and institutional representation in the dataset, potentially introducing geographic or structural bias.

Institutional rankings are inherently multi-dimensional constructs, synthesizing diverse performance indicators such as research output, citation impact, innovation activity, and societal engagement. While this study examined correlations across four distinct ranking dimensions to account for this complexity, ranking metrics themselves are composite indicators with known methodological constraints, which may affect interpretation of the results.

Taken together, these limitations suggest that the findings should be interpreted as indicative of associations between ORCID data governance and institutional performance rather than evidence of causal effects.

Recommendations

1. **Promote Institutional Integration Beyond Top-Tier Institutions**
   While higher-ranked institutions are leading in institution-asserted affiliations, the vast majority of records remain self-asserted (98.29%). ORCID should develop targeted strategies to encourage broader institutional adoption globally, emphasizing the benefits of automated, verified data for research reporting, analytics, and compliance with funder and policy requirements.

2. **Support System-Level ORCID Integrations**
   Institutions that implement system-wide ORCID integrations are more likely to assert trusted affiliations and other profile data. ORCID could provide enhanced guidance, technical resources, and standardized integration frameworks to help institutions of all sizes and regions adopt system-level solutions, improving data quality and completeness.

3. **Target Geographic and Sectoral Gaps**
   Adoption varies widely across regions and sectors. Priority regions for outreach and capacity-building include developing areas such as Latin America, Africa, South and Southeast Asia, and parts of Eastern Europe. Sectors with lower adoption include government agencies, health organizations, and the private sector, where institutional assertion of ORCID data remains minimal. ORCID should provide tailored support, training, and partnerships to increase integration in these regions and sectors.

4. **Highlight Organizational Benefits of Trust Markers**
   Institution-asserted affiliations correlate with organizational sophistication, including mature research information infrastructures and administrative practices. ORCID can emphasize how trust markers support strategic objectives like open science compliance, accurate reporting, and institutional visibility, helping motivate adoption across diverse institutions.

5. **Facilitate Best-Practice Sharing and Community Learning**
   Encourage knowledge exchange between high-performing institutions and those with

lower adoption. Sharing case studies, success stories, and practical guidance can help institutions understand the operational and strategic value of asserting ORCID data.

6. **Monitor and Report Progress on Adoption Metrics**
   Establish clear benchmarks and periodic reporting of institutional adoption by region, sector, and institution type. This would help ORCID track progress, identify gaps, and tailor support programs to areas with the greatest potential impact.

Definitions

Institutional-asserted affiliations
Affiliation information in an ORCID record that has been added or verified directly by the researcher's institution. Also called a trust marker, it reflects the institution's endorsement of the researcher's association and is considered a verified data point in ORCID. Institutional-asserted affiliations can be part of broader institution-asserted data, including professional activities, works, funding, peer review, identifiers, and research resources.

Self-asserted affiliations
Affiliation information in an ORCID record entered and maintained by the researcher themselves, without institutional verification. While these entries represent the researcher's claimed associations, they are not independently validated by the institution.

Institutional ranking by SCImago
A ranking of research institutions based on a combination of bibliometric indicators derived from the SCImago Institutions Rankings (SIR) methodology. These rankings evaluate institutions across multiple dimensions, including research output, citation impact, innovation activity, and societal engagement, providing a comparative measure of global research performance and visibility.

About SCImago

SCImago is a globally recognized research evaluation platform that provides insights into the impact and visibility of academic institutions, journals, and countries in the field of scientific research. It is best known for the SCImago Journal Rank (SJR), an alternative to the Journal Impact Factor, which assesses the influence of scientific journals by considering not only the number of citations received but also the prestige of the sources citing them. This ranking system is based on data from Scopus, one of the largest abstract and citation databases of peer-reviewed literature.

In addition to journal rankings, SCImago Institutions Rankings (SIR) evaluates research performance, innovation, and societal impact of universities and research institutions worldwide. It combines indicators such as the number of scholarly publications, international collaboration, and citations received, offering a comprehensive view of an institution's research strength. The SCImago Country Rankings further extend this evaluation to a national scale, highlighting how different countries contribute to global scientific output.

SCImago's rankings and reports are widely used by researchers, policymakers, and academic administrators to assess and improve research strategies. By offering data-driven insights, SCImago helps institutions identify strengths, benchmark against peers, and make informed decisions about research funding, collaborations, and journal selection. It plays a crucial role in the broader landscape of bibliometric analysis, influencing academic publishing and institutional research policies worldwide.