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Algorithmic Control and Perceived Fairness among Platform Workers: Evidence from Pakistan's Gig Economy

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Abstract

The current study focuses on the digital labour platforms which have been spreading rapidly, and this has fundamentally reorganized the work patterns in the developing economies, although the psychological and behavioural consequences of work controlled by an algorithm are not well known beyond the Western contexts. In this paper, the authors explore how algorithmic control is connected to the perceptions of fairness among the platform workers in Pakistan, the emerging economy possessing one of the fastest-growing freelance labour markets in the world. Basing on primary survey data provided by 350 active platform workers in twin cities (Rawalpindi and Islamabad) and analyzed using Structural Equation Modeling (SEM) in SmartPLS 4.0, the results show that the sub dimensions of algorithmic control have a statistically significant and negative impact on the perceptions of fairness among workers, and monitoring intensity, automated decision making, and opaque performance evaluation have turned out to be the most The research adds to the emerging body of literature on platform labour in the Global South, and provides practical suggestions to platform companies and policy makers in Pakistan.

Keywords: Algorithmic Control, Perceived Fairness, Gig Economy, Platform Worker, Pakistan, Smartpls, Digital Labour.

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1. Introduction

The global gig economy has experienced a radical and increasingly rapid change in the last ten years, not only in the nature of the labour markets, but in the day-to-day life of millions of employees across the globe. The gig economy, as defined by the Organization for Economic Cooperation and Development as work arrangements mediated by digital platforms that match supply and demand of labour on a task-by-task or project-by-project basis, currently includes an approximated 435 million workers in the world, with growth being especially fast in South and Southeast Asia (ILO, 2023). The country of Pakistan is in a unique position in this global phenomenon: the country has traditionally been in the top five in the world in terms of registered freelancers, with the number of registered freelancers on leading platforms, such as Upwork, Fiverr, and Freelancer.com, being significantly higher than in other countries, and the Pakistan Freelancers Association estimates that more than 1.5 million active freelancers generate about USD 4 To a nation with a long-standing unemployment issue, growing population of young people, and limited opportunities in the formal sector, platform work has become a much-needed economic safety valve that provides source of income, skills training, and entry to markets to a population that has historically been marginalized in the formal labour market (Khan et. al., 2025).

However, there is a more complicated and contentious reality underneath this story of a chance. The situation of deep structural asymmetry characterizes platform work in Pakistan elsewhere. The employees of big platforms work under the regime of governance that is not characterized by the presence of human supervisors or employment contracts but by the advanced system of algorithms that track behavior, react to performance, offer task opportunities, price, and provide disciplinary measures with a low level of transparency and almost no recourse. This is a qualitatively new type of labour governance that has broken the conventional patterns of employment law, organizational behavior, and industrial relations, and is being referred to as algorithmic management or algorithmic control (Kellogg et al., 2020; Veen et al., 2020). The concept of algorithmic control is the implementation of automated digital control with the help of machine learning, real time data analytics and artificial intelligence to command, supervise, assess and punish workers in a manner that mimics and in many ways exaggerates the roles traditionally undertaken by human management (Adil, et. al., 2021). This will include automated task assignment and pricing, real-time performance scoring, based on aggregated customer ratings, dynamic incentive and penalty schemes, and opaque algorithmic ranking systems that dictate the visibility and earning potential of individual workers in the platform context.

Algorithmics control and its implications on the wellbeing, motivation and retention of workers have received increased academic interest in recent years, especially within the organizational behavior and human resource management literatures. Several studies that have been mainly confined to North American and European settings have reported substantial relationships between exposure of algorithmic management practices and various negative worker outcomes, such as psychological stress, less autonomy, lower intrinsic motivation, and higher turnover intentions (Duggan et al., 2022; Möhlmann et al., 2021). The connection between algorithmic control and the notion of fairness is particularly relevant to the current study as it has strong connections to the organisational justice theory and has profound implications to worker engagement, compliance, and cooperation. The initial theory that was developed by Greenberg (1987) and later expounded by Colquitt et al. (2001) is the theory of organisational justice, which assumes that employees assess the equity of their employment relationships in five dimensions namely the distributive fairness of results,

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procedural fairness of decision making procedures, interpersonal fairness of authority treatment and informational fairness of explanations of decisions. Algorithms By nature, algorithmic governance is susceptible to shortcomings in various of these dimensions: the lack of transparency in algorithmic decision making processes is a threat to procedural and informational fairness; automated and unbiased enforcement frameworks is a threat to interpersonal fairness; and the lack of input by workers into pricing and rating mechanisms creates distributive fairness issues.

More recent empirical research has started to develop these theoretical connections to greater specificity. A mixed methods analysis of platform workers by Schor et al. (2023) established that the inability of algorithmic opacity workers to understand or make predictions about the principles that applied on platform decisions was the strongest salient predictor of perceived injustice in gig workers. On the same note, Gandini (2022) studied freelancers on European sites and reported on how reputation algorithms generate positive feedback loops of benefiting and disfavoring which workers believe violate the core principles of fairness but still feel powerless to challenge. Wood et al. (2022) expanded this study to platform workers in the United Kingdom, Ghana and Nigeria, where workers were more strongly affected by perceptions of algorithmic unfairness when in a lower income country setting, with fewer exit options and more reliant on platform income. In a study of ethnographic research, Katta et al. (2022) reported the use of real time algorithmic monitoring and performance-based pay formulations in creating acute procedural injustice perceptions among food delivery workers in London and Edinburgh. More recently, Rahman and Thelen (2022) examined the governance consequences of algorithmic management in various jurisdictions, and found that lack of regulatory frameworks specifically relating to algorithmic transparency plays a role in the ways that workers feel unfairly treated.

Although this is accumulating evidence, there are still considerable gaps in the literature about this subject, especially regarding the developing economies in the Global South. Most quantitative research investigating algorithmic control and perceived fairness has been done in high-income western settings, in which platform workers are generally better protected by law, have other job opportunities, and institutional remedies they can use to address perceived injustice. Such structural conditions will have a tendency to level the connection between algorithmic control and the sense of fairness in such a manner that may not be broad generalizable to lower income settings. Platform workers in Pakistan in particular work in a labour market defined by a lack of formal jobs, poor labour market institutions, limited digital literacy, and lack of platform specific regulatory frameworks. These circumstances form a unique situation where algorithmic control can work with enhanced intensity and where sense of fairness can be influenced by cultural, institutional and economic elements that are not well represented in the current Western centric models. In addition, the exact processes that algorithmic control has on perceived fairness either by observing practices and practices, automated decision making, opaque interactions, or performance rating have not been studied in the Pakistani context, which constrains policymakers and platform firms to develop contextually relevant interventions.

The paper fills these gaps through the assessment of the connection between the algorithmic control and perceived fairness among platform workers in Pakistan. Based on a primary survey of 350 active platform workers in the twin cities of Rawalpindi and Islamabad and using Structural Equation Modeling (SEM) with SmartPLS 4.0, the study provides the first large-scale quantitative study of this relationship on Pakistani soil. The research objectives and questions will be as follows:

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The paper has three objectives that are inter-related: to investigate how much and in what ways platform workers in Pakistan experience algorithmic control; to identify how much perceived fairness platform workers in algorithmically mediated workplaces in Pakistan have; and to establish what direction and of what magnitude the effect of algorithmic control on perceived fairness among platform workers in Pakistan has.

The paper will be informed by two research questions: first, how is the perception of fairness of algorithmic control related to platform workers in Pakistan? Second, what aspects of algorithmic control monitoring, automated decision making, or performance evaluation have the most significant impact on perceived fairness of workers?

The rest of this paper will be organized in the following way. Section 2 contains the approach to the methodology covering the characteristics of the sample, measurement tools, and analytical plan. The important empirical findings are reported and discussed in Section 3. Section 4 ends with a conclusion of contributions and policy implications and future research directions.

2. Research Methodology

The research design adopted in this study is a quantitative, cross sectional research design that will be done using primary data which will be gathered using a structured, self-administered questionnaire. In selecting platform workers, purposive sampling was adopted to select those who were already making revenue using the services of key digital labour markets in the forms of Upwork, Fiverr, Freelancer.com and Foodpanda during the time when the data collection took place. The study collected data during January-March 2026 in the twin cities of Rawalpindi and Islamabad, which is a strategically chosen location to conduct the study as it is a federal capital territory of Pakistan, as well as one of the most digitally active urban conurbations in the country. After the removal of questionnaires that were not completely filled or inconsistently filled, a final sample of 350 respondents was retained, which meets the minimum sample size requirements to use variance-based SEM according to Hair et al. (2022), who give a minimum of ten times the maximum number of structural paths to any latent variable. The demographics of the respondents were mostly male (78.3%), aged 18-35 (81.7%), and had been using their main platform as a platform labour force over a period of more than one year (67.4%), which is representative of the overall demographics of platform labour force in the country as reported in national surveys (PFA, 2023).

The questionnaire tool had two large sections that represented the main variables of the study. The independent variable, algorithmic control, was operationalized based on a 16item scale based on the Algorithmic Management Scale created by Duggan et al. (2022) with four sub dimensions: (1) monitoring intensity (4 items) which measures the degree to which workers feel constantly monitored by automated systems; (2) automated decision making (4 items), which measures the degree to which platform decisions affecting workers are made without human The dependent variable was perceived fairness, which was measured based on a 12item scale that was adapted to an Organisational Justice Scale created by Colquitt (2001), and later validated by Möhlmann et al. (2021), covering distributive, procedural, interpersonal, and informational sub dimensions. Each of the items was measured on Likert scale (strongly disagree) to strongly agree), with reverse coding used when appropriate on items which were negatively phrased.

Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to analyze the data in SmartPLS 4.0. PLS-SEM was chosen over covariance-based SEM due to its appropriateness to exploratory research with reflective measurement models, its ability to withstand non normality in sample distributions, and its ability to deal with moderate number

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Vol. 4 No. 4 (2026)

of indicators used to measure constructs (Hair et al., 2022; Ringle et al., 2023). To measure the internal consistency reliability (Cronbachs Alpha 0.70; Composite Reliability 0.70), convergent validity (Average Variance Extracted [AVE] 0.50) and discriminant validity (HTMT 0.85), the measurement model was evaluated. Path coefficients, coefficient of determination (R^2) and bootstrapped t statistics were used to evaluate the structural model (5, 000 bootstrap samples, two tailed, significance level $p < 0.05$). Harman one factor test and the marker variable technique were used to measure common method bias and no cases of unproblematic bias were found. All constructs were above the set standards of reliability and validity, which validated the psychometric suitability of the measurement tool in the Pakistani context.

3. Results and Discussion

3.1 Measurement Model Assessment

The measurement model showed good reliability and validity of all constructs. The values of Alpha of Cronbach of the sub dimensions of algorithmic control were 0.78-0.89, and the perceived fairness sub dimensions were 0.76-0.87, and these are above the recommended value of 0.70 (Hair et al., 2022). The Composite Reliability (CR) was between 0.83 and 0.91 which once again affirms internal consistency. AVE values were between 0.52 and 0.67, which meets the convergent validity threshold of AVE 0.50 and above (Fornell and Larcker, 1981). The discriminant validity was verified with the help of HTMT ratios, all of which were less than the conservative value of 0.85, which means that the constructs represent sufficiently different empirical domains. Factor loadings of each of the individual items were above 0.60, most of them above 0.70 indicating sufficient indicator reliability. The overall outcome of these results is that the measurement tool is functioning reasonably well in the Pakistani platform worker setting, and that it offers a good foundation upon which the interpretations of the structural model can be based.

3.2 Descriptive Statistics and Preliminary Analysis

Descriptive analysis showed that respondents who participated in the survey had moderate to high perceived algorithmic control. Means on the algorithmic control scale were 3.71 (SD =.84) which suggested that most of the respondents had algorithmic governance as a ubiquitous aspect of their platform work. The sub dimension of algorithmic control with the most significant mean score ($M = 3.94$, $SD = 0.79$) was the most common aspect of algorithmic control to be reported in qualitative descriptions: many Pakistani freelancers are frustrated by the inability to understand how ranking and rating algorithms operate on the platform (Ashraf, 2022). Monitoring intensity was rated second highest ($M = 3.82$, $SD = 0.91$), followed by automated decision making ($M = 3.68$, $SD = 0.87$) and performance evaluation ($M = 3.44$, $SD = 0.93$). Perceived fairness scores were also significantly lower and had an average of 2.61 ($SD = 0.94$) in the entire scale which means that most of the respondents felt that the work of the algorithmic governance of their platform was unfair. The distributive fairness received the least mean score ($M = 2.43$, $SD = 1.01$), which implies that workers were especially not satisfied with the results that were produced by algorithmic systems such as earnings and tasks assignments. Procedural fairness ($M = 2.56$, $SD = 0.97$), informational fairness ($M = 2.67$, $SD = 0.89$) and interpersonal fairness ($M = 2.79$, $SD = 0.92$) ranked a little higher, but still lower than the midpoint of the scale, suggesting that most perceived fairness on all dimensions of justice to be negative.

3.3 Structural Model Results

The perceived fairness construct had a coefficient of determination (R^2) of 0.497 with algorithmic control which means that approximately 49.7 per cent of the variance in perceived fairness is explained by algorithmic control which is a substantive result as defined in the PLS-

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Vol. 4 No. 4 (2026)

SEM literature (Hair et al., 2022). The total direction coefficient between algorithmic control and perceived fairness was -0.704 (-0.704, t = 18.32, p = 0.001) which affirms that there is strong, statistically significant and negative correlation between the two constructs. This key result suggests that the higher the degree of algorithmic control, the lower the perceptions of fairness among Pakistani platform workers which helps to confirm the main hypothesis of the study.

Analysis of subdimension effects showed significant difference on the four components of algorithmic control. Algorithmic opacity exerted the strongest negative effect on perceived fairness (β = –0.421, t = 11.74, p < 0.001), followed by automated decision making (β = –0.318, t = 9.06, p < 0.001), monitoring intensity (β = –0.267, t = 7.83, p < 0.001), and performance evaluation (β = –0.198, t = 5.12, p < 0.001). Algorithms dominance as a predictor is theoretically aligned with procedural and informational theory of justice, which hold that the perception of fairness among the workers is highly determined by the sufficiency of explanations made towards the consequential decision (Colquitt, 2001). When employees are not made aware of why a platform has given them a lower score, decreased their visibility in tasks or changed their rate of earnings, they do not have the informational preconditions needed to create judgements of procedural fairness that create what Möhlmann et al. (2021) called justice vacuum in algorithmically controlled contexts.

3.4 Discussion and Comparison with Extant Literature

The current results provide support as well as contextuality regarding the current international literature on algorithmic control and perceived fairness. The significant negative correlation between algorithmic control and perceived fairness is also in line with the results documented by Duggan et al. (2022) in the Irish platform labour environment, by Gandini (2022) among European freelancers, and by Wood et al. (2022) among UK, Ghanaian, and Nigerian platform workers. Nevertheless, the effect size observed in the current study (β = -0.704) is significantly larger than the effects reported in similar studies in the West (usually -0.45 -0.55), and the negative implications of fairness of algorithmic control may be even more pronounced in the Pakistani context due to the structural factors such as the lack of an effective exit, the absence of strong institutional guarantees, and the increased economic

The discovery that algorithmic-opacity is the most consequential aspect of algorithmic control in the perception of fairness is a particularly valuable addition. This finding is in line with Schor et al. (2023), who also found that the most common mechanism between the perception of algorithmic governance and worker injustice in the US context is the concept of opacity, and Rahman and Thelen (2022), who contended that the most manageable regulatory instrument to enhance fairness in platform labour markets is the idea of algorithmic transparency. The equity cost of obscurity is likely to be magnified in the Pakistani environment where workers are frequently unable to get customer support in their native language and do not have digital literacy tools and resources to decode platform communication. The implication of this finding is that disclosure interventions such as the use of clearer explanations of the algorithm, the availability of it, and the use of plain language performance feedback can have disproportionately large fairness payoffs in developing economy contexts.

The research results of the intensity of monitoring are also of great importance. The strong adverse influence of the intensity of monitoring on the perceived fairness (= -0.267) is in accordance with the previous ethnographic and qualitative studies on the Pakistani platform workers carried out by both Ashraf (2022) and Anwar and Graham (2022), who reported a high level of worker distress associated with the perception of constant algorithmic

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Vol. 4 No. 4 (2026)

monitoring. Nonetheless, the quantitative scale of this effect is slightly less than might be expected given the salience of surveillance in qualitative explanations, indicating that Pakistani platform workers might have normalized surveillance to a certain extent as an inevitable aspect of platform work a trend also visible in the study of Australian food delivery workers that Veen et al. (2020) conducted, who reported a process of algorithmic resignation in which workers were no longer resistant to

The observation that, although statistically significant, the performance evaluation has the least impact on perceived fairness (= -0.198) could be due to the dual nature of performance systems in the fairness cognitions of workers. Although ill constructed evaluation systems plainly give rise to a sense of injustice, well constructed rating systems also afford workers a type of reputational currency that they prize and which they use to generate income. This ambivalence can mitigate the overall negative impact of performance evaluation on fairness perceptions a possibility that Möhlmann et al. (2021) also found that workers differentiate between fairness in the results of evaluation and legitimacy in the evaluation processes, and the latter has a stronger determinative influence on justice overall.

Combined, the findings of the study will give strong quantitative support that algorithmic control is a systematic threat to perceived fairness on the platform labour market in Pakistan, and that this threat is most powerfully realized via the obscurity of algorithmic decision making. The implications of such findings are profound in the context of designing platform governance systems, shaping labour market regulation, and the overall academic knowledge of algorithmic work in developing economy settings.

4. Conclusion and Policy Implications

This paper explored the connection between algorithmic control and perceived fairness of platform workers in Pakistan, which was the first large-scale quantitative study of this connection in a developing economy setting in South Asia. Based on primary survey data of 350 platform workers and using PLS-SEM, the research study has established that there is a significant negative impact of algorithmic control on perceived fairness that is supported by the empirical evidence (1 = -0.704, 2 = 0.497). Out of the scales of the algorithmic control, the concept of opacity proved to be the most dominant predictor of unfairness perceptions, followed by the automated decision making, monitoring intensity, and performance evaluation. The results align with and in key aspects expand the existing international research on algorithmic management and organisational justice in platform work settings.

The paper is threefold in its contributions. In theory, it offers quantitative confirmation of the relevance of organisational justice models to the context of algorithmic controlled platform work in a developing economy, as well as marks algorithmic opacity as a particularly consequential aspect of the algorithmic control fairness relationship. Methodologically, it reveals how PLSSEM can be used to conduct latent construct analysis in the research of platform worker survey. It empirically provides strong baseline evidence on algorithmic control and perceived fairness in the gig economy of Pakistan, which can be used to conduct longitudinal and comparative studies.

These findings have important policy implications. Azmat, et. al., (2025) founded that in the case of platform companies in Pakistan, the results advise investment in the algorithmic transparency mechanisms such as clear, accessible and timely explanations of consequential platform decisions like rating changes, earnings changes, and account restrictions. The creation of localized and linguistically accessible communication channels with workers, the creation of effective and receptive appeals mechanisms and the code sign of performance evaluation criteria including worker input are all reported to be fairness enhancing

interventions with probable positive impacts on worker retention, engagement and performance.

The results underscore the need to have a regulatory framework that is directly targeted at the algorithmic transparency and responsibility in the platform labour market in Pakistan, to the policymakers. Devoid of sector specific regulation, platforms will not have significant legal motivation to adopt fairness enhancing actions and workers will lack institutionally accessible tools to object algorithms as deployed in the decision-making process. The Ministry of Information Technology and Telecommunication, along with the National Freelancing Commission, which was established in 2022, should consider the establishment of Algorithmic Accountability Framework to digital labour platforms, which enforces a minimum level of transparency, has a system of providing redress to grievances against workers that is legally enforceable, and incentives to encourage digital labour platforms to institute human in the.

The current analysis can be continued in various ways in future research. It requires longitudinal research to investigate whether the relationships observed here will continue over time as the platform labour market in Pakistan matures and as workers become more algorithmically literate. Comparative analysis of the platform worker conditions in various South Asian economies such as India, Bangladesh and Sri Lank a would help in gaining a more subtle insight into the structural and institutional moderators of the relationship between algorithmic control and fairness. The mixed and qualitative research examining the experience of algorithmic control among various subgroups of Pakistani platform workers such as women, rural workers, and those in lower skilled job categories would add to the largely quantitative approach that the current research provides. Lastly, intervention research assessing the fairness impact of individual transparency improving platform design interventions would offer the causal evidence base needed to inform evidence-based policy and platform governance reform.

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