

Letting the Cheaters Always Win: The Scantiness of Public Policy to Curb Cheating in the Academic Settings

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Although academic dishonesty in Pakistan's institutions of higher learning evinces pervasiveness but quantitative research on efficacy of its control mechanism is nominal. This study empirically examines the mechanism adopted for controlling academic dishonesty in Pakistan. The study makes use of 'panel data' compiled by a large public sector University in Pakistan from 2012 to 2017. Classifying the policy variables in four sub-categories and using rigorous regression analysis, the attained results indicate that no variable, representing probability of detecting acts of academic dishonesty, influences cheating during examinations. The variables representing severity/certainty of sanctions are, however, negatively associated with cheating. The study further deliberates on weaknesses of the conventional policies and recommends some guidelines to make them more useful for curbing academic dishonesty in Pakistan.

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1. INTRODUCTION

Academic Dishonesty (AD hereafter) is an umbrella term used for a range of students' deceptions related to gaining undue advantage during evaluations and examinations (Šorgo et al., 2015). The specific range of misbehaviors considered AD may vary from country to country¹ but could broadly be classified into two categories; plagiarism and cheating. Plagiarism means claiming someone else's work as one's own (Thomas, 2017). Cheating can be further classified as social active, social passive and independently planned. Cheating is social active when a student copies answers from another student without his/her consent/knowledge (e.g., copying from other students over the shoulder); and is social passive when the other student cooperates (e.g.,

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¹For instance, getting unauthorized information about an exam from someone who previously took it is considered an act of AD in most countries (e.g., see Minarcik & Bridges, 2015) but the widespread availability of previous question papers in the book stores in Pakistan implies that it is not considered AD in Pakistan.

exchanging work with others). Independently planned cheating is a form of cheating in which a student reproduces answers from other sources (such as crib notes) during an examination (Garavalia et al., 2007).

The magnitude of AD around the world – as depicted in Table 01 below - signifies the fact that it is considered a victimless crime calling for less immediate attention of the policy makers.² However, it is not. In standard economic jargon, AD (especially cheating) is a pure public good–having the characteristics of non-rivalry³ and non-excludability;⁴ and the cheater is a free-rider.⁵ AD and the associated free-riding has indeed several economy-wide adverse consequences (Hodgkinson et al., 2016). First, the successful free rider secures higher marks than he or she deserves without learning the material and hence under-production of knowledge occurs (Bunn, Caudill & Gropper, 1992; Reisig & Bain, 2016). Accordingly, academic institutions fail to produce productive human capital for the economy (Dee & Jacob, 2010; Bretag, 2013). Secondly, if the free-rider and an honest student obtain equal marks, competition distorts and incentives for honesty diminish. Given this, the honest students might consider it optimal to cheat to level the playing field. AD, in this sense, has a contagious effect by making free-riding attractive even for the honest students (Dee & Jacob, 2010; Sattler, Graeff, & Willen, 2013 and Fendler & Godbey, 2016).

Table 01

Incidence of AD in Various Countries

Study	Type of AD	Sample Size	Magnitude (%)	Country
Curtis & Popal (2011)	Plagiarism	120	74	Australia
Hughes & McCabe (2006)	General AD	14913	64	Canada
Ma, McCabe & Liu (2013)	General AD	1097	83	China
Dickhoff et al., (1999)	Cheating on Exams	276	55	Japan
Park et al., (2013)	Plagiarism	655	44	Korea
Ismail & Yussof (2016)	Cheating on Exams	435	65	Malaysia
Osisioqu & Mamman (2017)	Cheating on Exams	399	52	Nigeria
McCabe (2005)	Plagiarism	2294	64	North America
Nazir & Aslam (2010)	Cheating on Exams	958	60	Pakistan
Tayaben (2014)	Plagiarism	36	39	Philippines
Sorgo et al., (2015)	General AD	323	91	Slovenia
Theart & Smit (2012)	Plagiarism	550	60	South Africa
Lin & Wen (2007)	Plagiarism	2068	64	Taiwan
Young (2013)	Cheating on Exams	106	12	Thailand
O’Sullivan (2014)	General AD	25	92	UAE
Fendler & Godbey (2016)	Cheating on Exams	23000	51	US

Source: *Literature survey.*

²This generalization is facilitated by the research conducted by Sattler, Wiegel & Veen, 2017 to whom the widespread prevalence of AD is the result of insufficient use of the policy to control it.

³Cheating is rival only if the grading system is relative but not otherwise, e.g., students still have their answers if others copy from them (Bunn, Caudill & Gropper, 1992).

⁴Social active and social passive cheating is excludable but is costly, e.g., making multiple versions of an exam, increasing the number of invigilators and keeping appropriate distance between seating can exclude a cheater from copying but all methods are costly in terms of either time, resources or energy.

⁵A person who enjoys the benefits of a public good (e.g., passing exams via cheating) without contributing to the cost of production (e.g., studying). It is a reasonable strategy for individuals in the absence of penalties and provided that the strategy is chosen by few individuals (Hyman, 2014).

Thirdly, marks obtained are usually used by employers as a signal of command over the subject(s), and to differentiate productive job applicants from less-productive job applicants (Spence, 2002; Happel & Jennings, 2008; & Page, 2010). The employers, however, would not be able to do so if. Due to the prevalence of AD, part of the marks obtained represent successful cheating.⁶ The masked worker would nevertheless be exposed when the candidate starts working according to his/her skills (as opposed to the distorted information conveyed by marks obtained). Besides producing less than expected output, this would ultimately devalue the degree and will ruin the reputation of the degree awarding institution (Happel & Jennings, 2008; Bretag, 2013 & Whitten & Swank, 2017).

In the fourth place, the literature about habit persistence suggests that successful cheaters in academia carry over their misbehavior to the job market (Sorgo et al., 2015; Saana et al., 2016; Blau et al., 2018). Perhaps this is the most shocking common result reported in empirical research (Cronan et al., 2017; Freiburger et al., 2017; Boyle, Boyle & Carpenter, 2017). Besides, McCabe, and Trevino (1996) and Rakovski and Levy (2007) believe AD to be a symptom of more pronounced problems, like misguided morality. Indeed, a scant body of empirical literature has proved that AD relates positively with shoplifting (Beck & Ajzen, 1991), alcohol abuse (Kerkvliet, 1994), tax evasion (Nonis & Swift, 2001) and general criminality (Williams & Williams, 2012; Fendler, Yates, & Godbey, 2018).⁷

Empirical research in the area highlights serious prevalence of AD in Pakistan. The study of Rehman and Waheed (2014) reported that 90 percent of their sample respondents consider AD as the normal way of life in Pakistan (See also the study by Ghias et al., 2014 for similar findings amongst the medical students of Pakistan).⁸ The research, however, is silent on the effectiveness of the control mechanism of AD in Pakistan, an area of research that is of paramount importance given the adverse consequences of AD. Relevant research conducted in the Western developed world may not be applicable to the developing countries' problems because of differences in culture, motivation (Lin et al., 2013), mind-set (Dweck, 2010), and education system (Thomas, 2017). Developing indigenous and data driven insights regarding the controllable determinants can help educators and policymakers to devise/revise strategies for controlling AD. Hence, the primary aim of this research is to empirically evaluate the efficacy of the policies adopted for controlling AD in

⁶The employer is unaware of the private information of how much of the obtained marks represent the ability of the job applicant to cheat without being detected and punished. This is a classic example of the asymmetric information problem which results in economic inefficiency.

⁷Besides these stated consequences of AD, Hodgkinson et al., (2016) lists other costs of AD which include the monetary costs of processing cases of AD, the career and lifetime earning costs of those students found guilty and terminated and the emotional and psychological costs to students, faculty and parents.

⁸Besides these research studies, other high-profile reports (e.g., the report by Ullah & Zia (2016) on leaked medical and dental colleges entrance test, Yusufzai (2018) report on cancellation of medical and dental colleges entrance test due to confirmed leakage of the test, and Walsh (2015) report in New York Times regarding the high impact Axt scandal suggest that AD in Pakistan is more pronounced than usually considered.

Pakistan. This exercise is expected to serve as a model for future related studies in other universities, since it is believed that the type of data utilized in this study is compiled by all the major public sector universities of Pakistan. The rest of the paper is structured as follows: previous theoretical and empirical literature associated with the deterrence policies is briefly discussed in section 2. Section 3 describes data and the methodology used in the study. Results and their subsequent discussion takes place in section 4. Section 5 concludes the paper and, based on the findings, also discusses policy prescriptions for controlling AD in Pakistan. Section 6 is added at the end to facilitate future research and to reflect on the limitations of the present study.

2. THEORETICAL BACKGROUND

AD is either studied from the perspective of individual traits (Lambert & Hogan, 2004; Lanier, 2006; Ogilvie & Stewart, 2010 & Wray et al., 2016), deterrence, or as a rational choice. The policies for controlling AD around the world are, however, based on insights obtained from either deterrence theory or the rational choice theory.⁹ Table 02 below highlights major acts of AD (except plagiarism) and part of its control mechanism at the source university and its constituent colleges as representative strategy stemming from the two theories.¹⁰ The theories consider AD like any other crimes¹³. There are specific arrangements for student seating during exams where proctor(s)/teacher(s) patrol to detect and report acts of AD (i.e., target hardening). Once an act of AD is detected and reported, there are procedures (usually decided by the committees related to students' misconduct) to prosecute and impose sanctions on the accused students if found guilty (Caudill & Mixon, 2005).

The rational choice perspective considers the dichotomous choice of remaining honest or being involved in acts of AD just like any other criminal choice (Michaels & D Mieth, 1989). Students have a rough approximation of the consequences resulting from acts of AD (Woessner, 2004). These consequences include benefits (e.g., avoiding failures, higher marks obtained, getting admission in institutes of high reputation/professional colleges, and increased probability of getting a job once education completes) and costs (e.g., punishment if detected).¹¹ The costs are, however, uncertain, and a dishonest student needs to be detected and proven guilty for the costs to be imposed (Bunn, Caudill & Gropper, 1992). Hence students must assess the perceived risks of punishment against the perceived benefits of AD (Rettinger, 2007) and are likely to act dishonestly if the perceived benefits outweigh the perceived costs (Becker, 1968).

⁹Universities' policies regarding AD typically list definitions of AD and prescribed punishment along with procedures as given in Table 02 (see Hodgkinson et al., 2016).

¹⁰However, Bunn, Caudill & Gropper (1992) have developed cases to argue that AD is entirely different from other types of [property] crimes.

¹¹Costs associated with AD, as mentioned here, include institutional responses in the form of prescribed penalties. There are, however, more important costs associated with the acts of AD triggered by shame (i.e., disapproval of the acts by teachers, classmates and parents) and personal guilt (e.g., see Murdock & Stephens, 2007 and Ullah, 2018).

Table 02

A Representative List of the Acts of AD and Prescribed Penalties

Acts of Unfair Means		Prescribed	Fines (Rs.)			
1	Attempt of Copying		1500			
2	Appealing for sympathy of the examiner in the answer sheet		2000			
				Paper		
3	Copying from crib notes		2000	Cancelled		
4	Copying from mobile phones/other electronic devices		4000	Cancelled		
5	Removal of sheet(s) from the answer book		2500	Cancelled		
6	Using abusive language in the answer sheet		2000	Cancelled		
7	Staging a walkout or persuading others to do so from the examination hall				Exam	
			5000	Cancelled	Cancelled	
8	Deceiving the supervisory staff		5000	Cancelled	Cancelled	
9	Smuggling of question paper outside the hall		10000	Cancelled	Cancelled	
10	Resistance to hand over cheating material to supervisory staff		3500	Cancelled	Cancelled	
						Disqualification
11	Smuggling answer book out of the hall	10000	Cancelled	Cancelled	Next three exams	
12	Threatening the supervisory staff	7000	Cancelled	Cancelled	Next three exams	
13	Impersonation	15000	Cancelled	Cancelled	Next three exams	

Note: While the list of acts of unfair means across the universities of KP-Pakistan is almost the same, the prescribed penalties differ in minute details.

The model(s), based on the rational choice perspective, implies that students are likely to act dishonestly if; (1) perceived net benefits from dishonesty are positive or, (2) perceptions of undetected AD are pronounced and (3) perceived punishment associated with acts of AD are uncertain and less severe (Murdock & Stephens, 2007; Rosenbaum, Billinger & Stieglitz, 2014). These insights of the perspective are the subject of a massive body of empirical literature (some of the recent findings are appended in Table 03 below). Most of the empirical findings are in line with the implications of the rational choice perspective.

Table 03

Expected and Empirical Impact of the Explanatory Variables on AD

Variables	Expected	Empirical Findings	
		Expected	Null or unexpected
Probability of Detection	Negative	Bisping, Patron, & Roskelley, 2008; Burrus et al., 2013; Corrigan-Gibbs et al., 2015; Freiburger et al., 2017; Ma, McCabe & Liu, 2013; McCabe et al., 2006; Minarcik & Bridges, 2015; Nagin & Pogarsky, 2003; Ogilvie & Stewart, 2010; Rigby et al., 2015 and Sattler et al., 2013.	Tibbetts & Myers, 1999.
Certainty/Severity of Sanctions	Negative	Bisping, Patron, & Roskelley, 2008; Curran, 2016; Corrigan-Gibbs et al., 2015; Ismail & Yussof, Freiburger et al., 2016; Ma, McCabe & Liu, 2013; Minarcik & Bridges, 2015; Ogilvie & Stewart, 2010 and Pogarsky, 2003 and Sattler et al., 2013.	Way, 2011.
Gains from AD/Stacks in Conformity*	Negative	Burrus et al., 2007; Curtis & Popal, 2011; Jackson et al., 2002; and Ma, McCabe, & No study found Liu, 2013.	
Gender (Male)	Positive	Ismail & Yussof, 2016; Jackson et al., 2002; Kisamore, Stone, & Lambert & Hogan, 2004; Lanier, 2006 and Jawahar, 2007 and Ogilvie & Stewart, 2010.	Sorgo et al., 2015.

**The reported results are for GPA which is usually used for benefits from AD.*

3. DATA AND METHODOLOGY

3.1. Data

Empirical research on AD is predominantly based on self-reported surveys where involvement in the acts of AD are recorded as responses to directly asked questions or using other sophisticated designs like the one proposed by Prelec (2004). Data obtained from such surveys, however, may not be accurate due to reference bias (Groot, 2000), memory decay (Fox, Nobles & Lane, 2016), casual error that results from temporal ordering (Silberman, 1976), complexity of the design (Caudill & Mixon, 2005) and most importantly, due to social undesirability bias (Holbrook, Green, & Krosnick, 2003). Observational studies provide an alternative but cannot be used for evaluating the most common types of AD (Fendler, Yates, & Godbey, 2018).

Official reports of the instances of AD are yet another alternative but are the least frequently used source of data for understanding the dynamics of AD (Minarcik & Bridges, 2015),¹² the obvious reason being under-reporting in these statistics (Nitsch et al., 2005). Under-reporting is, however, not specific to official statistics and is also found in studies based on self-reported data (West, Ravenscroft, & Shrader, 2004). Moreover, under-reporting in the context of regression analysis is no problem if it is constant overtime and across space (Eide, Rubin, & Shepherd, 2006). Likewise, it can be argued that reported statistics on AD is the only type of data that provides diversity—in terms of population, disciplines and types of AD studied—as opposed to the discipline/acts specific studies routinely conducted. The study, thus, uses official data compiled by a large public

¹²Perhaps the only published study using official statistics on AD in the last two decades is the study conducted by Olafson, Schraw & Kehrwald, 2014.

sector university in Pakistan for the period from 2004 to 2017. There were, however, only 16 examination centers/affiliated colleges back in 2004 which increased to 111 in 2017. To make the panel balanced, the data set used in subsequent analysis includes 60 undergraduate level examination centers and the period covered is from 2012 to 2017.

3.2. Empirical Specification

An intuitive model of the decision to involve in the acts of AD based on the rational choice perspective shall include perceived costs and benefits of the acts (Woessner, 2004). The perspective, that AD is preferred to honesty if net benefits of doing so are positive, can be specified mathematically as;

$$E(B) - E(C) > 0 \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

Where E(B) stands for expected benefits associated with acts of AD, and E(C) are the expected costs defined in the following equation (Fendler & Godbey, 2016);

$$E(C) = (P_d)(P_{r/d})(P_{s/r/d})(S) \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

P_d in equation (2) is the probability of detection, $P_{r/d}$ is the probability of being reported for the acts of AD conditional on being detected, $P_{s/r/d}$ is the probability of the associated sanctions inflicted upon conditional on both detection and reporting; and S is the magnitude/severity of the imposed sanction(s).

Predictions from the rational choice perspective implies that variations in E(B) and E(C) shall have the following effects on AD:

$$\frac{\partial AD}{\partial E(B)} > 0 \text{ and } \frac{\partial AD}{\partial E(C)} < 0 \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (3)$$

Manipulating E(B) by the policy makers, however, may not be as easy as manipulating the E(C), the precise reason why most empirical research focuses on E(C). Since E(C) are directly associated with the probability measures, and taking E(B) as given, the empirical specification that follows can be given as:

$$AD_{it} = \alpha_0 + \beta_1 PD_{it} + \beta_2 SS_{it} + \beta_3 ZY_{it} + \beta_4 G_i + U_{it} \quad \dots \quad \dots \quad \dots \quad (4)$$

Variables listed in equation (4) are explained in Table 04 below. Further, keeping in view the nature of data and as dictated by diagnostic tests discussed in Section 04 below, equation (4) is estimated as Fixed Effect Model (FEM).

3.3. Variables and Measures

Table 04 below enlists variables used in the analysis and their measures. As mentioned at the very beginning, AD is an umbrella term used for a range of misbehaviors in the academic settings. The measure used in this study to represent AD is per capita reported Unfair Means (UFM) cases during examinations listed in Table 01 above.¹³ Probability of detection is further divided into two sub-categories: per capita

¹³The measure used for the dependent variable AD relates to cheating or attempted cheating during examinations. But, given the stability of such behaviors horizontally and vertically, the analyses are equally useful for understanding the dynamics of plagiarism in the institutes of higher learning.

invigilators and per capita inspections.¹⁴ Likewise, severity of punishment is also divided into two parts: per capita fines and per capita other sanctions. The severity of punishment could also be interpreted as certainty of punishment. The calculation of the measure used for monetary sanctions is straight forward as given in the table. The “other sanctions” variable is constructed by assigning different values to various sanctions according to their severity (from 5 down to zero),¹⁵ and then adding together the assigned scores for the i^{th} hall and t^{th} year. The number is then divided by the total number of reported UFM cases to derive the per capita value of other sanctions.

Table 04

Variables and Measures

Variables	Proxy	Measure
Academic Dishonesty	AD_{it} Per Capita Reported UFM	Number of total reported UFM cases from the i^{th} hall in the t^{th} year divided by the total number of students appeared in the exam in the i^{th} hall and t^{th} year
Probability of Detection	PDI_{it} Per Capita Invigilators	Number of total invigilators in the i^{th} hall and t^{th} year divided by the total number of students appeared in the exam in the i^{th} hall and t^{th} year
	PDS_{it} Per Capita Inspections	Number of total inspections in the i^{th} hall and t^{th} year divided by the total number of students appeared in the exam in the i^{th} hall and t^{th} year
	SSM_{it} Per Capita Fines	Total fine (in thousands of Rs.) imposed on the i^{th} hall in the t^{th} year divided by the total number of reported UFM cases in the i^{th} hall and t^{th} year
Certainty/Severity of Punishment	SSO_{it} Per Capita Other Sanctions	Number of students in the i^{th} hall and t^{th} year whose paper(s)/Exams are cancelled divided by the total number of reported UFM cases in the i^{th} hall and t^{th} year
Gains from AD/Stacks in Conformity	Y_{it} Ratio of regular to private students	Number of regular students in the i^{th} hall and t^{th} year divided by the number of private students in the i^{th} hall and t^{th} year
Gender	G_i Binary	$G = 1$ if the i^{th} hall is a male hall and 0 otherwise.

¹⁴The probability and certainty/ severity measures can best be described as objective measures of these magnitude. The subjective counterparts are the ones perceived by the individual students and may be more relevant for such an analysis (Nagin, 2013 and Sloan et al., 2016). It is, however, assumed that objective and subjective measures correlate positively (Pickett et al., 2016 and Pogarsky et al., 2017).

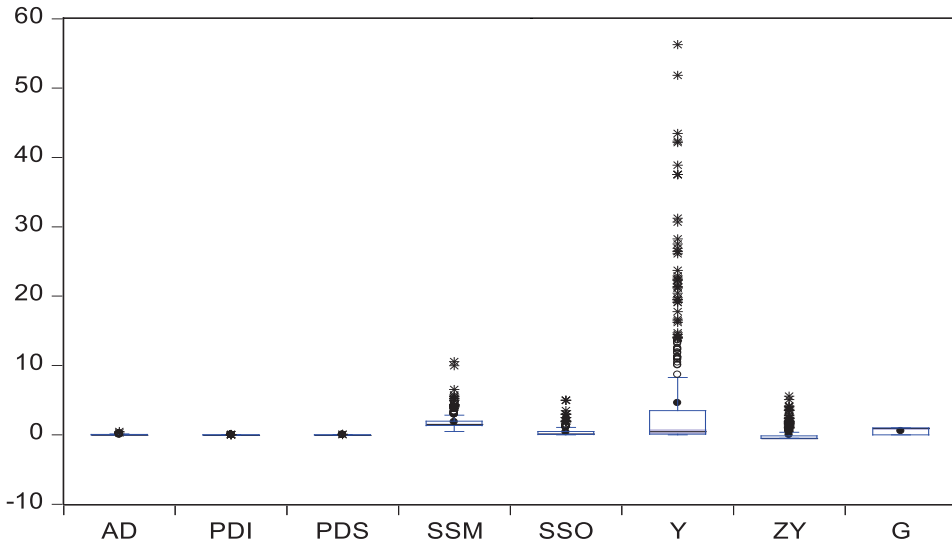
¹⁵More precisely, the most severe non-monetary sanction at the source university's examination bylaws is the one in which a candidate found guilty of AD is disqualified for the next three examinations and his or her current examination is also cancelled (=5). The least severe non-monetary sanction in the bylaws is when the reported case is let-off without any sanction (=0).

In empirical literature, Grade Point Average (GPA) is usually taken as a proxy for benefits from cheating/stacks in conformity. Individual students having higher GPA are likely to gain less and lose more, if caught involved in acts of AD (Bunn, Caudill & Gropper, 1992).¹⁶ This line of reasoning, however, may be flawed if the acquired higher GPA reflects expertise in cheating. To do away with such flawed reasoning, this study uses the ratio of regular to private students (Y_{it}) which is arguably a superior measure than GPA. Regular students invest more (in terms of time and resources) in education and should, in principle, lose more if caught cheating as compared to private students. Moreover, Whitley's (1998) review of 107 articles also suggests that having moderate expectations of success, studying under poor conditions and anticipating a large reward for success are the strongest correlates of cheating. All these characteristics are common to private students in Pakistan and, hence, private students are likely to lose less if caught cheating.

4. RESULTS AND DISCUSSION

Before formal analysis, the box plot and the descriptive statistics, given in Figure 01 and Table 05 respectively, reveal quality of the data used in subsequent analysis. On first look, it can be observed that while most of the variables are not normally distributed, the probability of rare events/outliers is the greatest in Y_{it} (i.e., having minimum and maximum values far away from the mean and having a large variance). To take care of its adverse impact on the results, Y_{it} is converted to standard normal units.¹⁷ Similarly, the correlation matrix of the explanatory variables reported in Table 06 below shows that none of the variables are linearly correlated to cause problems in regression estimation.

Figure 01 Box plot of the variables



¹⁶The pursuit of higher GPA, however, is also found to be a motivating factor behind acts of AD (e.g., see Saana et al., 2016).

¹⁷The formula used for standard normal transformation is; $ZY_{it} = [Y_{it} - \bar{Y}]/s_y$.

Table 05

Descriptive Statistics of the Variables

Variables	Obs.	Mean	Maxi	Mini	St. Dev.	Skew	Kurt	J-B
AD	360	0.047	0.484	0.0009	0.053	2.725	16.742	3278.83*
PDI	360	0.017	0.074	0.003	0.007	2.439	14.464	2328.34*
PDS	360	0.017	0.111	0.001	0.010	2.633	22.124	5902.27*
SSM	360	1.884	10.571	0.500	1.110	3.531	22.139	6243.25*
SSO	360	0.441	5.000	0.011	0.683	3.790	21.219	5840.96*
Y	360	4.602	56.285	0.007	9.254	2.728	10.892	1380.98*
ZY	360	5.5E-08	5.584	-0.496	1.000	2.728	10.892	1380.98*
G	360	0.580	1.000	0.000	0.494	-0.326	1.106	60.1704*

Note: The steric (*) represent statistical significance at 1 percent level.

Table 06

Correlation Matrix of the Predictor Variables

Correlation t-statistics	PDI					
PDI	1.000	PDS				
	–					
PDS	0.480	1.000	SSM			
	10.360*	–				
SSM	0.024	0.047	1.000	SSO		
	0.455	0.891	–			
SSO	-0.095	-0.160	0.400	1.000	ZY	
	-1.809	-3.080*	8.278*	–		
ZY	0.115	0.133	-0.072	-0.019	1.000	G
	2.190	2.54	-1.380	-0.367	–	
G	-0.073	0.253	-0.010	-0.113	0.109	1.000
	-1.397	4.950*	-0.191	-2.157	2.078	–

Note: The steric (*) represents statistical significance at 1 percent level.

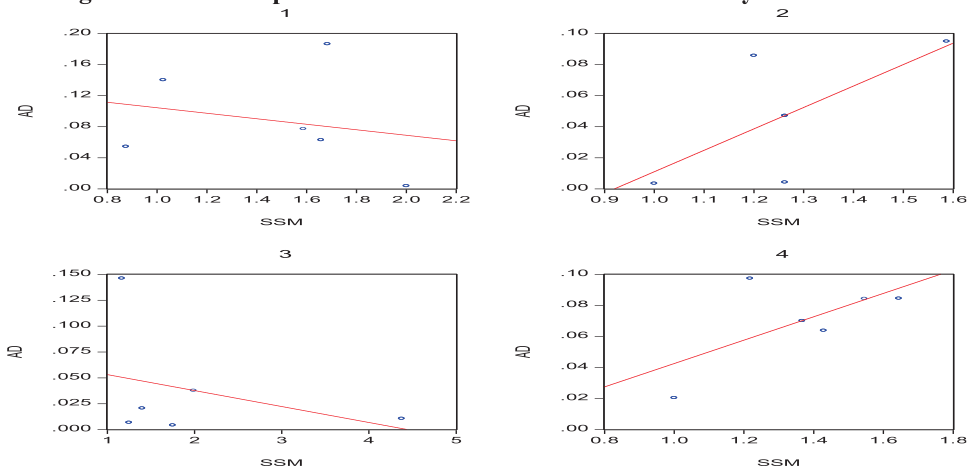
To explore the nature of the panel data set for formal analysis, Table 07 below reports results of several tests. Firstly, the panel is tested for cross-sectional and period heteroskedascity. Clearly, the null hypothesis of cross-sectional homoskedascity is rejected but not the period homoskedasticity. The panel heterogeneity test checks whether pooled OLS or FEM is appropriate for estimating the model. The null hypothesis of the test can be stated as: “there is no cross-sectional and/or time-wise heterogeneity in the model”. The results reported in the table clearly indicate that there is cross-sectional as well as period-wise heterogeneity and, hence, FEM is better than the pooled OLS.

Table 07

Diagnostic Tests/Tests for Exploring the Panel

Test	Value	Probability
Panel Cross-section Heteroskedasticity LR Test	279.9531	0.0000
Panel Period Heteroskedasticity LR Test	30.6865	0.9994
Panel Heterogeneity Test	Cross-section F	3.9028
	Period F	3.3092
Cross-section dependence Test (Breusch-Pagan LM)	2374.847	0.0000
Hausman Test	90.7210	0.0000
Durbin-Wu-Hausman Test	Resid-PDI	-10.6867
	Resid-SSM	-0.0078

It is advisable to test for cross-sectional dependence in the panels having a large cross-sectional dimension. The results of this test are given in row 05 of Table 07 where the null hypothesis of the test is that the disturbances are cross-sectionally independent. This assumption is crucial for the application of REM but is not required in FEM (Baltagi, 2008). The results of the Breusch-Pagan LM test reveal that the assumption of no cross-sectional dependence is clearly violated and, hence, inferences based on REM are affected (Baltagi, 2008).

Figure 02. Scatter plots of AD versus SSM for four randomly selected halls

The next test reported in Table 07 is the Hausman (1978) test which compares REM with FEM. The null hypothesis of the tests is that the unobserved heterogeneity is not correlated with any of the explanatory variable(s) in the model. If the unobserved heterogeneity is found to be correlated with any one regressor in the model, this would imply that REM is problematic (Kennedy, 2003) and, hence, FEM should be preferred. The results of the Hausman test reveal that individual effects are, indeed, correlated with regressors and, therefore, FEM is the preferred model. Besides the stated diagnostic tests to compare pooled OLS, FEM and REM, Kennedy (2003) recommends plotting the dependent variable against different important explanatory variables to eyeball for any cross-sectional

or period differences. Doing this exercise and plotting AD versus SSM with linear regression lines for four randomly selected halls reveal that both slopes and intercepts for the four selected halls differ (figure 02) and hence FEM is the most appropriate estimation method. Last, the Durbin-Wu-Hausman test checks for endogeneity of the two variables: PDI and SSM. Since the null hypothesis of no endogeneity is not rejected in either of the cases, so there is no issue of endogeneity in the model.

Table 08

FE, RE and Pooled OLS Estimates

Variables	FEM	REM	Pooled OLS
PDI	0.2579	-0.0481	-0.1456
PDS	0.2213	0.4857	0.6954**
SSM	-0.0064*	-0.0047**	-0.0044***
SSO	-0.0189*	-0.0218*	-0.0196*
ZY	-0.0033	0.0006	0.0017
G	-0.4016*	0.0124	0.0161*
C	0.2930*	0.0509*	0.0455*
Adj. R-square	0.4344	0.1152	0.1472
Durbin-Watson d	2.2186	2.0858	1.8072
F-Statistics	4.9380*	8.7923*	11.3280*

Note: The steric (*, **, and ***) represent statistical significance at 1%, 5% and 10% respectively. The results reported for FEM are corrected for heteroskedasticity by using White cross-section standard errors and covariances.

Table 08 above reports the main results of the study. Note that the most appropriate model to estimate equation (04), as dictated by the diagnostic tests, is the FEM. The FEM results reported above is a two-way fixed effect model which is also corrected for heteroskedasticity using the White's cross-sections standard errors and covariances. However, the above table also reports results of REM and pooled OLS for checking robustness of the results. Recall that there are two policy (sub-divided into four) variables in the model: probability of detection and severity of punishment. The results given in Table 07 reveal that detection probability has no impact on AD, but severity of punishment and AD are inversely related. The negative impact of sanctions on AD is standard but detection probabilities having no impact on AD is counter-intuitive and needs further elaborations.

Going back to the basics, and as mentioned in endnote 17, the measures used in the analysis of this paper can best be described as objective (as opposed to its subjective counterpart) measures of detection. The relevant measures in the students' cost benefit analysis to cheat may, however, be the subjective or perceived probability of detection. Probability of detection as measured in this work would have the theoretical negative impact on AD if and only if the assumed direct relationship between objective and subjective probability of detection holds. But if it does not, i.e., if increasing the number of proctors or any other such measure does not influence the perceptions of students, then policy actions involving variations in objective detection probability will have no impact on AD.

An overwhelming body of prior empirical research has shown that less than 10 percent of the students who cheated were caught (Diekhoff et al., 1999; Marshal & Varnon, 2017 and Freiburger et al., 2017). Similarly, a huge volume of research speaks of the proctors' reluctance to report detected cases of AD (Coren, 2012 and Sorgo et al., 2015). Such observations lead students to internalize the perceptions that AD is not a serious matter and hence the cost benefit analyses are distorted in favor of AD (Dee & Jacob, 2010; Sattler et al., 2017 and Boyle et al., 2017). Given this, the mere number of increasing the proctors and inspectors to patrol examination centers will not affect the incidence of AD if these numbers are unwilling to detect and report cases of AD. Hence, there seems to be a lack of correspondence between objective and perceived probability of detection, a missing link that constitutes the core of anti-AD policies. The fact that sanctions do have the desired effect on the acts of AD makes the core even more important.

5. CONCLUSION AND POLICY RECOMMENDATIONS

AD with its economy-wide negative consequences is a serious issue, needing immediate and serious attention of all the stakeholders. The traditional policy of controlling AD in Pakistan is, however, based on common sense and has never been rigorously tested for its effectiveness. This study tried to empirically evaluate the efficacy of the conventional policies, i.e., policies based on enforcement of rules, to curb the menace of AD in the institutes of higher learning in Pakistan. To this end, the study makes use of the panel data compiled by a large public sector university in Pakistan and estimated empirical specifications involving probability of detection and severity of sanctions as policy variables while controlling for stacks in conformity and gender. The results reveal that while sanctions do have a negative impact on AD, statistical evidence failed to substantiate the same for detection probability and AD. The study, based on insights obtained from prior empirical research in the field, associated the lack of association between probability of detection and AD to a lack of assumed direct correspondence between objective and perceived probability of detection. These findings have important policy prescriptions for controlling AD in Pakistan (and elsewhere) which are discussed subsequently.

There are mainly two types of policies – not necessarily mutually exclusive –to achieve the goal of academic integrity: enforce academic integrity and/or promote academic integrity (McCabe & Katz, 2009). The first type of policy was the subject of scrutiny of this study and the second type focuses on building character against AD. The findings of this study reveal the fact that conventional policies based on enforcement of rules are not entirely useless. However, it also exposes the weak link in enforcement-based policies, i.e., the lack of correspondence between objective and subjective probabilities that result from reluctance on the part of the authorities responsible to detect and report acts of AD for subsequent actions. To align the objective and subjective probabilities, proctors responsible for policing the examination centers must accept the responsibility of properly monitoring the students and to adopt zero-tolerance policies by reporting all detected acts of AD. Einstein once said, “*setting an example is not the main means of influencing others; it is the only means*” (Whitten & Swank, 2017). Thus, setting examples by reporting all detected acts of AD will enhance the usefulness of the conventional policies through general as well as specific deterrence.

Another important policy recommendation that stems from the findings of this study is the substitutability of policies based on cost effectiveness. Given the recent financial problems of the Higher Education Commission and Universities across Pakistan, educational institutions may find it optimal to enforce sanctions on all the reported cases of AD instead of increasing probability of detection through increasing proctors, inspectors or any other such measure which are both expensive and ineffective. The results obtained in this study further provide the flexibility to the enforcers to either implement monetary sanctions or other sanctions as both types of sanctions influence AD negatively. Monetary sanctions may, however, be preferable to other forms of sanctions due to; a) monetary sanctions can be a source of income for the resource deficient universities, and, b) monetary sanctions do not involve cancellation of exams or expulsion of students and, hence, a greater number of students can be retained which may be one of the core objectives of the universities.

6. LIMITATIONS OF THE STUDY

This study is the first of its type in Pakistan and needs to be replicated in other universities before any generalization can be made. There are, however, some limitations of the present study which need to be addressed in the future research studies. First, the study covers enforcement related variables but none of the variables to account for promoting academic integrity. Recent empirical findings from Pakistan (Ullah, 2018) have revealed that personal sanctions in the form of guilt and shame are important in explaining students' misconduct. The lateral type of variables are more important as enforcement only reduces cheating but inculcating academic integrity can be achieved more through overall development of the students.

Similarly, all the variables included in the empirical specifications are the cost side variables. The data set used is having no variable which can be used as a proxy for the benefits of cheating to have a complete specification. This, however, should not cause any empirical problems, given that the FEM automatically controls omitted variable(s) bias (Baltagi, 2008). Finally, the cross-sectional dimension of the panel is relatively long as compared to the time dimension. In such cases, Baltagi (2008) recommends estimating the "within" effect model. The "within" effect model, however, is also problematic as it suppresses the common intercept and wipes out all time invariant variables (Kennedy, 2003) such as gender. Thus, it is recommended that the future researchers should use panels having long cross-sectional as well as time dimensions.

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